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**Listening to the inner child in social cognition:
The ontogeny of the dual architecture of social information processing**

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ABSTRACT

Studies conducted with children may be highly valuable for the advancement of social cognitive theory testing and building, beyond a strictly developmental scope, and particularly under the framework of the dual-architecture of social information processing. The arguments favouring this thesis are presented through the implementation of 7 studies, grouped in 2 sets. The first set of studies illustrates how research with differently-aged participants (preschoolers to ninth-graders) is useful for testing and informing dual-process theories, such as the three-stage model of person perception (Gilbert, Pelham, & Krull, 1988). Studies 1 and 2 tested, and corroborated, the ontogenetic prediction derived from the model that the situational correction process has a later ontogenetic onset than the dispositional characterization process. Study 3 examined the impact of prior expectancies on the dispositional characterization process, and the ways the obtained results inform the three-stage model were discussed. The second set of studies illustrates how research with children is valuable for gathering knowledge about the operation of the more automatic processes, such as the ones involved in incongruity processing in impression formation settings. Studies 4 and 5 investigated participants' willingness to know more about either a congruently or an incongruently described target-person. Study 6 examined whether participants conceived of a target-person described in incongruent terms as a real person. Finally, Study 7 tested differential recall of expectancy-congruent and incongruent information in 4- to 10-years-old children. Based on these results, hypotheses were generated about the more automatic processing of incongruent information, namely of incongruity-neglect and avoidance.

Key-words: dual-process theories, person perception, dispositional inference, incongruity, children

RESUMO

Estudos com crianças podem ser valiosos para o teste e construção de teorias sócio-cognitivas, para além dum âmbito estritamente desenvolvimentista, particularmente sob o enquadramento da arquitectura dualista do processamento de informação social. Sete estudos, agrupados em 2 conjuntos, servem a apresentação de argumentos a favor desta tese. O primeiro conjunto ilustra a utilidade de investigação com participantes de diferentes idades (pré-escolar até 9º ano) para testar e informar teorias de processamento dualista, como o modelo das três-etapas da percepção social (Gilbert, Pelham, & Krull, 1988). Os Estudos 1 e 2 testaram, e corroboraram, a predição ontogenética derivada do modelo de que a correcção situacional é um processo ontogeneticamente mais tardio do que a caracterização disposicional. O Estudo 3 examinou o impacto das expectativas prévias na caracterização disposicional e discutiu-se o modo como os resultados informam o modelo. O segundo conjunto de estudos ilustra o valor de investigação com crianças na acumulação de conhecimento sobre processos mais automáticos, tais como os envolvidos no processamento de incongruência em contextos de formação de impressões. Os Estudos 4 e 5 investigaram a preferência dos participantes por saber mais sobre uma pessoa-alvo congruente ou incongruente descrita. O Estudo 6 examinou se os participantes concebiam como real uma pessoa-alvo descrita de forma incongruente. Finalmente, o Estudo 7 testou a recordação diferencial de informação congruente e incongruente com expectativas em crianças de 4 a 10 anos. Com base nestes resultados geraram-se hipóteses sobre o processamento mais automático de informação incongruente, nomeadamente sobre negligência e evitação de incongruência.

Palavras-chave: teorias de processamento dualista, percepção de pessoas, inferência disposicional, incongruência, crianças

TABLE OF CONTENTS

General Introduction.....	1
1.1. <i>Goals and Overview.....</i>	4
1.2. <i>Studies with Children Within a Social Cognition Framework.....</i>	8
1.2.1. As a tool to inform theoretical models.....	8
1.2.2. Not because of ecological validity.....	9
1.2.3. Not a developmental psychology enterprise.....	11
1.3. <i>Dualistic Architecture of Social Information Processing.....</i>	12
1.3.1. A brief overview.....	12
1.3.2. The ontogenetic prediction.....	14
1.3.3. Exceptions to the ontogenetic prediction.....	16
1.4. <i>Two Ways of Using Studies with Children.....</i>	17
1.4.1. Theory-to-data.....	17
1.4.2. Data-to-theory.....	18
1.5. <i>Summary.....</i>	19
Part I: Theory-To-Data.....	21
2.1. <i>Part I Overview.....</i>	23
2.2. <i>Theoretical Framework.....</i>	25
2.2.1. Classical attribution theories.....	25
2.2.1.a) Heider.....	26
2.2.1.b) Jones and Davis.....	27
2.2.1.c) Kelley.....	29
2.2.2. The correspondence bias.....	32
2.2.2.a) Empirical demonstrations and definition.....	32
2.2.2.b) Contrasts with the fundamental attribution error.....	34
2.2.2.c) Classical explanations of the correspondence bias.....	35
2.2.3. Information processing models.....	37
2.2.3.a) Quattrone.....	38
2.2.3.b) Trope.....	39
2.2.4. The three-stage model.....	42
2.2.4.a) Composition of the model.....	42
2.2.4.b) Experimental tests of the model.....	45
2.2.5. Alternatives and criticisms to the three-stage model.....	48
2.2.5.a) Alternative explanations of the correspondence bias.....	48
2.2.5.b) Social perceiver's epistemic goal.....	51
2.2.5.c) Cultural differences.....	53
2.2.5.d) Prior expectancies.....	56
2.2.6. Convergent evidence concerning the three-stage model.....	62
2.2.6.a) Dispositional and causal inferences.....	63
2.2.6.b) Spontaneous trait inferences.....	64
2.2.7. Developmental evidence on person perception.....	67
2.2.7.a) Behaviour explanation studies.....	67
2.2.7.b) Free description studies.....	68
2.2.7.c) Behavioural prediction studies.....	69
2.2.7.d) Dispositional inference studies.....	73

2.2.8. Summary and hypothesis.....	76
2.3. <i>Empirical Studies</i>	78
2.3.1. Study 1 – The Sad Child.....	78
2.3.1.a) Method	80
2.3.1.b) Results.....	86
2.3.1.c) Discussion	93
2.3.2. Study 2a – Weekend With a Friend	98
2.3.2.a) Method	100
2.3.2.b) Results.....	104
2.3.2.c) Discussion	109
2.3.3. Study 2b – Weekend With a Friend (Replication).....	111
2.3.3.a) Method	111
2.3.3.b) Results.....	113
2.3.3.c) Discussion	116
2.3.4. Study 3 – Weekend With One’s Best Friend.....	117
2.3.4.a) Method	118
2.3.4.b) Results.....	121
2.3.4.c) Discussion	124
2.3.5. Summary.....	127
2.4. <i>Part I Discussion</i>	128
Part II: Data-To-Theory	135
3.1. <i>Part II Overview</i>	137
3.2. <i>Theoretical Framework</i>	139
3.2.1. Congruency in Personality Impressions.....	140
3.2.1.a) Wholeness and Coherence	141
3.2.1.b) Implicit Theories of Personality.....	143
3.2.1.c) Organisation in Memory	145
3.2.2. Remembering Incongruent Information.....	147
3.2.2.a) Incongruency Effect	147
3.2.2.b) Conditions for The Occurrence of the Incongruency Effect.....	148
3.2.2.c) Person Memory Model and the TRAP Model.....	150
3.2.3. Making Sense of Incongruent Information.....	153
3.2.3.a) Change of Meaning	154
3.2.3.b) Modes of Resolution	155
3.2.3.c) Causal Attribution	157
3.2.4. Inferring Traits Upon Incongruent Information	159
3.2.4.a) Spontaneous Trait Inference.....	159
3.2.4.b) Impression Formation and Person Memory.....	162
3.2.5. Incongruency in Expertise Domains	164
3.2.6. Developmental Evidence on Processing of Incongruent Information	167
3.2.6.a) Free Description Studies	167
3.2.6.b) Person Memory Studies	170
3.2.6.c) Other Domains	174
3.2.7. Summary and Hypothesis.....	177
3.3. <i>Empirical Studies</i>	181
3.3.1. Study 4 – The Kid Who Helps Others and Doesn’t Like to Share	181
3.3.1.a) Method	182
3.3.1.b) Results.....	185
3.3.1.c) Discussion	191
3.3.2. Study 5 – Sitting Away From One’s Best Friend	194

3.3.2.a) Method	196
3.3.2.b) Results.....	199
3.3.2.c) Discussion	209
3.3.3. Study 6 – The Smart and Dumb Kid.....	212
3.3.3.a) Method	214
3.3.3.b) Results.....	217
3.3.3.c) Discussion	229
3.3.4. Study 7 – The Nice Kid who Yelled at Grandma	233
3.3.4.a) Method	235
3.3.4.b) Results.....	238
3.3.4.c) Discussion	248
3.3.5. Summary.....	256
3.4. <i>Part II Discussion</i>	257
General Discussion	263
4.1. <i>Overviews</i>	265
4.1.1. Dissertation Overview.....	265
4.1.2. Goals and Results Overview.....	266
4.2. <i>Contributions</i>	271
4.2.1. Empirical Contributions	271
4.2.2. Theoretical Contributions.....	273
4.2.3. Design Qualities.....	275
4.3. <i>Limitations</i>	277
4.3.1. Methodological Questions.....	277
4.3.2. The Continuity Assumption.....	278
4.3.3. Developmental Questions.....	280
4.4. <i>Future Directions</i>	282
4.4.1. Follow-up studies.....	282
4.4.2. Extension studies	285
4.5. <i>Epilogue</i>	287
References.....	288
Appendices.....	302

LIST OF TABLES

Table 1: Descriptive statistics concerning age (mean, standard deviation, minimum and maximum values) and gender (frequencies and percentages) of Study 1 participants	80
Table 2: Descriptive statistics of the dispositional ratings (means, 95% confidence intervals, and standard deviations) and test statistics with respective p-values and effect sizes for the contrasts between conditions of Study 1	87
Table 3: Descriptive statistics of the behavioural predictions (means, 95% confidence intervals, and standard deviations) and test statistics with respective p-values and effect sizes for the contrasts between conditions of Study 1	91
Table 4: Descriptive statistics of the understanding of situational constraints measure (means, 95% confidence intervals, and standard deviations) according to discussion topic ..	92
Table 5: Descriptive statistics concerning age (mean, standard deviation, minimum and maximum values) and gender (frequencies and percentages) of Study 2a participants	100
Table 6: Descriptive statistics of the dispositional ratings (means, 95% confidence intervals, and standard deviations) and test statistics with respective p-values and effect sizes for the contrasts between conditions in Study 2a	104
Table 7: Frequencies of situational and preference-related aspects and of non-responses invoked as behaviour explanations by participants of Study 2a.....	108
Table 8: Descriptive statistics concerning age (mean, standard deviation, minimum and maximum values) and gender (frequencies and percentages) of Study 2b participants	112
Table 9: Descriptive statistics of the dispositional ratings (means, 95% confidence intervals, and standard deviations) and test statistics with respective p-values and effect sizes for the contrasts between conditions in Study 2b	114
Table 10: Frequencies of situational and preference-related aspects and of non-responses invoked as behavioural explanations by participants of Study 2b.....	115
Table 11: Descriptive statistics concerning age (mean, standard deviation, minimum and maximum values) and gender (frequencies and percentages) of Study 3 participants	119
Table 12: Descriptive statistics of the dispositional ratings (means, 95% confidence intervals, and standard deviations) and test statistics with respective p-values and effect sizes for the contrasts between conditions in Study 3	121
Table 13: Frequencies of situational, behavioural, expectancy- and egalitarianism-related aspects invoked as justifications for the dispositional ratings by participants of Study 3.	124
Table 14: Descriptive statistics concerning age (mean, standard deviation, minimum and maximum values) and gender (frequencies and percentages) of Study 4 participants	183
Table 15: Frequencies of cognitive contact choice with the congruent and incongruent target per grade-level and order of presentation in Study 4.....	187

Table 16: Descriptive statistics of the social contact measure (means, 95% confidence intervals, and standard deviations) and test statistics with respective p-values and effect sizes for the contrasts between targets of Study 4	188
Table 17: Descriptive statistics of the evaluative ratings (means, 95% confidence intervals, and standard deviations) and test statistics with respective p-values and effect sizes for the contrasts between targets of Study 4.....	190
Table 18: Descriptive statistics concerning age (mean, standard deviation, minimum and maximum values) of Study 5 participants.....	196
Table 19: Frequencies of cognitive contact choice with the congruent and incongruent target per grade-level and order of presentation in Study 5.....	201
Table 20: Descriptive statistics of the social contact measure (means, 95% confidence intervals, and standard deviations) and test statistics with respective p-values and effect sizes for the contrasts between targets of Study 5	202
Table 21: Descriptive statistics of the evaluative ratings (means, 95% confidence intervals, and standard deviations) and test statistics with respective p-values and effect sizes for the contrasts between targets of Study 5.....	204
Table 22: Frequencies of strategies (premise denial, situational, dispositional) and of non-responses in the behavioural explanations given by participants of Study 5.	207
Table 23: Descriptive statistics concerning age (mean, standard deviation, minimum and maximum values) and gender (frequencies and percentages) of Study 6 participants	214
Table 24: Frequencies of co-occurrence acceptance per grade-level and test statistics with respective p-values for the overall, linear, and residual association between co-occurrence acceptance and grade-level in Study 6	219
Table 25: Descriptive statistics of the frequency estimates for the co-occurrence of traits (means, 95% confidence intervals, and standard deviations) and test statistics with respective p-values and effect sizes for the contrasts between congruent and incongruent trait pairs in Study 6.....	222
Table 26: Descriptive statistics of the frequency estimates for individual traits (means, 95% confidence intervals, and standard deviations) and test statistics with respective p-values and effect sizes for the contrasts between positive and negative traits in Study 6	225
Table 27: Percentages of participants' explanations coded as literal, segregated, integrated, or uncategorized, along with the percentages of participants who rejected the co-occurrence of traits in Study 6.	227
Table 28: Descriptive statistics concerning age (mean, standard deviation, minimum and maximum values) and gender (frequencies and percentages) of Study 7 participants	235
Table 29: Descriptive statistics of the number of recalled behaviours (means, 95% confidence intervals, and standard deviations) and test statistics with respective p-values and effect sizes for the contrasts between the recall of congruent and incongruent items in Study 7.....	241
Table 30: Descriptive statistics of the preponderance estimates (means, 95% confidence intervals, and standard deviations) in Study 7.....	245

Table 31: Descriptive statistics of the liking ratings (means, 95% confidence intervals, and standard deviations) in Study 7.....	246
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LIST OF FIGURES

Figure 1: Mean dispositional ratings of each grade-level in the two experimental conditions of Study 1.....	88
Figure 2: Mean ratings of the constraints imposed by the two discussion topics by each grade-level.....	93
Figure 3: Mean dispositional ratings of each grade-level in the two experimental conditions of Study 2a.....	106
Figure 4: Mean dispositional ratings of each grade-level in the two experimental conditions of Study 2b.....	114
Figure 5: Mean dispositional ratings of each grade-level in the two experimental conditions of Study 3.....	122
Figure 6: Percentages of cognitive contact choice either with the congruent or the incongruent target for each grade-level in Study 4.....	186
Figure 7: Ratings of the social contact measure (full lines) and evaluative measure (dotted lines) for each grade-level and target in Study 4.....	189
Figure 8: Percentages of cognitive contact choice either with the congruent or the incongruent target for each grade-level in Study 5.....	199
Figure 9: Ratings of the social contact measure (full lines) and evaluative measure (dotted lines) for each grade-level and target in Study 5.....	203
Figure 10: Percentages of co-occurrence acceptance by grade-level for each trait pair in Study 6.....	217
Figure 11: Estimates of the prevalence of people who can be described by the congruent and incongruent pairs of traits of Study 6.....	221
Figure 12: Estimates of the prevalence of people who can be described by the positive and negative traits of Study 6.....	224
Figure 13: Proportion of congruent and incongruent recalled items per age-group and processing goal in Study 7.....	240
Figure 14: Proportion of positive and negative recalled items per age-group and processing goal in Study 7.....	243
Figure 15: Preponderance estimates per age-group and processing goal in Study 7.....	244
Figure 16: Liking ratings per age-group and processing goal in Study 7.....	245
Figure 17: Hypothetical associative networks inspired by the person memory model representing cognitive representations formed under high, moderate, and low cognitive load.....	259

GENERAL INTRODUCTION

These are my principles; if you don't like them, I have others

Groucho Marx

Whenever someone asks me what I have been doing research-wise in these last years, and I mumble something about *social cognition* and *children*, three reactions are most common:

- (1) people do not have a clue what I am talking about (usually a lay person),
- (2) people say “Finally someone recognized that focusing solely on college students in social cognition research is a menace to ecological validity!” (usually a more applied or intergroup-relations oriented social psychologist), or
- (3) people assume I am doing “standard” developmental work (usually all kinds of psychologists).

So, my first concern will be to try to explain, without mumbling and ideally in such a way that even a lay person would understand it, what this dissertation is all about [SECTION 1.1], including goals statement and an overview over the conducted studies. But, exactly because there is not a one and only possible role played by children in psychology research, the role reserved for them in this social cognitive venture is not beforehand obvious (as manifested by the aforementioned reactions). Hence the next section [SECTION 1.2] is devoted to clarifying the moulds of this conjunction (*social cognition* and *children*) by stating how I conceive it, but also how I do not conceive it. After doing so, I will outline the general prediction that, for this research project, defined as worthwhile the study of children within the scope of the dualistic architecture of social information processing [SECTION 1.3]. In the section that closes this chapter you can find a brief description of what divides the two sets of studies that comprise this dissertation [SECTION 1.4]. These two sets of studies are presented in two separate parts of this dissertation, creatively named Part I and Part II [CHAPTERS 2 AND 3], and in each of these parts you can find some theoretical background on the issue under scrutiny, both from a social cognitive as well as from a developmental perspective, the conducted studies and a discussion of the obtained results. In a traditional vein, the final chapter [CHAPTER 4] of the dissertation is devoted to a general discussion.

You are returning home and craving a hug. Upon opening the front door you ask a 3-year-old “Where are you?” and likely he will reply: “I’m here!”. Ask an adult and he should answer “I’m in the kitchen!”, but what I have often heard is “I’m here! In the kitchen!”. This anecdote helps illustrate the starting point of this research project: adults most immediate responses (“I’m here”) may resemble a lot children’s responses, but then they are corrected to attain a more adequate and reasonable answer (“In the kitchen!”, since “I’m here”, apart from the acoustic cues it offers, is poorly informative from the other person’s perspective).

The social cognitive view of the mind as having an underlying dualistic architecture posits that when humans are processing social information, processes that are more automatic and processes that require more cognitive resources come into play. Exactly because one of the modes of processing is defined as more dependent on complex cognitive abilities and in some cases as operating upon the result of the more automatic processing, these more effortful processes should become operational later in the ontogenesis when compared to automatic processing¹. In turn, this means that looking at young children’s responses you should be able to see the automatic processing operating freer from more cognitively demanding processes – you should be able to look at the “I’m here”, while in adults the “I’m here” can be totally occluded by the more reasonable “In the kitchen”.

In the present research project, this ontogenetic prediction was used to achieve two main goals:

- (1) test the validity of a person perception dual-process model in experiments with different age groups (i.e., preschoolers, second-, sixth-, ninth-graders, and undergraduates) [PART I];
- (2) explore children’s responses to incongruity in impression formation settings, in order to generate hypotheses of how adults process incongruity automatically [PART II].

By fulfilling these two goals, the assumed broader aim of this dissertation is to illustrate the potential value and benefits of conducting research with a population rarely studied in a social cognition approach, namely children.

In the studies presented in Part I [CHAPTER 2], a person perception dual-process model—the three-stage model proposed by Gilbert, Pelham, and Krull (1988) – was tested with

¹ There are certainly cases when an initially controlled process is overlearned and becomes automatic. In such cases the ontogenetic acquisition order is reversed. Hence, the formulated prediction applies solely to cases when different processes interplay to perform some task (e.g., when one process monitorizes the other) and not when a process transforms itself [SEE ALSO SECTION 1.3.C].

children. The basic hypothesis was that the more automatic processing should be visible in young children's responses, uncorrected by the more effortful process. Conversely, in older children's responses you should be able to see the correction outcomes.

In Study 1, a *trait* (i.e., sadness) was used as dispositional factor, and the situational constraints (i.e., receiving a gift or a punishment), in which the trait was expressed (i.e., sadness behavioural expression), were manipulated. Younger children (preschoolers), as expected, did not take the situational constraints into account when inferring the dispositional trait. Older children (second- and sixth-graders), adolescents, and adults, on the other hand, all used situational information to adjust their dispositional inferences. These results generally support the model, yet younger children were not drawing inferences that corresponded to the observed behaviour as the model predicted. One possibility was that prior expectancies might be influencing children's inferences.

So, in Study 2, another type of dispositional factor was used, namely an *attitude* (i.e., preference for one of two friends), and the formation of prior expectancies about the actor's true attitude was precluded. In this paradigm, situational constraints (i.e., free-choice or no-choice between friends) were again manipulated while the behaviour was held constant (i.e., statement of joy over visiting one of the friends). As had happened in Study 1, younger children were the only age-group that did not take situational constraints into account, this time demonstrating the correspondence bias (i.e., inferring a disposition correspondent to the behaviour although the actor was situationally constrained to perform that behaviour).

In Study 3, prior expectancies were reintroduced in a paradigm identical to the one of Study 2 (i.e., by implying a prior stronger friendship with one of the friends), in order to explore the role played by such expectancies in the drawing of dispositional inferences in the several age groups. All age groups, including younger children, inferred that the true attitude corresponded to the prior expectancy, even when, in a no-choice scenario, the behaviour did not match that expectancy.

This set of studies supports the validity of the model, but it also points at a possible addition to (or restriction of) the model. In cases where a prior expectancy is available, the social perceiver, just like the younger children in the present studies, may be automatically drawing an inference based on the expectancy, in addition to the one based on behaviour. Exploring further this idea in future research could prove important to social cognition theorizing in the person perception domain.

In the studies presented in Part II [*CHAPTER 3*], the way how children respond to social targets that exhibit some form of incongruency was probed, anticipating that these responses

may be informative to our understanding of how adults respond to incongruency when processing in a more automatic mode.

In Study 4, children of different age groups (preschoolers, second-, sixth-, and ninth-graders) were presented with two targets: one described by evaluatively congruent information (i.e., one positive and two neutral statements) and one described by evaluatively incongruent information (i.e., two positive and one negative statement). While younger children chose more frequently to listen to a story about the congruent target, older children and adolescents preferred the incongruent one. These results may indicate an automatic preference for cognitive contact with congruent material, but a confound between congruence and valence (i.e., the incongruent target's description contained a negative piece of information, while the congruent target's description did not) hampered the interpretation of the results.

So in Study 5, the two used targets were pre-tested to be evaluatively equivalent. One of the targets was descriptively congruent (i.e., sat always next to her friend), while the other was descriptively incongruent (i.e., sometimes sat next to her friend and sometimes not). Once again an age-related linear trend on preference for a story was obtained, whereby younger children more frequently chose the congruent target and adolescents and adults chose the incongruent target. Nevertheless the preference for the congruent target was much more pronounced in second-graders than in preschoolers, who seemed to show some insensitivity to incongruency.

In Study 6, children's and adolescents' responses to incongruency were further explored, this time using pairs of traits. Several pairs of traits were presented to participants, and each pair was judged to be a possible description of a real person or not. In most cases a linear trend, analogous to the aforementioned age-related linear trends, was obtained, with younger children tending to reject the existence of persons described by incongruent pairs of traits and older participants accepting their existence. Among the youngest children, though, there were reasons to believe that a substantial part of the rejection was due to valence- rather than congruency-related aspects.

Finally, in Study 7, preferential recall of expectancy-congruent or incongruent information about a person was tested among 4-, 5-, 7-, and 10-year-olds. Only 10-year-olds who had been instructed to form an impression of the person exhibited a better recall of the incongruent information. The younger age groups did not show recall differences between the two types of information, suggesting that the special treatment given to expectancy-incongruent information in impression formation settings has a rather late ontogenetic onset.

This set of studies raises the possibility that incongruent aspects of a social target may go through unnoticed to an adult social perceiver unless s/he has enough available cognitive resources to recognize the incongruency. Then, additional cognitive resources (and possibly motivation) will be required to resolve the detected incongruency. Future research aimed at testing these ideas could provide increased understanding on impression formation processes.

Closing this dissertation [*CHAPTER 4*], the idea that these two sets of studies serve as evidence of the value of having data from child participants within a social cognition framework more directed at end-state theorizing will be resumed and discussed.

For now, however, let us take a step back and explicate the principles at the origin of this research project.

1.2. STUDIES WITH CHILDREN WITHIN A SOCIAL COGNITION FRAMEWORK

1.2.1. AS A TOOL TO INFORM THEORETICAL MODELS

The idea that an integration between studies from developmental and social psychology would be mutually beneficial is hardly innovative. Ruble and Goodnow (1998), for example, wrote a review on social development for publication in *The Handbook of Social Psychology*, with one of the addressed questions being “the overlaps between social developmental and social psychological approaches and what the two fields might be able to contribute to each other” (p. 776), and they cite earlier consonant claims. Their proposal, however, seems to focus more in some form of complementarity, with each field being able to enlighten the other in its “blind spot” (p. 776), than in full-blown integration.

Two years later, Pomerantz and Newman (2000) outlined a more functional connection between the two fields, pinpointing developmental research as a valuable *tool* both for model testing and model building in social psychology. In the examples given by the authors, it becomes quite clear how developmental data can question the validity of some social psychological theories and how one can derive from developmental data to hypothesise some adult forms of functioning (this point will be resumed at *SECTION 1.4*).

More recently, Dunham and Olson (2008) distilled a bit further the importance of considering cognitive developmental evidence for a sound social cognition theorizing, and expressed it in the contention that “development can not just inform but importantly constrain theories of adult end-state cognition in unique ways” (p. 59).

Basically the cited authors, and the authors that inspired them, caution social cognition researchers against the peril of, when focusing exclusive attention on butterflies, unwittingly believe that caterpillars belong to a different species. However different caterpillars and butterflies may be, there are fundamental continuities between the two life stages. Integrating what is known about both, not only enlarges our knowledge about the species, but it helps as well to rule out what one and the other cannot be.

It must also be acknowledged that there are more than theoretical pleas for collaboration and integration between developmental and social psychology. There are a reasonable number of studies that concretize these pleas (e.g., Lepper, Greene, & Nisbett, 1973; Gilbert, Krull, & Malone, 1990; Epley, Morewedge, & Keysar, 2004; Mata, Schooler,

& Rieskamp, 2007²; Olson, Dunham, Banaji, Spelke, & Dweck, 2008). Nevertheless, many of these studies seem to represent more a fortunate case of integration than a planned use of age related differences to generate or test hypotheses.

Summing up, the present research project, attuned with the mentioned propositions, aims to illustrate how developmental data can be *systematically* used as a *tool* to test (*theory-to-data*) and generate (*data-to-theory*) hypotheses in a social cognition framework [SEE ALSO SECTION 1.4].

Before going on to discuss how this illustration was attempted in the domain of dual-process models of social information processing [SECTION 1.3], I opted to include some remarks on what was *not* intended by conducting studies with children within a social cognition framework. By doing so, I certainly do not mean to lessen the importance of the two considered themes (*ecological validity* and *developmental studies*), but to provide the reader with information that hopefully will be useful for adjusting expectations and understanding choices that were taken along this research journey.

1.2.2. NOT BECAUSE OF ECOLOGICAL VALIDITY

In the social cognition literature the vast majority of studies are conducted with college students as participants. There are a number of very well-known social psychological studies conducted with other subject populations, like the housewives in a changing food habits program (Lewin, 1943), the 12-years-old boys in the Robbers Cave experiment (Sherif, Harvey, White, Hood, & Sherif, 1954) and the cockroaches in a social facilitation study (Zajonc, Heingartner, & Herman, 1969). But all of these studies were conducted before the unfolding of the cognitive revolution. In fact, two of the features of this revolution in the discipline of social psychology have been studies “designed to maximize internal validity, precision, and control at the expense of external validity and mundane realism” (Gilbert, 1998a, p. 104) and making use of laboratory techniques (e.g., reaction time measures). So, it is only natural that the most accessible population to the lab setting, namely college students, would also be the most frequently participating one.

² This particular reference signals that, although the propositions contained in this dissertation focus on earlier periods of development, developmental psychology encompass a lot more than that. From our perspective, aging implications to cognitive and social cognitive theorizing are as important as “growing up” implications.

Sears (1986) was not the first to note that most research in social psychology is done with “college sophomores in the laboratory” (p. 515), but he systematizes and illustrates quite convincingly the risks of generalizing results from such research. Basically, Sears argues that relying heavily on one specific subject population (i.e., late teens) and research site (i.e., academic setting) will bias our knowledge about human functioning, especially because researchers tend to neglect the possibility of such biases.

In spite of being a very important question to bear in mind, it does not concern directly research conducted under a social cognition approach, for at least three interrelated reasons.

- (1) In this approach researchers test theories about human functioning, they do not test subjects. According to the falsifiability principle (Popper, 1963) a “genuine *test* of a theory is an attempt to falsify it” (p. 293) and thus if these theories are refuted by college students, or any other participants, they are invalidated; if not, the theory gains corroborative evidence, but never gets ultimately validated; another angle to tackle this same question is to consider, as Mook (1983) puts it, that theory testing experiments aim to generalize knowledge (theoretical implications), not results per se.
- (2) The experimental method insures only that a causal relation can be established between two concepts. Experimental studies do not inform about the pervasiveness or strength of this relationship in the “real” world (e.g., Mook, 1983; Aronson, Wilson, & Brewer, 1998) and, as such, any form of generalization should be, to say the least, very prudent³.
- (3) Theories in the social cognition tradition concern human basic processes – processes that should be characteristic and universal of the human species (independently, for example, of gender, race or culture). This last point lends itself to some controversy, in the sense that structure and contents may be so intricately intertwined, that these basic processes themselves could vary according to human and environmental circumstances (e.g., Bruner, 1990). Nevertheless, if there are theoretical, empirical, or ethical grounds to suppose that the process under scrutiny is not universal, this can and should be tested (e.g., recurring to cross-cultural studies).

Therefore, although the present research project materializes Sears’ call (1986) for “a greater effort ... to conduct research on persons from life stages other than late adolescence” (p. 527), ecological validity is not the primary goal of the present work. In contrast, it is being

³ The blatant statement that in theory testing experiments, generalization of the data to the population is never an option, can seem odd at first sight. But generalization to a population, even in studies with a high level of ecological validity, neglects one basic assumption of the statistic inference methods researchers so ubiquitously use, namely that the population is merely hypothetical (unreal), or in Louçã’s (2008) words “...Fisher imposed the notion of data as being drawn from an infinite and therefore imagined population as the condition for statistical inference from an experiment” (p. 13; see also e.g., Gigerenzer, 2004).

argued for the importance of studying other age groups as a tool to refute or corroborate theories about social cognitive processes and/or to disentangle the operation of such processes.

1.2.3. NOT A DEVELOPMENTAL PSYCHOLOGY ENTERPRISE

This second point is trickier. In fact, the two sets of studies to be presented here can be seen as developmental research, in the sense that they reveal changes or differences across age groups (from preschool children to adolescents). However, these studies were not designed to uncover the developmental variables and/or developmental mechanisms underlying these changes. No measures from the developmental psychology literature (e.g., multiple classification tasks) were used, because questions such as the mediating role of competences that develop with age were not relevant to the present hypotheses or theories. In this research project the interest relied on what the age related differences could tell us about social information processing in a fully developed cognitive apparatus. *Age* was treated as a non-manipulated independent variable, alongside with other *true* independent variables, to test model predictions [CHAPTER 2] and to generate hypotheses [CHAPTER 3] about automatic processing.

This is not to say that the age differences uncovered are not interesting by themselves or to deny the relevance of follow-up studies conducted with developmental psychology questions in mind – it only states that the current project was not conducted to answer questions that typically concern developmental psychology.

For its part, the present project was carried out in the domain of dual-process models of social information processing, because such models are fairly central in the social cognition literature and they render some ontogenetic predictions rather probable [SEE SECTION 1.3.2], if not quite straightforward in some particular cases. Thus I next provide a brief overview on social cognitive dual-process models.

1.3. DUALISTIC ARCHITECTURE OF SOCIAL INFORMATION PROCESSING

1.3.1. A BRIEF OVERVIEW

Occasionally an attractive person will make you do things that otherwise you would not do, and I am not referring to the romantic sphere. Advertising and marketing people use this feature constantly. However, you know that the attractiveness of someone remotely linked to some product should not influence your buying decision, and so, some other times, an attractive person will not be enough to persuade you.

A lot of discrepancies like this one (i.e., participants behaving in very different ways depending on the circumstances) are documented in the literature (e.g., Petty & Cacioppo, 1979; Gilbert, Pelham, & Krull, 1988; Wegner & Erber, 1992). An even stronger case of discrepancy, namely when someone subjectively feels the simultaneous tendency to respond in two different ways (e.g., the odds that Linda is just a bank teller are logically greater, but from the description one could bet she is a feminist bank-teller; Tversky & Kahneman, 1983), was taken by Sloman (1996) as irrefutable evidence that the mind is not unitary. A dualistic architecture of information processing, though, can easily account for such apparent discrepancies, by assuming that two different forms of processing come into play in producing some response, and that each one of these forms of processing can be favoured or hindered (to different degrees) by motivational, cognitive, informational, emotional, among others, circumstances.

A wide range of dual-process models have been proposed in the social cognitive literature (see e.g., Chaiken & Trope, 1999)⁴, encompassing many areas of study, including attitudes (Fazio, 1990), persuasion (Petty & Cacioppo, 1986), stereotyping (Devine, 1989), impression formation (Fiske & Neuberg, 1990), person memory (L. Garcia-Marques & Hamilton, 1996), and judgement and decision making (Kahneman & Frederick, 2002), to name just a few. Each one of these models has its own specificities, and these should be acknowledged, but hopefully it does not distort the theories that much to contemplate how the two processing modes across theories have substantially overlapping characteristics. Previous reviews (e.g., Evans, 2008; Smith & DeCoster, 2000; T. Garcia-Marques, 1999) have characterized one of the processing modes as more (1) effortless, quick, pre-conscious,

⁴ This exposition focus deliberately on social cognition literature, but it should be noted that dual-process models had a parallel development in cognitive psychology

spontaneous, implicit, automatic, non-analytical, association-based, reproductive, based on a slow learning system, and the other mode as more (2) effortful, slow, conscious, intentional, explicit, controlled, analytical, rule-based, productive, based on a fast learning system.

Some variables have been consistently identified in the literature as having the potential to favour (or to constitute necessary condition for) one or the other of these processes. Motivation, capacity, familiarity, and affective state are some of the more discussed ones (e.g., Chaiken & Trope, 1999) and so it is not surprising that, whenever one wants to experimentally disentangle the two modes, one will use manipulations that impact these variables (e.g., respectively, personal relevance, cognitive overload, informational match/mismatch, mood). Another way to disentangle the two modes of processing will soon be put forward in this dissertation [SECTION 1.3.2], based on their general, above mentioned, characteristics.

Dual-process models vary somewhat on the assumptions how the processes are implemented and how one process⁵ (and respective output) relates to the other (see e.g., T. Garcia-Marques, 1999; Gilbert, 1999). Generally, processes can be assumed to flow dependently or independently from each other and they can be construed as having an inhibitory, biasing, suppressive, or additive influence on each others outputs (using T. Garcia-Marques' terminology), according to if the model follows a selective, corrective, competitive, or consolidative design (using Gilbert's terminology)⁶. This basically means that the more automatic process can be conceptualized as always preceding (usually the case in the corrective design), running in parallel (consolidative and competitive designs) or taking turns (selective design) with the more deliberate process. Once the more automatic process is also (generally) conceived as being faster and pre-conscious, it is improbable that any model will assume its activation to occur later than the more deliberate process for the completion of the same task⁷. This design feature, along with the above mentioned general characteristics of

⁵ When the word "process" is used in the singular form along the text, I mean that "mode of processing"; I do not mean to imply that different processes within that same mode constitute a single "process".

⁶ Some authors (e.g., T. Garcia-Marques, 1999) distinguish between dual-process and dual-stage models. Although this distinction is very helpful to keep in mind the differences between the two, for the present purposes I do not consider strictly necessary to create a strong divide between the two. Dual-stage models usually share with the other models the idea that one of the processes (here the first) is intuitive, faster and more efficient and that the other process (here the second) is less efficient. The main difference relies on the fact that dual-stage models postulate a sequential activation of processes and the corrective influence of the second process upon the output of the first.

⁷ This must be conceived as a theoretical possibility in models that assume independence of activation between the two processes. These models are rather rare in social cognitive literature, though. For cases of automatization of processes, please refer to SECTION 1.3.C.

each process, grants additional plausibility for one specific ontogenetic prediction (to be detailed in the next section).

1.3.2. THE ONTOGENETIC PREDICTION

In dual-process models with the characteristics outlined above, it derives quite legitimately that the more deliberate process should not have an ontogenetic earlier onset than the more automatic one. Naturally, this prediction is not indiscriminately suitable (for some foreseen exceptions see *SECTION 1.3.3*), but it can be considered as highly plausible⁸. If a process is characterized as being able to run with relative independence from available cognitive resources (and complex cognitive abilities), based on such a simple mechanism (i.e., associations) that even other life forms use it, and as usually functionally preceding the other type of process, there are solid grounds to believe it will also ontogenetically precede (or at least not follow) a process that is dependent on cognitive capacity and motivation, based on the application of some rule or on symbol manipulation, and that is often conceptualized as having a monitoring and/or corrective influence onto the previous one. In fact, this ontogenetic prediction acquires a status of logical necessity in the case of dual-stage models, once the more deliberate process is conceived as operating on the output of the more automatic one. Should the more deliberate process develop earlier, there would be virtually no output to operate on.

It must be acknowledged that Pomerantz and Newman (2000), cited above for outlining themes in which developmental evidence could profit social psychology, had already singled out the *automaticity* theme. Infants' and young children's initial responses, they argue, insofar as they "are not influenced by the development of cognitive abilities or socialization pressures" (p. 304; i.e., are efficient and uncorrected), can persist during the lifespan as automatic responses.

Underlying this idea there is an assumption of continuity of information processing modes between childhood and adulthood. Even though one cannot generically guarantee the veracity of this assumption, there are substantial reasons for subscribing it. The history of evolution, for instance, is made of new functionalities and designs that slowly evolve from

⁸ This prediction is also inline with the characterization of the more associative processes as having a longer evolutionary history than the more rule-based ones. However such a characterization in its simpler form is far from being consensual (see Evans, 2008).

primordial systems. Evolutionary discontinuities are rather molecular when compared with the continuities. Hence, it would be quite surprising if a process or system operating during childhood would abruptly metamorphose. Even in Piaget's theorizing (see e.g., Lourenço, 1997), where the qualitative discontinuity between reasoning forms of one and the other stage is a key concept, the idea of continuity is clearly admitted. Development is seen as being brought about by "transformation and enrichment, more than...by substitution and loss" (Lourenço, p. 38, my translation) and the difference between structural (i.e., the highest form of reasoning that the individual is capable of) and functional (i.e., how the individual reasons in a given situation) developmental levels was contemplated. More recently, some authors, notably Gilbert (1998a, 2002; Gilbert & Gill, 2000), proposed a generalized *correction model* and presented data in its support. Basically, it was suggested that the major characteristics of childish forms of reasoning (e.g., *egocentrism* in Piaget's terminology and *realism* in Gilbert's terminology) persist during adulthood, but are very quickly and often successfully corrected. Besides the large number of phenomena identified in the literature that may have their roots in such an anchoring and adjustment process (see e.g., Epley, Keysar, Van Boven, & Gilovich, 2004), an exemplary study, whose results support the *correction model*, was carried out by Epley, Morewedge, and Keysar (2004). Using eye-tracking methods, these authors uncovered that adults' first responses in a perspective taking task are identical to children's responses, although their final outputs are naturally distinct. Dunham and Olson (2008), referring to this same study, emphasized that it "challenges an initial conception of a developmental decline in egocentrism, revealing instead stable egocentrism coupled with the rise of an ever more powerful system of executive control" (p. 61).

The idea that there is an underlying continuity in more automatic information processing mechanisms and that qualitative differences between child and adult forms of reasoning may come about due to the operation of monitoring components is, therefore, not completely original. What can be considered innovative in the present project is the use of this feature as a tool to test dual-process models or to obtain insights about the nature of the more automatic processes running at a given situation.

1.3.3. EXCEPTIONS TO THE ONTOGENETIC PREDICTION

However reasonable this prediction may be, it should not be assumed that it is valid in every instance. There are some exceptions that can already be expected and certainly some others can arise.

As hinted before, the validity of the formulated ontogenetic prediction is clearer when applied to models that assume that the more deliberate process corrects, or acts upon, the output of the more automatic process. In the case of selective or independent designs, the ontogenetic prediction remains conceivably plausible, but its application should be carefully examined, jointly with other specificities of that particular model.

Pomerantz and Newman (2000) called into attention another possible exception, namely when another process overrides the initial one, by virtue of being overlearned (or proceduralized in Anderson's terminology; e.g., Neves & Anderson, 1981).

A related matter concerns different meanings of *automaticity*. This ontogenetic prediction was outlined with reference to automaticity as in processes with high levels of *fluency* (e.g., evaluating something beautiful as good) and not as processes that have been *automatized* by practice (e.g., tying your shoes). If, on one hand, the repeated practice (intentional or not) of a certain process is sufficient to automatize it (e.g., Neves & Anderson, 1981; Bargh & Chartrand, 1999), then it is probable that a lot of children's initial response modes become automatized, exactly because, being ontogenetically earlier, they have a longer application history than, say, later response modes. In this case the formulated ontogenetic prediction would still hold. But on the other hand, if a given response is not fluent in childhood, "initially being memorized and applied in a slow and halting fashion ... [before it becomes] fast and automatic through practice" (Neves & Anderson, 1981, p. 57), then there is plenty of room for other influences (e.g., cultural, educational) to come into play, and the application of the ontogenetic prediction is not so clear.

One last caution remark relates to newborns' and infants' repertoire. In the last century, newborns ceased to be considered as helpless organisms to be viewed as detainers of a substantial set of abilities (e.g., Sigelman & Rider, 2008), including behavioural control in response to the environment (e.g., Brazelton & Nugent, 1995). This note hopefully helps to clarify that, with the previously presented ontogenetic prediction, it is not intended to imply that only automatic behaviour can be innate.

1.4. TWO WAYS OF USING STUDIES WITH CHILDREN

The ontogenetic prediction outlined above [SECTION 1.3.2] can readily be explored in two major types of psychological scientific inquiry, here named *theory-to-data* and *data-to-theory* pathways. In this section I will briefly describe how this twofold approach that underlies the division of this dissertation in two distinct parts was conceptualized.

Ultimately, at the origin of each theory there are observation data. Chow (1992), for example, refers to this type of data as *prior* data. This kind of data has the power to inspire theories, but logically cannot be taken as critical evidence in favour of the theory it helped to create, or otherwise a tautology would arise. It then becomes essential to derive new hypotheses from the theory and test them. Data collected to test these new hypotheses can be referred to as *evidential* data (Chow, 1992) and have the power to either corroborate or refute a given theory. It is also possible that from the inspection of these new data, some other patterns emerge and that they, in turn, inspire new theories, closing the circle. Therefore it was considered of great utility to attend carefully both to hypothesis-testing data (*theory-to-data*) and hypothesis-generating data (*data-to-theory*).

As mentioned before [SECTION 1.2.1], some authors had already sustained that developmental evidence could be valuable for model testing (*theory-to-data*) and model building (*data-to-theory*) in social psychology, but the studies they cite only partially, and often rather incidentally, demonstrate this point. With the two sets of studies, carried out in the scope of the present research project, it was intended, on the one hand, to illustrate the potentialities of using different age groups in dual-process models research and, on the other hand, to show how adequate this tool can be in any stage of this fundamental circular movement between data and theory.

1.4.1. THEORY-TO-DATA

Theory-to-data studies are mainstream studies in social cognitive literature. From a given theory, in this case a dual-process model, some prediction is derived. In the present case, this prediction is an ontogenetic one [SECTION 1.3.2] and it states that the more automatic process should ontogenetically precede the more deliberate process. If for that given model this prediction proves to be true, it would represent corroborative evidence for the validity of

the model. Should the more automatic process have a later ontogenetic onset, on the other hand, then it would signal, at least, a need for revision of the model.

Hence, the first set of studies [*CHAPTER 2*] was designed to put a person perception dual model up to test, having children (of different age groups) as experimental participants.

1.4.2. DATA-TO-THEORY

Data-to-theory studies, on the other hand, have a less good reputation in social cognitive literature and if one imagines them as merely descriptive and blatantly atheoretical studies, than this reputation is somewhat justified. The present proposal, though, does not fit this image. Using the ontogenetic prediction outlined earlier, the second set of studies seeks to illustrate how looking in at children's responses can elucidate researchers about the nature of automatic processes, precisely because it is theoretically admitted that automatic processing outputs may be more exposed at childhood.

The interest of studying the nature of automatic processes operating in the human social cognitive system becomes larger as one concedes that (a) they execute a great bulk of the daily cognitive tasks (Bargh & Chartrand, 1999), that (b), in spite of being indispensable for cognitive survival in a complex social world, they constitute paradoxically powerful sources of "mental contamination" (Wilson & Brekke, 1994, p. 117), and that (c) it is harder to access their functioning via introspection, compared to more deliberate processes.

As mentioned before [*SECTION 1.3.1*], researchers devised a handful of ingenious ways to access automatic processing outputs, ranging from diminishing capacity to undermining motivation. Looking at children's performances may prove to be another promising avenue, as they should be freer from (a) the action of more deliberate processes, (b) plausibility constraints, which frequently lead adults to change their first response tendencies (Kunda, 1990), (c) social desirability biases, and (d) hypothesis guessing attempts.

Thus, the second set of studies [*CHAPTER 3*] was aimed at gaining some insights on children's responses to incongruency in the impression formation domain, from which subsequently one could go on testing if they correspond to adults' corrected automatic responses to the same kind of stimuli.

Summing up, the decision to look in on children's responses in social cognition study areas was taken because (1) developmental data can be used as a tool to inform and constrain theorizing in social cognition, but not as a means (2) to strive for added ecological validity, (3) or to gain insights on developmental processes and variables. Dual-process models offer themselves as a privileged illustration area, since (4) more automatic processes (because they tend to be more efficient in nature and/or because they provide the output for the more controlled ones) should ontogenetically precede more deliberate processes. It is thus reasonable to (5) put dual-process models to the ontogenetic test and to (6) lay out hypotheses of how the individual is functioning at a more basal level, based on children's responses.

The stage is now set for considering, first, how a social cognitive model on person perception can be put to test by ... children.

PART I: THEORY-TO-DATA

Adults are obsolete children

Dr. Seuss

The driver ahead of you is blocking the traffic lane. There he goes for his third back-and-forth attempt at parallel parking. From where you are, you can see the tiny parking spot, but still you feel the almost inescapable urge to exclaim: “C’mon... Gee, what a lousy driver!”

In the person perception literature, the three-stage model authored by Gilbert, Pelham, and Krull (1988) parsimoniously explains why you do not feel half the urge to exclaim: “C’mon... Gee, I’m not sure how good a driver you are, because the size of that parking spot is enough to account for your manoeuvres”. In the present research project, this model was chosen to pursue the stated goal of illustrating the interest of conducting research with children to test the validity of social cognitive dual-process models [SEE CHAPTER 1]. Three main reasons underlie this choice:

- (1) The three-stage model of person perception is a largely accepted model in the social psychology literature, having gathered a lot of empirical support, resisted criticisms, and enjoyed convergence with other research areas [SEE SECTION 2.2];
- (2) For this model (and generally any model) to be considered valid, it should not only be able to explain and predict adult functioning, but it should also encompass the understanding of differential performances across the life span (or at least it should not be at odds with developmental findings) [SEE SECTION 1.2.1];
- (3) The ontogenetic prediction for dual-process models outlined in the preceding chapter [SECTION 1.3.2], namely that automatic forms of processing in adults should have an earlier ontogenetic onset than more deliberate forms of processing, can be derived from this specific model with high levels of confidence, in that the model assumes that the more deliberate process operates upon (i.e., corrects) the output of the more automatic process.

The first part of this chapter [SECTION 2.2], thus, supplies the reader with some theoretical and empirical background of the model (focusing on the main question it addressed), and with some findings originating from developmental psychology that relate to the model constructs. In the following section [SECTION 2.3] three studies conducted in this framework will be presented. The two first studies are direct tests of the model, using two different paradigms and two different operationalizations of the model constructs. The third study aims to explore the role played by one variable that, although not explicitly proposed in

the original model, might have influenced participants' answers in the first study and may constitute a potentially interesting variable to integrate in the model. Closing the chapter [SECTION 2.4], the implications of the results of this set of studies concerning the validity of the model will be discussed and some future research avenues will be outlined.

The three-stage model of person perception (Gilbert, Pelham et al., 1988) is a dispositional inference model, which basically posits that upon the observation of a behaviour, the social perceiver will usually infer that the actor of the behaviour has a dispositional characteristic that corresponds to the behaviour, and only after this inference has been drawn, does s/he consider the situational factors that might have influenced the behaviour.⁹ This model could then provide an explanation for the correspondence bias¹⁰ and integrate diverse well-studied constructs, like the anchoring and adjustment heuristic, spontaneous trait inferences, and the discounting principle. These combined features of having a high descriptive, explanatory, and integrative value are plausibly at the root of the pervasive and longstanding acceptance that this theory has enjoyed in social psychology literature.

In order to better appreciate how the model came to a central position in person perception literature, the questions it helped to settle and the bridges it establishes with other theories and study domains, some historical contextualization follows. This contextualization will focus on: (a) classical attribution theories as the predecessors of information processing models (like the three-stage model itself) [SECTION 2.2.1], (b) the correspondence bias as the problem that refuted classical attribution assumptions and instigated the creation of the three-stage model [SECTION 2.2.2], and on (c) information processing models as the predecessors and building blocks of the three-stage model [SECTION 2.2.3].

2.2.1. CLASSICAL ATTRIBUTION THEORIES

Skipping directly from the classical era when the Latin poet Vergil wrote “Felix qui potuit rerum cognoscere causas (Happy [is s/he] who is able to know the causes of things)” to the classical approach to causal attribution in social psychology, one author stands out as being at the origin of the theoretical development of causal attribution and trait inference research, namely Heider (e.g., Garcia-Marques & Garcia-Marques, 2006; Gilbert, 1998a; Malle, 2004).

⁹ For a more complete description of the model, please refer to section 2.2.4.

¹⁰ For alternative explanations of the correspondence bias, please refer to section 2.2.5.

2.2.1.A) HEIDER

Heider conceived that just like *perception* is fundamental for navigating in the world (and for parking a car), so too is *person perception* vital for living in a social world (and for deciding whether or not to accept a ride from the insecure driver). One of Heider's central ideas was, precisely, that the principles underlying person perception are analogous to the ones underlying object perception (e.g., Heider, 1944).

In a book of paramount importance in social psychology literature, Heider (1958) laid out the principles of this naïve psychology, performed by each social perceiver, in order to be able to understand and predict the acts of others. According to Heider's theorising, one of the most relevant distinctions that the social perceiver has to accomplish is whether a certain act (e.g., bumping into another car while parking) was caused intentionally by the person (e.g., to take most advantage of the available parking space) or whether that was not the case (e.g., malfunction of the brakes). This distinction between *personal* (i.e., intended act) and *impersonal causality* (i.e., unintended act) is logically important, in the sense that only the former should warrant the perceiver to infer a stable disposition of the actor (i.e., a trait, an attitude, a motive, a goal, to name just a few dispositional factors; e.g., the driver's rudeness).

Heider (1958) also suggested that the social perceiver, in his or her quest for meaning, will try to attribute a certain act to a source. Usually, however, there are a number of different forces, both *personal* and *situational* (e.g., driving ability, effort applied at parking, size of the parking spot, chance), that interact in intricate ways to produce acts. Thus, Heider reasoned that the social perceiver must proceed as a scientist (albeit not explicitly) in order to isolate causes and infer dispositional factors.

Both the concept of *intentionality*, as a precondition to infer an actor's disposition, and the perceiver's vocation to consider the interplay between *personal* and *impersonal* forces while trying to attribute a cause to an act, are central ideas in Heider's theorising that were further developed by other authors (Jones & Davis, 1965; Kelley, 1967, respectively), and whose models can be categorized, as well, as *classical attribution theories*.

But before going on to describe these other models, it is interesting to note that Heider (1944) contemplated the tendency of the social perceiver to unwarrantedly assign personal causes to acts. Heider identified the human inclination for taking *agency* as an equivalent of causality, and in that sense "animate beings, especially persons, are the prototype of origins" (p. 359) or "absolute causal origins" (p. 361), in as much as people, conversely to objects,

often initiate behaviour (e.g., decide to park the car) without needing an external transmission of energy as in the case of objects (e.g., the car being towed to a parking lot). In fact, Heider and Simmel (1944) proposed that this association that perceivers establish between animated beings and the origin of an act is bi-directional, meaning that origins of acts (e.g., motion) could be perceived as being animated and as possessing intentions.¹¹ In an exception to Heider's stated scarcity of empirical work, Heider and Simmel (1944) conducted three experiments using a moving picture film, featuring three geometrical figures moving around the screen. Virtually all subjects described the film "in terms of actions of animated beings, chiefly of persons" (p. 259) and the authors suggested that, precisely because of this result, this methodology would be appropriate for studying principles of person perception, while reducing the complexities inherent to using real persons as experimental stimuli. This is to say that Heider (1944; 1958) devoted a substantial part of his theorising to the idea that act and person form a causal unit, integrating many other authors' contributions (e.g., Piaget's animism or Fauconnet's views of responsibility) and illustrating the phenomenon from various perspectives.

2.2.1.B) JONES AND DAVIS

The influence of Heider's work and ideas proved to be limitless (e.g., Gilbert, 1998a). One tip of the iceberg is the theory of correspondent inferences by Jones and Davis (1965), one of the theoretical hallmarks of the study field of dispositional inference (Garcia-Marques & Garcia-Marques, 2006). Jones and Davis (1965) proposed that, for an inference "from acts to dispositions" (p. 219) to be drawn, the perceiver would have to be convinced that the act was not a product of situational forces (e.g., momentary poor performance of the brakes cannot inform us about a driver's characteristic).

In fact, these authors suggested that for a disposition to be inferred, an intention (conscious or not) would have to be assigned to the actor. This assignment of an intention would only be (logically) possible if two preconditions were met, namely (a) if the perceiver assumed that the actor knew a priori the consequences of his/her act (e.g., he knows that he can get most advantage of the parking space if he just lets his car touch the bumper of the

¹¹ Consistent with this idea, current developmental research has identified *agency* as one of the core knowledge systems (e.g., Spelke & Kinzler, 2007). Moreover, one of the features that facilitate infants to recognize an object as an agent is self-propelled motion (e.g., Premack, 1990).

other car and he also knows the bumpers can get scratched at the process), and (b) if the perceiver believed that the actor was able to perform the act (e.g., usually drivers control the car brakes quite well). The assumptions of *knowledge* and *ability* would thus allow the perceiver to establish that the consequences of the act were not accidental, but intentionally desired, tolerated, and/or not avoided.

A substantial part of Jones and Davis' paper (1965) was devoted to the analysis of how the perceiver could, then, derive the actor's intention from the consequences of his/her act, and two major principles were outlined: (1) assumed desirability of the effects, and (2) consideration of effects commonality. The first principle states that a perceiver will generally infer the intention based on a desirable effect (e.g., space gained to manoeuvre) and not on an undesirable one (e.g., scratch on the bumper of the car). The authors discuss some important issues concerning this principle, like its proneness to ethnocentric perspectives of desirability¹² and its lack of informativeness when one or more of the effects are extensively desirable, but its validity seems quite intuitive. The second principle enables the perceiver to extract more specific information about the potential intention by comparing action alternatives, which in the simplest case can mean comparing between the effects of having performed the action (e.g., touching bumpers while parking) with the virtual effects of not having performed it (e.g., getting close without touching bumpers). Effects that are common to the performed act and to another alternative (e.g., time consumed with the manoeuvre) are considered tolerated consequences. Non-common effects specific to the alternative action(s) (e.g., protection of the cars) are taken as avoided, and non-common effects specific to the performed action (e.g., gain of maximum room for manoeuvre at the expense of potential damage to the cars) are seen as desired and revealing of the actor's intention. This principle of non-common effects has a solid logical appeal, but its cognitive implementation in the daily life would imply constant counterfactual reasoning (Garcia-Marques & Garcia-Marques, 2006) and high levels of resource consumption.

Still, according to Jones and Davis' theory (1965), after having assigned an intention to the actor and having inferred its content, the perceiver can move on to infer a yet more stable attribute of the actor, namely a disposition. The authors are quite clear in considering that this inference will be correspondent (i.e., that the act will be revealing of the disposition) only in those cases, when the actor had freedom of choice, and when s/he acted "out of the

¹² In fact, the desirability of the action itself can vary culturally. To name just an example, in Lisbon this kind of behaviour while parking is quite well tolerated (and has even a specific designation, namely *parking by ear*), which is not at all the case in other areas of the country (e.g., Madeira), where it is regarded as totally unacceptable.

ordinary – somehow more intense and noteworthy than we would normally expect” (p. 224). Fully correspondent inferences, in Jones and Davis’ terms, occur thus only when the setting is not constraining the action and when the action defies role expectancies or social desirability. A driver whose intention while parking is to gain the maximum possible room to manoeuvre does not seem to be dispositionally different from any other driver. But the driver who maintains this intention at the expense of the welfare of others’ property seems to be as rude as his act of bumping into another car.

Just like Heider (1958) had proposed that social perceivers only infer personal dispositions of the actor if they first attribute the act to personal causation, so too did Jones and Davis (1965) assume that a correspondent inference will not be drawn if the act was caused by the situation (e.g., the parking spot was too small) or unintentionally by the actor (e.g., the brake pedal slipped). On the other hand, just like Heider had acknowledged a tendency of the social perceiver to attribute personal causation, so did Jones and Davis discuss some special cases when the tendency to draw correspondent inferences would be exacerbated. These cases refer to when the actor’s action has hedonic relevance to the perceiver (“Hey, you brute, that car that you just bumped into is mine!”) or when the perceiver believes that the actor meant to benefit or harm him/her (“You knew that that is my car. You’re such a bully!”). Later, and again on the easiness with which social perceivers infer personal dispositions from acts, Jones (1979) would write: “The road to our understanding of attributional vicissitudes is indeed rocky, but when we think in terms of the attributor, the cognitive road from acts to dispositions is perhaps not as rocky as it should be” (p. 107).

2.2.1.C) KELLEY

Another author who was concerned with attributional vicissitudes was Kelley, and his covariation model (Kelley, 1967) and causal schemata (Kelley, 1973) compose another tip of the massive Heiderian influences iceberg. Kelley’s theorising expand on Heider’s (1958) distinction between personal and situational causes and on the analogy of the social perceiver as an intuitive scientist, alert to *covariation* and *configuration* of information in his/her environment. While Jones and Davis’ theory (1965) focuses on *dispositional* inferences in personal causation scenarios (with intention being a central concept, which distinguishes between personal and impersonal causation), Kelley’s theory (1967) focuses on *causal* inferences (or how the perceiver attributes a certain locus of causality to the event).

In Kelley's (1967) ANOVA analogue model, the covariation principle rules the perceiver's conclusions. This attributional theory proposes that, in most situations when the perceiver has access to multiple observations, s/he will attribute the cause of a certain event to one of three main types of causes, or to some interaction between them, according to which type the effect covaries with. The three types of causes, in Kelley's terminology (1967), are: (a) *persons* (e.g., that driver always bumps into other parked cars, while other drivers do not – ergo, the driver must be disrespectful of others' property), (b) *entities* (e.g., that parked car gets always bumped into, not just by that driver – ergo, the car must have an unusually prominent bumper), and (c) *times* or *circumstances* (e.g., that driver never bumps into other parked cars and that parked car never gets bumped – ergo, the brakes must have momentarily failed). Closely related to these three types of possible causes, Kelley discusses three criteria that support not only the attributer's social and self perception, but also the attributer's confidence in the validity of her/his conclusions, namely (a) *consensus* – how similar is the response of other people to the same entity, (b) *distinctiveness* – how different is the response to this specific entity compared to other entities, and (c) *consistency* – how similar is the response across time and circumstances.

After the presentation of the ANOVA model, and while recognizing that it “is undoubtedly somewhat on the idealized side” (Kelley, 1973, p. 113), Kelley introduces some more theoretical proposals, which would operate when enough information is simply not present or when “the time and the motivation necessary to make multiple observations” is lacking (p. 113), providing an “economical and fast attributional analysis” (Kelley, 1972, p. 152).¹³ Whenever the perceiver has information from just one observation, Kelley (1973) theorises, s/he will use previously gathered information (e.g., expectancies, informally or formally learned knowledge, stereotypes) to make sense of the new piece of information. The perceiver will achieve this by selecting and fitting the data into one out of many stored *causal schemata* (e.g., multiple sufficient causes, compensatory causes, multiple necessary causes) and thus to an assumed pattern of data, which in turn renders the information interpretable in terms of probable causes. Besides the causal schemata, Kelley also proposes that the social perceiver will apply an important attributional rule, namely the *discounting principle*. This principle basically states that when there are multiple plausible causes, the role played by one

¹³ It is interesting to note the similarities between Kelley's pioneering proposals (1973) for “the processes of causal attribution” (p. 107) and the more contemporary dual process theories, namely regarding operation conditions for one or the other process (i.e., information availability, cognitive resources/time, and motivation) and characteristics of the two kinds of processes (i.e., essentially data-driven and demanding or essentially schema-driven, economical, and fast).

of them will be attenuated (e.g., “He may not care about the other parked cars, but maybe he just did not realize that the other car was so near, I don’t know”).

CLASSICAL ATTRIBUTION THEORIES

Heider’s (1958), Jones and Davis’ (1965), and Kelley’s (1967; 1973) theories were ground breaking in social psychology literature and promoted a lot of empirical work. Although these three theories do not exhaust the theoretical proposals that can be labelled as classical attribution theories, they share some features that render them good exemplars of the classical approach. In some way, these authors meant to describe how people ordinarily attribute causes – *naïve psychology* in Heider’s terms -, but the models they outlined are closer to formal rules of how people *should logically* attribute causes (i.e., prescriptive models) than to underlying rules of *how* people *actually* attribute them (i.e., descriptive models). Moreover, the algorithms that supposedly support these attributional inferences were, in general, thought of as rather cognitively complex and demanding (e.g., the calculus of effects commonality), and an accuracy motivation was usually taken as default.

The authors were not at all oblivious of these questions and, as noted before, Jones and Davis (1965) discussed, for example, the role of other motivations (e.g., when personal relevance is involved) and vacillated between thinking of their own theory in prescriptive or descriptive terms (Garcia-Marques & Garcia-Marques, 2006). Kelley (1973), in turn, clearly outlined these questions and introduced the causal schemata as more plausible cognitive algorithms for daily purposes, whose selection and application would depend, not only on informational configuration, but also on different types of motivation. Nevertheless, the idea of a repertoire of discrete causal schemata and of various choice criteria is not yet completely parsimonious.

Still, one of the more distinctive features of the classical attribution theories relies in their assumption that the social perceiver will *first* try to identify whether the causal locus is within the person or the situation (e.g., “Was it something about the driver or something about the situation, that made him bump into the other car?”) and only *afterward* will the perceiver infer a dispositional characteristic about the person (e.g., the driver is careless) if, and only if, the identified cause was personal. Hence, according to the classical causal attribution theories, whenever the perceiver would decide that the behaviour had been unintentional or an instance

of situational causation (e.g., malfunction of the brakes), then no disposition about the actor would be inferred.

2.2.2. THE CORRESPONDENCE BIAS

2.2.2.A) EMPIRICAL DEMONSTRATIONS AND DEFINITION

A crucial empirical finding that challenged these assumptions of classical attribution theories was offered by Jones and Harris (1967) in a set of studies that were designed to test Jones and Davis' (1965) theory of correspondent inferences. As mentioned before, this theory assumes that the social perceiver will draw a correspondent inference only when the observed behaviour has diagnostic power, namely when it contradicts prior expectancies (e.g., the high probability behaviour based on social norms) and is not constrained by the situation (i.e., the actor freely chose to perform it). Therefore, Jones and Harris (1967) crossed a prior probability variable with a perceived choice variable and examined the obtained inferences in terms of their correspondence in a paradigm that would become popularized (and a classic of its own) as the *attitude attribution paradigm*.

In a set of three studies, participants were asked to guess an essay writer's true attitude towards a polemic issue (e.g., Fidel Castro's Cuba). In the focal conditions participants were informed whether or not the essay writer had had the opportunity to choose which side to endorse (i.e., choice and no-choice conditions) and provided with an essay, whose direction could match or mismatch the expected direction (e.g., anti- or pro-Castro). The obtained results verify that participants took into account the choice factor and prior expectancies, at least to some extent, but they also strikingly show "the powerful effect on attribution of the content of opinions expressed" (Jones & Harris, 1967, p. 22). In other words, even when it was the case that the essay writer was merely following instructions, and his/her behaviour was totally explainable by situational factors, participants still inferred a correspondent disposition of the actor. Would the inferred disposition have matched prior expectancies (i.e., the mainstream attitude of the public), then the phenomenon would be interpretable in terms of an appropriate consideration of base-rate information (in Kahneman and Tversky's terminology, 1973). However, in spite of prior expectancies and without any apparent reasonable basis, since the participants were aware that the essays could not themselves

convey the true attitude of the writer, the inferred attitudes *corresponded* to the attitude expressed in the essay.

Another interesting result obtained in Jones and Harris' studies (1967) was a heightened variance of participants' ratings when behaviour was inconsistent with prior expectancy and performed under situational constraints. The authors interpreted this as a product of perceived ambiguity and the consequent application of different strategies by the participants (e.g., reliance on the behaviour, focus on the context, projection of own attitude).

The correspondence between essay contents (i.e., behaviour) and inferred attitude (i.e., disposition), not only when essay writers had had freedom of choice (i.e., choice conditions), but also when they had been assigned to write in support of a particular position (i.e., no-choice conditions), was studied in countless laboratory experiments (e.g., Gilbert & Jones, 1986; Miller, Jones, & Hinkle, 1981; Snyder & Jones, 1974), many of them designed to address alternative explanations of the original results. One of the most impressive demonstrations of the robustness of the effect was conducted by Gilbert and Jones (1986). In their studies the target person was no more an essay writer, but ostensibly merely someone who would read experimenter-generated answers. Moreover and more importantly, the participants were assigned to deliver the situational constraints themselves, indicating the target person which answer he should read (e.g., the liberal or the conservative version). Even in such circumstances, in which situational constraints were very salient to the participants (i.e., participants were the explicit inducers of the target's behaviour) and the target's behaviour was externally determined to a maximum degree (i.e., experimenter-generated answers and participant-indicated direction), participants still inferred a correspondent disposition from the target's behaviour.¹⁴

This logic-defying and repeatedly obtained effect was named the *correspondence bias*. Returning to the opening example of this chapter, just like watching someone failing at parking (in a tiny parking spot) can lead you to grumble at such a failure of a driver, so can the correspondence bias be defined as “the tendency to draw inferences about a person's unique and enduring dispositions from behaviors that can be entirely explained by the situations in which they occur” (Gilbert & Malone, 1995, p. 21).

¹⁴ The correspondence between expressed behaviour and inferred disposition has been commonly studied also under other paradigms (cf. Gawronski, 2004), namely the silent interview paradigm (Snyder & Frankel, 1976), the quiz-role paradigm (Ross, Amabile, & Steinmetz, 1977) and the moral attribution paradigm (Bierbrauer, 1979).

2.2.2.B) CONTRASTS WITH THE FUNDAMENTAL ATTRIBUTION ERROR

Tendencies similar to the *correspondence bias*, regarding the social perceiver outside the laboratory, were identified in the social psychological literature quite long ago. In fact, in 1944 Heider wrote, “often the momentary situation which, at least in part, determines the behavior of a person is disregarded and the behavior is taken as a manifestation of personal characteristics” (p. 361). Heider cites previous papers by Ichheiser on this same topic, more specifically on interpretations of success that neglect the role played by sheer luck. Ironically, it seems that Ichheiser did not have the benefit of particularly lucky life events and he is considered by several researchers (e.g., Boski & Rudmin, 1989; Gilbert, 1998a) to be a pioneer who failed to collect the deserved recognition for his numerous and early insights. From all those insights, however, the identification of the common overestimation of personal factors both by laypeople and psychologists may be the most frequently cited one (Boski & Rudmin, 1989), and it took many forms, one of them being, “we all have in everyday life the tendency to interpret and evaluate the behavior of other people in terms of specific personality characteristics rather than in terms of the specific social situations in which those people are placed” (Ichheiser, 1949, p. 47).

A decade after the publication of Jones and Harris’ studies (1967), Ross (1977) reviewed many renowned social psychological experiments (e.g., Darley & Batson, 1973; Festinger & Carlsmith, 1959; Milgram, 1963) pointing out that their results are surprising (i.e., attitude change following forced compliance, obedience to an experimenter, and inhibition of bystander intervention, respectively), both to laypeople and to psychologists, exactly because we all tend to underestimate the powerful situational forces that operated in those paradigms. Ross (1977) baptized the phenomenon “the fundamental attribution error” and defined it as “the tendency for attributers to underestimate the impact of situational factors and to overestimate the role of dispositional factors in controlling behavior” (p. 183). In Ross’ theorising, the correspondence bias constituted one of the instances of this more general and ubiquitous tendency for social perceivers to prefer dispositional over situational explanations of behaviour.

Because the correspondence bias shares many features with the fundamental attribution error, it happens very commonly in the literature that the two terms are used interchangeably (cf. Hamilton, 1998). Jones, for example, who was one of the authors responsible for the first empirical demonstration of the correspondence bias, used the label

fundamental attribution error, and also *overattribution to the person*, to refer to the effect in his 1979 review paper. Nevertheless, a distinction between the two biases can (and should, for clarity reasons) be made. The correspondence bias refers to *inferences* (Hamilton, 1998) that are drawn in strict correspondence to the observed behaviour, even when the perceiver knows that the behaviour is non-diagnostic. Thus, the correspondence bias tends to emerge when the perceiver is trying to understand *what* the actor, or the situation, is like (Erickson & Krull, 1999). In the parking example, you would still perceive the driver as incompetent, although you know the parking spot is tiny. In contrast, the fundamental attribution error refers primarily to *attributions* (Hamilton, 1998) or causal explanations of a behaviour in terms of the dispositional characteristics of the actor rather than of the situation. The fundamental attribution error tends to emerge when the perceiver is trying to explain *why* the actor behaved in a certain way (Erickson & Krull, 1999). For example, you would tend to think that the cause of the long manoeuvring resides in a characteristic of the driver (and that characteristic may be the correspondent inference you made), and underestimate the impact of situational causes (e.g., size of the parking spot).

The two concepts can also be distinguished regarding the empirical support they have gathered (e.g., Gawronski, 2004). While the correspondence bias is a well documented phenomenon in the laboratory (e.g., Gawronski, 2004; Gilbert & Malone, 1995; Jones, 1979), the ubiquitous character of the fundamental attribution error has been challenged whenever participants seem to prefer situational causes over dispositional ones, either because they were the actors of the focal behaviour (e.g., Jones & Nisbett, 1972; Storms, 1973; but see Malle, 2006), or because they are members of a collectivist culture (e.g., Miller, 1984). Moreover, when participants fail to fully take into account the actor's dispositions that could have caused the behaviour, and infer situational characteristics that are correspondent to the behaviour (e.g., Krull, 1993; Quattrone, 1982), one can still say that the participants exhibited the correspondence bias, but not that they exhibited the fundamental attribution error.¹⁵

2.2.2.C) CLASSICAL EXPLANATIONS OF THE CORRESPONDENCE BIAS

As previously mentioned, the correspondence bias posed a challenge to the classical attribution theories, for these theories assumed that a dispositional inference would not be

¹⁵ Ross (e.g., 2001), the proponent of the *fundamental attribution error* label, presently prefers the descriptor *lay dispositionism* to avoid conveying the idea that the tendency is irreducible, ubiquitous, and inaccurate.

drawn if the perceiver would locate the cause of the behaviour in the situation. Still, two commonly cited explanation attempts for the correspondence bias originated in the classical approach, and warrant mentioning here since they were subsequently integrated in the three-stage model of person perception (Gilbert, Pelham et al., 1988).

One of these explanations is contained in the renowned quote by Heider (1958) “it seems that behavior in particular has such salient properties it tends to engulf the total field rather than be confined to its proper position as a local stimulus whose interpretation requires the additional data of a surrounding field” (p. 54). However, the *act-actor unit* cannot serve as a full explanation for the correspondence bias, in the sense that it would introduce tautological reasoning.¹⁶ Moreover, as discussed above regarding Gilbert and Jones’ studies (1986), the relative salience of the behaviour against the *surrounding field* seem to have little impact on the tendency for perceivers to exhibit the correspondence bias.

The other explanation attempt was put forward by Kelley (1973) in his proposal of how social perceivers attribute causes based on a single behavioural observation. According to Kelley, Jones and Harris’ participants (1967) applied the discounting principle, thus producing less extreme attitude attribution in the presence of external constraints; the discount was merely incomplete. However, within Kelley’s theory, it is not clear why participants considered an actor’s disposition as a plausible cause of an effect otherwise totally explainable by an external constraint and also why the discount was not fully accomplished.¹⁷

It is only natural that classical attribution theories could not offer a sufficient explanation of the correspondence bias, when the bias itself contradicts one of the basal assumptions of the classical theories, namely that the perceiver starts by deciding whether the behaviour was caused by the actor, the situation, or an interaction of the two, and only then infers dispositions. Gilbert (1991), while discussing another issue,¹⁸ suggested that these kinds of systems (in which judgement is suspended until a choice between two alternative outputs is made) would fit quite well a creationist point of view: If a system for solving attributional problems would be designed from scratch, then the implementation of classical theories principles would be a sound option.

¹⁶ In Jones and Harris’ words (1967) “This describes the results without really explaining them” (p. 22).

¹⁷ It may be curious to note, since this research project looks into developmental data, that another explanation offered by Kelley (1973) is that participants incur in the correspondence bias because they prefer simple over complex causal schemata. Kelley traces this preference back to childhood and advances the continuity hypothesis that adults are more able and more frequent in applying complex causal reasoning, but that the preference for simple causal reasoning holds across development (p. 22). One would, thus, expect that children would incur even more visibly in the correspondence bias.

¹⁸ Namely “How mental systems believe” (Gilbert, 1991).

2.2.3. INFORMATION PROCESSING MODELS

“But nature does not start from scratch” (Gilbert, 1991, p. 116) and from both an evolutionist and a bounded rationality point of view it would be more plausible to think that social perceivers have some kind of readily available answer for attributional problems (given its importance for navigating in a social world), based on simple and previous processes, and that this answer can subsequently be regulated to better fit the actual circumstances.

This kind of *adjustment* mechanism is very similar to one discussed by Tversky and Kahneman (1974), in order to explain the anchoring effect. A clear demonstration of the anchoring effect (i.e., a bias in judgement towards an initial value) was accomplished in a task where participants had to estimate a numerical value (e.g., percentage of African countries in the United Nations). Participants first received an ostensibly random number (i.e., by the spinning of a wheel of fortune), and after they had indicated whether their estimate was higher or lower than that number, they produced the final estimate. The authors noticed the participants’ bias towards the initial value, in this and in other estimation problems, and suggested that it occurs because participants use the initial value as an anchor and adjust insufficiently towards the intended estimate (Tversky & Kahneman, 1974).

Actually, the adjustment and anchoring heuristic is believed by some authors to be a fundamental one. If the architecture of the human information processing system is globally envisioned as dualistic along with assumptions of rule-based processes monitoring and correcting readily available responses produced by associative processes, then this heuristic “describes the process by which the human mind does virtually all of its inferential work” (Gilbert, 2002, p. 167).

This radically different way of conceiving social perceivers’ mental operations appeared only with the rise of the social cognitive approach. The information processing theories that followed the classical attribution theories aimed at describing the mechanisms that social perceivers *actually* use and at describing them with detail (e.g., Gilbert, 1998a). In a sense, the definition of attributional principles gave way to the definition of mental operations and their temporal arrangement.

2.2.3.A) QUATTRONE

Bridging the classical and the information processing approaches to attribution, Jones (1979), commenting on one of his student's to-be-published work (Quattrone, 1982), suggested that the correspondence bias is produced by an anchoring and adjustment inferential process, with the anchor being a correspondent inference by default (e.g., the driver is not succeeding at parking and is thus assumed to be incompetent; if the parking spot is indeed small, this information will be used to adjust the inference about the driver, but insufficiently: "Well, maybe he's not *that* incompetent").

Then, in Quattrone's paper (1982) the anchor/adjustment model applied to person perception is detailed and the stronger claim that the social perceiver begins by drawing an inference (about the person or situation) and only then adjusts for alternative causes is made and empirically supported. Instead of regarding attributional reasoning (i.e., determination of causal locus) as a prerequisite to infer dispositions of the actor or characteristics of the situation, Quattrone argues that this inferential process occurs before the attributional reasoning, so that the social perceiver uses dispositional or situational stimuli as an anchor to be subsequently adjusted. In two studies, Quattrone used an adaptation of the attitude attribution paradigm, to verify his thesis. In one of them, participants read essays supposedly written by people who either endorsed the expressed attitude or had no formed attitude. Their task was to infer whether and how much the situation (i.e., pressure subtly exerted by the experimenter) had constrained the essay writers. Consistent with the anchoring and adjustment model, but reversing the dispositional overattribution effect (i.e., correspondence bias), participants tended to infer congruent situational constraints, even in the condition where the writers' attitudes would account for the expressed attitudes (i.e., they overattributed to the situation).

While showing that the correspondence bias can be reversed (e.g., "That parking spot must be tiny; look how long that driver apprentice is struggling to park the car"), Quattrone's work (1982) contributed with a decisive step towards the explanation of the bias. One of the crucial aspects, and breakthroughs, of this model is that it allows for a conceptualization of dispositional inference as detached from causal attribution processes. However, and as Jones (1979, p. 115) explicitly recognizes, invoking *insufficient adjustment* to explain the *correspondence bias* merely replaces one error by another. The advantage lies on the fact that insufficient adjustment seems to be a more basal error, which occurs not only in social perception domains, but generally in the processing of serially presented information

(Tversky and Kahneman, 1974). The drawback is that, for the correspondence bias to be explained, why adjustments are usually insufficient and why the actor's dispositions are taken as an anchor, even in those circumstances when they should be ignored (e.g., Jones and Harris, 1967), need to be answered (e.g., Heider, 1944; Ichheiser, 1949; Ross, 1977).

2.2.3.B) TROPE

This latter issue, regarding the links between behaviour and dispositions, was further addressed by Trope (1986), who also proposed a two-stage attributional model. Trope's model covered an omission of most attributional theories, namely an understanding of the factors that influence the definition of the behaviour itself - the *identification process*. Trope argues that the mere identification of a behaviour is contextually dependent and an inferential process (e.g., a car moving back and forth several times while parking can be regarded as unskilled or industrious manoeuvres, depending on contextual factors, like the size of the parking spot). The other stage – *dispositional inference process* – focuses on inferences from behaviour to dispositions, and is thus more akin to other attributional theories.

In addition to covering a theoretical gap, substantiating the notion that perception itself and other basic cognitive processes are essentially constructive, Trope's model (1986) introduces the harmonious idea that the same set of factors, namely *situational* information, *behavioural* information, and *prior* information about the actor, influences both stages of processing. In a first stage the social perceiver will use available cues, of all three types of aforementioned information, to infer about the identity of the situation (e.g., difficult parking spot), of the behaviour (e.g., long manoeuvring), and of the actor's antecedents (e.g., past difficulty at driving). By doing so, the perceiver will use the cues, not only to infer the respective dimension (e.g., small parking space means a difficult parking spot), but also to infer other dimensions (e.g., small parking space means difficult manoeuvres). Moreover, it is predicted by the model that more ambiguous factors (i.e., whose cues are associated with more than one identity) will be more strongly influenced by the other factors (e.g., if one knows that the parking spot is small, the driver's attempts at parking may seem to be desperate, when they are merely regular). In the second stage, after situation, behaviour, and priors are identified, Trope theorises that they will be used to infer a disposition. The actor's priors and present behaviour (as conceived of by the social perceiver) will be taken as correspondent indicators of the actor's dispositions. The situation, on the other hand, the more

it is consistent with the behaviour, the more it will counterwork the dispositional inference (consonantly with Kelley's (1973) *discounting principle* and Jones and Davis' (1965) *social desirability hypothesis*).

Trope (1986) tested some of the model predictions in two studies presented along with the model. In one of them, participants read a short description of an emotion-eliciting situation (e.g., frightening event) and then saw a photograph of a face expressing either a non-ambiguous (e.g., fear) or an ambiguous emotion (e.g., fear and happiness). Non-ambiguous emotional expressions (e.g., fear) could be paired with situations that elicited that same emotion or another emotion (e.g., happiness). One group of participants rated how much the targets were feeling each of five emotions. In agreement with the model, participants' behavioural identification (e.g., fear) was inline with the pre-tested behavioural cues (e.g., a fearful face). Moreover, behavioural identification did not depend exclusively on behavioural cues, but on situational cues as well (e.g., a fearful face was considered to be expressing more fear when paired with a frightening situation, than with other situations), this being especially striking in ambiguous behaviours (e.g., face expressing fear and happiness). Another group of participants rated how much the targets could be dispositionally characterized by each of the same five emotional traits. These dispositional ratings depended again partially on the expressed behaviour (e.g., a target with a fearful face was believed to be usually more fearful than a target with a happy face). More interestingly, and once more supporting the model, with non-ambiguous faces the situation attenuated the dispositional inference (e.g., a target with a fearful face, in a frightening situation, was believed to be usually less fearful than if the situation did not elicit fear), while the reverse pattern was obtained for the ambiguous faces (e.g., a target with a fearful and happy face, in a frightening situation, was believed to be usually more fearful than if the situation did not elicit fear).

Trope's suggestions and data (1986) concerning the role played by situational information in the attributional process are interesting from, at least, two perspectives: (1) First, they strengthen the idea that the exact same behaviour in two different situations can be *perceived* (identified) quite differently (e.g., the manoeuvring towards a tiny parking spot may look more painful than if it was towards a larger spot). One of the many implications of this idea refers directly to experimental methodology, alerting the researcher that presenting participants of different experimental conditions with the same behavioural information does not assure that they will *perceive* the same behaviour (Gilbert, 1998a); (2) Second, by proposing that situational information plays a paradoxical role in the attribution process (i.e., works in one direction to reduce behavioural ambiguity, but in the opposite direction to

delineate a dispositional inference), Trope's model can be used to understand instances when a dispositional inference was discounted, or not, by situational characteristics, but more importantly also instances when the dispositional inference was augmented (e.g., the driver parking at the tiny spot seems to be more incompetent, since he had *such* a hard time manoeuvring; Snyder & Frankel, 1976).

According to Trope's model (1986) the correspondence bias does not have necessarily to be the product of an insufficient adjustment. The bias can come about as the simple result of an inflated identification (e.g., the parking manoeuvres may have seemed to take longer than they did objectively). However, on the one hand, it is not clear if this proposal could account for the magnitude of the correspondence bias obtained in attitude attribution studies with non-ambiguous stimuli, for example, and on the other hand, this proposal is compatible with Quattrone's model (1982).

INFORMATION PROCESSING MODELS

In fact, there are a considerable number of similarities between Quattrone's (1982) and Trope's (1986) theories as person perception information processing models. These two theories are certainly not the only representatives of this type of model, but their importance as building blocks for the three-stage model of person perception is declared by the authors right from the start (Gilbert, Pelham et al., 1988), and they well illustrate the main characteristics of the models that were products of the information processing approach. Both models are primarily dispositional inference models, which can encompass the application of causal attribution principles (e.g., the discounting principle) at the second stage, but which do not model the dispositional inference as being contingent to causal attribution reasoning. These models conceive better-defined and amenable mental operations arranged in sequence (rather than logical principles and complex algorithms). The processes assumed to be involved in these mental operations are simpler and closer to other basic cognitive processes (e.g., the anchoring and adjusting heuristic in Quattrone's model and categorization and assimilation to expectancies in Trope's model). By postulating simpler mental operations and a step-wise processing, and thus an early available if not optimal response that can be later modified, these models are more attuned with a conception of the human being as cognitively bound by informational, temporal, and motivational constraints. Hence, information processing models, in contrast with classical theories, tend to have higher and more accurate

descriptive, predictive, and explanatory power (e.g., Quattrone's model predicts and explains the occurrence of non-normative results by insufficient adjustments and Trope's model predicts and explains the full range of attributional effects that situational factors can produce).

One other way that the discussed models diverge from classical attributional theories is by assigning different roles to dispositional and situational factors (rather than considering them as alternative outputs of causal reasoning). In Quattrone's model (1982) one or the other type of factors would work as an anchor, while the remaining one would be used to adjust the inference. In Trope's model (1986) situational factors contribute with contextual influences to the identification of behaviour and then are used again to interpret behaviour and shape the dispositional inference.

2.2.4. THE THREE-STAGE MODEL

The three-stage model of person perception (Gilbert, Pelham et al., 1988), which was put to test in the present research project, is itself an information processing model and, as such, shares all the above mentioned characteristics. Actually, the three-stage model, an intellectual descendant of Jones and Davis' dispositional inference model (1965), was presented by its authors basically as an integration of Quattrone's (1982) and Trope's (1986) models, with an added specification about the processing characteristics of the mental operations.

2.2.4.A) COMPOSITION OF THE MODEL

The three stages involved in person perception, as proposed in the first presentations of the model (Gilbert, Pelham et al., 1988; see also Gilbert, 1989; Gilbert, Krull, & Pelham, 1988), are:

- (1) *Categorization*: this operation focuses on the behaviour and transforms perceptive data (e.g., the car is moving back and forth many times) into meaningful units (e.g., the driver is having a hard time parking). The social perceiver is usually unaware of the inferential nature of this stage, phenomenologically feeling that this description of the *act* is actually

what was perceived (and not so much the *actions* that compose the *act*¹⁹). The definition of this stage was inspired in Trope's *identification* process (1986);

(2) *Characterization*: this operation focuses on the actor and uses the outputs of the preceding stage to produce a dispositional inference (e.g., the driver is incompetent at parking). This stage was inspired in Trope's *dispositional inference* process (1986) and in Quattrone's *anchoring* stage (1982).

(3) *Correction*²⁰: this operation focuses on the consideration of potential situational constraints by the social perceiver. Such constraints may be used to modify the previously drawn dispositional inference (e.g., the parking spot was tiny, the driver may not be incompetent after all). This stage was inspired in Quattrone's *adjustment* stage (1982).

The innovative specification about the processing characteristics of the operations is that *characterization* is presented as a much more automatic subprocess than *correction*. Gilbert, Pelham, and Krull (1988) define automaticity in terms of being “generally an overlearned ... process that requires little effort or conscious attention” (p. 734) and opposing to “a more deliberate, relatively controlled process that uses a significant portion of the perceiver's processing resources” (p. 734) or to a slow and effortful kind of reasoning (Gilbert, 1989). Alongside with the presented studies, the authors invoke the work on spontaneous trait inferences by Uleman and collaborators (e.g., Winter & Uleman, 1984; Winter, Uleman, & Cunniff, 1985) as convergent evidence for the relatively automatic nature of the dispositional characterization process (Gilbert, 1989; Gilbert, Krull et al., 1988). In fact, Trope (1986) had also suggested that “the attribution of a disposition to another person may be experienced as a direct, immediate perception” (p. 241) by virtue of being an overlearned operation. Summing up, the model was initially presented as a sequence of three operations with increasing levels of demand on cognitive resources: *behavioural categorization – dispositional characterization – situational correction*.

New empirical findings and the advancement of related theoretical proposals pointed to the desirability of reformulating slightly the three-stage model (Gilbert, Pelham, & Krull, 2003). So, subsequently, the three operations have been conceptualized as being carried out by an interplay of two systems that operate not sequentially but in parallel and recurrently (i.e., *reflexive* and *reflective* systems; Lieberman, Gaunt, Gilbert, & Trope, 2002).

¹⁹ Terminology taken from Gilbert's inferential sequence (1998a) of person perception: actions – acts – dispositions – impression.

²⁰ The model is sometimes informally called “the 3Cs-model”, given the “alliterative frenzy” (Gilbert, 1998b, p. 17) contained in the subprocesses designations.

Categorization and characterization, in this latest version, are thought of as being achieved by pattern matching, between informational inputs and internal activation patterns, in a system that can be modelled by connectionist assumptions (e.g., parallel constraint satisfaction, distributed and subsymbolic processing). The status of this system will be affected by current or chronic goals of the social perceiver, so that a dispositional and/or situational characterization may be the most prominent inference drawn from the observed behaviour. Correction, on the other hand, is envisioned to be carried out by a rule-based and symbolic system, strongly constrained by capacity limitations, and alarm-driven (i.e., that is called to action when there is a certain amount of tension in the pattern matching task). Hence, while the essence of the model remains unaltered, its dualistic architecture was better specified, and the social perceiver's flexibility in terms of which inference serves as a starting point (*dispositional* or *situational characterization*) and which serve as alternatives (*correction*) was encompassed.

The three-stage model has been described as an already partially assembled theory at the moment of its composition, whose assumptions were not incredibly original (Gilbert, 1998b). But this fact does not minimize the extent and importance of the qualities of the model:

- (1) The model provides a compelling description of the basic cognitive operations underlying the *correspondence bias*. Without excluding motivational or functional explanations for the occurrence of the bias at a given moment, but also not depending on such explanations, the model offers convincing solutions to the problems of why situational adjustment is often insufficient, producing a dispositional anchoring effect (i.e., due to different efficiency-based disruption thresholds of the characterization and correction operations) and of why the bias seems to be so pervasive (i.e., because social perceivers are often multitasking).
- (2) The three-stage model consolidates dispositional inference processes as not-mediated by attributional processes, helping to clarify the distinctions between two types of person perception processes, whose study had been amalgamated in the past.
- (3) Besides, the model shares with other information processing models some advances relatively to classical attribution theories. Namely, the model describes the social perceiver's behaviour *better* (with its normative deviations), with more *depth* (specifying a sequence of operations and their operative characteristics), and with higher adequacy to mundane scenarios (where cognitive resources are scarce).

- (4) The model integrates a lot of past literature and research findings. Beyond the already mentioned Quattrone's (1982) and Trope's (1986) models, Tversky and Kahneman (1974) and Uleman and collaborators' findings (Winter & Uleman, 1984; Winter et al., 1985), the model arches over classical attribution principles, such as Kelley's discounting principle (1973) or Jones and Davis' social desirability hypothesis (1965), suggesting that they can be applied in the correction phase (Gilbert, 1998a).
- (5) Moreover, by postulating and defining the existence of more automatic and more deliberate operations involved in person perception, the model joins the class of other dual-processing theories. This convergence with all other areas (e.g., persuasion, impression formation), where human behaviour is modelled according to a dual architecture, solidifies the plausibility of the model.

2.2.4.B) EXPERIMENTAL TESTS OF THE MODEL

But theories do not live by assumptions alone. The empirical evidence gathered by the authors of the model ranges from indirect corroboration to direct tests of the assumptions of the model.

As indirect evidence for the relative automaticity of the characterization operation and for its correspondent relation with the categorization subprocess, Gilbert, Krull, and Pelham (1988) cited, as mentioned above, Uleman and collaborators' studies showing that social perceivers spontaneously draw trait inferences from trait implicative behaviours, "without intention, without interference by differential drain on processing capacity, and with little awareness" (Winter et al., 1985, p. 904). Because research on spontaneous trait inferences has developed greatly since the pioneering studies by Winter and Uleman (1984) and because this body of evidence presents an impressive convergence with the assumptions of the three-stage model, I will resume this topic on a later section [SECTION 2.2.6].

Another piece of indirect evidence concerns the role played by the consumption of cognitive resources on the emergence of the correspondence bias. Gilbert, Pelham, and Krull (1988) commented on the high variance of ratings obtained in the no-choice condition (i.e., when behaviour is situationally constrained) of the original attitude attribution paradigm (Jones & Harris, 1967). One explanation that could easily account for such a high variance is that participants varied in the amount of attention they devoted to the task. Some participants may have allocated total attention to the focal task (not incurring in the correspondence bias),

while others may have distributed their attentional resources among other cognitive tasks (i.e., they were somewhat distracted and incurred in the bias).

Notwithstanding the worth of indirect evidence, the two studies that accompanied the presentation of the model (Gilbert, Pelham et al., 1988) are naturally better tests of the model, and the resulting paper has been considered to have the potential to turn into a modern classic (Martin & Erber, 2003). Because the paradigms used in the present research project relate somehow closely to the ones used in these studies, describing the studies with some detail will hopefully be of use to a better understanding of the forthcoming experimental work. Both of the original studies (Gilbert, Pelham et al., 1988) were built upon an adaptation of previously used paradigms, with two ingenious and elegant manipulations of cognitive resources availability or “cognitive busyness” (p. 733).

The first of the studies is sometimes informally called *the anxious woman study* and its paradigm, more formally known as *the silent interview paradigm*, was created by Snyder and Frankel (1976)²¹. In this study participants watched seven short clips of a woman talking to someone (supposedly a stranger) outside camera’s reach. In five of these clips the woman looked quite anxious, while in the remaining two she appeared to be rather relaxed. Participants could not hear what the woman was saying (allegedly due to privacy concerns), but they were informed about the discussion topics via subtitles. In one of the experimental conditions all of the seven clips had relaxing topics as subtitles (e.g., *great books*), implying that the anxiety displayed by the woman in five of the clips was not situationally induced. In contrast, in another experimental condition, the five clips, where the woman looked anxious, had anxious topics as subtitles (e.g., *personal failures*), implying that the anxiety may be situationally justifiable. The greater difference between this and the original study, however, is materialized in the two other experimental conditions. In those two other conditions, participants had to memorize the topics contained in the subtitles, so that they could later report them. The ingenuity of this manipulation of cognitive resources resides in the fact that participants are forced to divide their attention by trying to memorize the precise situational factors that would enable them to accomplish a more complete person perception task. Thus, it cannot be said that the cognitive overload impeached participants to read or notice situational factors. In fact, while participants in the first two conditions rated the woman’s trait anxiety and predicted the woman’s future anxiety state as expected by the consideration

²¹ This study has already been cited in this dissertation [SEE SECTION 2.2.3.B], for showing that behavioural identification can be amplified by consistent situational cues (i.e., an anxious woman may seem more anxious if she is placed in an anxiety-provoking situation)

of the discussion topics, participants in the overload conditions did not differ in their judgements, indicating that they did not use the situational information they remembered so well.

The second study consists of an adaptation of *the attitude attribution paradigm*, created by Jones and Harris (1967). In this study all participants were placed in *no-choice* conditions (i.e., where the essay writer had been assigned to express a certain attitude) and their task consisted of listening to the essay and determining the true attitude of the essay writer. The essay could either express a favourable or an opposing attitude on a public interest issue. Orthogonally, participants were asked to either just diagnose the writer's true attitude or to do that knowing that afterwards it would be their turn to write an assigned essay and read it out loud. The elegance of this manipulation of cognitive resources lies in the fact that it more closely resembles the type of resources depletion that one can experience during an interaction with others (i.e., preparing what to say next), coupled with low levels of extraneous invasiveness (i.e., participants were not given a second simultaneous task, like memorizing, but were merely informed they would do a second sequential task). Moreover, this manipulation, by prospectively putting some participants in the same situation as the essay writer, if anything, could promote a better understanding of the situational constraints in those participants. Nevertheless, those were the participants who exhibited more strongly the correspondence bias, attributing correspondent attitudes to the constrained writer.

Two other studies (Gilbert, Krull et al., 1988) pursued the idea that social perceivers who are actively engaged in interactions, and self-regulation activities that commonly come with such interactions, are more susceptible to the correspondence bias. The first study used once again the silent interview paradigm, but the focal trait was sadness (i.e., in five out of seven clips the woman was acting sadly, and the discussion topics could be either sad or happy). The self-regulation manipulation was introduced by telling some participants that they could ignore some words that would appear on screen (*unregulated condition*) and the other participants that they were supposed to ignore them (*self-regulated condition*). The second study again used a modified version of the attitude attribution paradigm, but this time participants (as interviewers) interacted with the target (the interviewee), who would read provided answers. The self-regulation manipulation required some participants to try to ingratiate a likeable interviewee (*low-self-regulation condition*) and some others to try to ingratiate a dislikeable interviewee (*high-self-regulation condition*). In both studies, participants under self-regulation requirements incurred more heavily in the correspondence bias. Interpreting self-regulation as a rather common activity that uses a fairly amount of

cognitive resources, this set of studies provided additional support for the validity of the model and for its adequacy for more mundane application.

In a series of other studies, mainly using the silent interview paradigm, Gilbert and collaborators explored aspects related to the model, including whether correction could be resumed upon the release of cognitive resources (Gilbert & Osborne, 1989) and the double role of prospective interaction with the target, both as correction promoter (accuracy motivation) and as correction obstructer (consumption of cognitive resources; Osborne & Gilbert, 1992). Results of these studies, although not direct tests of the model, strongly support the model assumptions, including that cognitive overload impairs selectively the correction operation, not behavioural categorization (Gilbert & Osborne, 1989), even when it is the categorization subprocess that competes for cognitive resources (e.g., when behaviour is hard to identify; Gilbert, McNulty, Giuliano, & Benson, 1992).

Hopefully, the previous sections provided the reader with useful information to understand which questions were settled by the model [SECTION 2.2.2], in which ways the model represents an advance relatively to other models [SECTIONS 2.2.1 AND 2.2.3], and the composition and empirical robustness of the model [SECTION 2.2.4]. This information converges in a view of the three-stage model as a well established theory in social psychology literature, and, as stated before, this characteristic was one of the factors that motivated its test under an innovative perspective (namely, through an ontogenetic prediction derived from the model). But it would be misleading not to acknowledge that there are alternative explanations for the correspondence bias and that there are empirical findings that defy some of the model assumptions. The next section is devoted to the acknowledgement of some of such beyond the model claims and findings.

2.2.5. ALTERNATIVES AND CRITICISMS TO THE THREE-STAGE MODEL

2.2.5.A) ALTERNATIVE EXPLANATIONS OF THE CORRESPONDENCE BIAS

In 1979, Jones, one of the authors of the first empirical demonstration of the correspondence bias (Jones & Harris, 1967) and mentor of authors who built models capable of explaining it (Quattrone, 1982; Gilbert, Pelham et al., 1988), wrote:

It is quite clear that such [overattribution] bias is not always the effect of some unique cause: There is not a single, fundamental antecedent to go with the fundamental error. It is much more reasonable to expect that such biases can result from different combinations of shifting determinants and that some will be stronger in some settings than in others. (p. 115)

Almost 20 years later, Gilbert (1998b) confesses that the three-stage model was created to provide “The Complete Solution” (p. 16) to the correspondence bias problem. In this same paper, however, and even before (e.g., Gilbert & Malone, 1995), Gilbert acknowledges that the cognitive factors modelled in his theory are but one part of the possible factors that concur in producing the correspondence bias. In other words, insufficient correction of previously inferred dispositional attributes due to *cognitive busyness* (Gilbert, Pelham et al., 1988) can, as demonstrated, produce the correspondence bias, but other factors can also produce it. The three stages of the model itself can be used to frame the acknowledgment of a number of these other factors.

- (1) *Categorization*: The perception of the behaviour may be assimilated to situationally-induced expectancies or other prior expectancies, like stereotypic expectancies (Trope, 1986). In such cases of “inflated categorizations of behavior” (Gilbert & Malone, 1995, p. 28) or “misidentification of the actor’s behavior” (Gilbert, 1998b, p. 26), the correspondence bias would emerge even if the social perceiver applies a correction adequate to the situation (e.g., parking attempts made by a woman towards a small parking spot may seem from the outset as taking longer and being harder than the same moves performed by a man or towards a larger spot);
- (2) *Characterization*: Whenever a correspondent connection between behaviour and actor’s disposition is unwarranted, the social perceiver will be especially vulnerable to the correspondence bias (via insufficient correction). Such connections, however, seem difficult to avoid, because (a) traits can be inferred spontaneously and without awareness (e.g., someone who takes long to park the car elicits the inference of incompetent driver; e.g., Winter & Uleman, 1984), (b) origins of changes (even in asocial stimuli) tend to be seen as causes of those changes (e.g., the driver, not the parking spot, is operating the car; Heider & Simmel, 1944), (c) many languages, in their intricate relations with cognition, favour the application of the same qualifiers to behaviours (e.g., incompetent manoeuvring) and actors (e.g., incompetent drivers), but not to situations (e.g., no such thing as an incompetent parking spot; e.g., Gilbert, 1998a), (d) independent cultures tend

to conceive of the individual as responsible for her/his actions (e.g., Miller, 1984), and because (e) some behaviours may be considered highly diagnostic of a certain disposition, independently from the situational context in which it is exhibited (e.g., intentionally bumping into another car while parking may be diagnostic of an immoral disposition; e.g., Gawronski, 2004; Reeder, 1993).

(3) *Correction*: One can imagine a continuum from null correction until maximum correction. Null correction is probable when the perceiver is not aware of the constraints contained in the situation (or does not conceive them as such; Gawronski, 2004; Gilbert & Malone, 1995), may these constraints be *hard* (e.g., low drivability of the car), or *soft* (e.g., baby crying inside the car).²² Insufficient correction, besides being a very basic cognitive error (Tversky & Kahneman, 1974), may come about due to (a) insufficient cognitive resources (e.g., while you think about excuses for being late for the meeting, the driver blocking the traffic lane seems much more incompetent; Gilbert, Pelham et al., 1988), (b) misconceptions and non-accuracy motivated conceptions of how much the situation constrained the behaviour (e.g., good drivers park anywhere easily; Bierbrauer, 1979; Sherman, 1980), (c) lack of motivation to allocate cognitive resources to complete the process (e.g., the driver is not personally relevant; e.g., Gawronski, 2004), (d) an hypothesis confirmation bias (e.g., women are lousy drivers; e.g., Kunda, 1990), or to (e) otherwise pseudodiagnostic reasoning (e.g., Trope, 1998). Maximum correction will not originate the correspondence bias, but may allow it, if inflated categorizations have taken place.

There is a certain irony underlying the possibility of displaying beyond-the-model factors without leaving the boundaries of the model. Nonetheless, besides the organisational value of this possibility, I think it indicates the accommodative power of the model and substantiates, a bit further, the large acceptance of the model in person perception literature.

As mentioned above, factors commonly invoked as sources of the correspondence bias (other than insufficient situational correction due to scarcity of cognitive resources) do not compromise the validity of the three-stage model, but can be coordinated with it rather easily. In contrast, other types of evidence have been discussed as criticisms to the model, mainly to

²² *Hard* and *soft* constraints are terms used by Reeder (e.g., 2009) to denote situational constraints that are perceived to leave the actor with no behavioural choice or some degree of choice, respectively. Gilbert and Malone (1995) use the terms *behavioural* and *psychological* constraints to refer to roughly the same distinction.

its assumption that the focus of the characterization operation is the actor by default, and not the situation. Some of these issues will be briefly reviewed and discussed next.

2.2.5.B) SOCIAL PERCEIVER'S EPISTEMIC GOAL

Before the emergence of the three-stage model, Quattrone (1982) demonstrated, using the attitude attribution paradigm, that social perceivers are not bound to over-rely on dispositional information, relatively to situational information. In Quattrone's studies, participants were asked to judge the situation (not the actor's disposition), and they inferred situational pressures even when the actor's dispositions could account for the behaviour [*SEE SECTION 2.2.3*]. Although Quattrone stated that one of the main goals of these studies was to show that the correspondence bias can be reversed, and that situational inferences can function as inferential anchors, reference to this piece of evidence was absent from the initial presentations of the three-stage model.

The authors of the model (Gilbert, Pelham et al., 1988; Gilbert, Krull et al., 1988) cited Quattrone's contribution (1982) extensively, but only in what regards the application of the anchoring and adjustment heuristic to attributional problems. Moreover, it was suggested that Quattrone proposed that "perceivers first draw a dispositional inference" (Gilbert, Pelham et al., 1988, p. 733; and again in Gilbert, 1989, p. 193).²³ Other research was cited as supporting the association between behavioural categorization and dispositional characterization, like Uleman's and collaborators' work on spontaneous trait inferences (e.g., Winter & Uleman, 1984; Winter et al., 1985) and Trope's work (1986) on the links between behavioural identification and dispositional inference. It is somehow natural, then, that the three-stage model has been frequently interpreted as assuming an automatic correspondent relation between behavioural and dispositional inferences, and not with situational inferences.²⁴

A decade after Quattrone's studies (1982), and half a decade after the first formulation of the model (Gilbert, Pelham et al., 1988), however, one of the proponents of the three-stage model (Krull, 1993), re-tested the idea that the first inference to be drawn may depend on the inferential goal of the social perceiver. Krull used the silent interview paradigm, without the

²³ In a similar vein, in a figure displaying relation between models (Gilbert, 1998a, p. 113), Quattrone's two-stage model appears as "dispositional anchoring" and "situational adjustment".

²⁴ The authors of the model declare they never fully endorsed this assumption, though (see Krull's footnote 1, 1993)

discussion topics as subtitles, and asked some of the participants to guess how anxious the woman usually was (*dispositional inference goal*) and the other participants to guess how anxiety provoking the discussion topics were (*situational inference goal*), while also manipulating availability of cognitive resources. Participants in the dispositional inference goal condition replicated Gilbert, Pelham, and Krull's results (1988), whereas participants in the situational inference goal condition of the same study replicated Quattrone's results (1982).

The finding was consolidated in future research (e.g., Krull & Erickson, 1995; Krull & Dill, 1996), but it did not invalidate the three-stage model. Krull (1993) himself offered the solution, theorising that the model could be easily revised from a *fixed* into a *mixed* model of social perception. Depending on the epistemic goal of the social perceiver (i.e., momentary motivation to understand the actor or the situation), s/he will draw a correspondent and effortless inference about the actor (the D-sequence; e.g., What a lousy driver!) or the situation (the S-sequence; e.g., That must be a really tiny parking spot!), and subsequently adjust it using the remaining information (e.g., the size of the parking spot or the driver's other demonstrations of driving ability, respectively).

In later presentations of the three-stage model (Gilbert, 1998a; 1998b), it is explicitly said that it is irrelevant for the model composition, if the first inference to be drawn is a dispositional or a situational one. The essence of the model lies in the corrective design and in the assumptions of differential operating characteristics of the subprocesses.

From this perspective, the major contribution of the reviewed studies on the perceiver's epistemic goal (e.g., Krull, 1993; Quattrone, 1982) is not the finding that a situational inference will work as an anchor when social perceivers are asked to characterize the situation. Maybe characterization is like "dispositional perceptions that perceivers cannot help but have" (Gilbert, Pelham et al., 1988, p. 738), but this does not mean that perceivers will *see* traits all the time. Social perceivers, like object perceivers, see the things they are looking at, and if they are *looking* at the situation they will *see* characteristics of the situation. The important demonstration in these studies is that situational factors are not, in essence, more difficult to process; situational inferences can also be drawn efficiently.²⁵ It is the consideration of *alternative* factors involved in the production of the behaviour (i.e., situational or dispositional correction) that is cognitively demanding.

²⁵ Spontaneous situational inferences have been shown to occur in other paradigms (e.g., Lupfer, Clark, & Hutcherson, 1990).

2.2.5.C) CULTURAL DIFFERENCES

Another type of study that has been used to question dispositional inference primacy over consideration of situational constraints comes from cross-cultural research. Miller (1984), in a frequently cited paper in the attributional literature, presents two studies comparing explanations for behaviours provided by adults and children of an individualist culture (i.e., Americans) and a collectivist culture (i.e., Hindus).²⁶ In the first study participants were invited to briefly describe prosocial and deviant behaviours, which had been performed by people they knew well, and to provide explanations for those behaviours. The explanations were then coded as relating to the actor or to the context, and it was established that adults from individualist cultures named more dispositional explanations (particularly involving personality traits) than contextual explanations, whilst adults from collectivist cultures showed the reverse pattern of preferred explanations. In the second study American participants provided explanations for deviant behavioural anecdotes generated by Hindu participants in the previous study, and those explanations contained again more references to dispositional factors than the ones originally provided by Hindu participants.

These and other similar results (e.g., Lee, Hallahan, & Herzog, 1996; Miller, 1986; Morris & Peng, 1994) converge on the suggestion that dispositional biases may be culture specific (Markus & Kitayama, 1991; see also Krull et al., 1999) and that it may not be universally valid to consider that the default inference to be drawn from behaviour is dispositional in nature. From this perspective, then, the three-stage model would be defied as ethnocentric and not basic enough to be culturally independent.

However, criticism based on these findings is not really defying for the three-stage model validity for a number of reasons. (1) Miller's (1984) and similar causal attribution studies (e.g., Lee et al., 1996; Morris & Peng, 1994) indicate that members of collectivist cultures have a preference towards situational explanations compared to dispositional ones; they do not show that members of collectivist cultures do not draw correspondent dispositional inferences from situationally constrained behaviour (Krull et al., 1999). (2) The aforementioned studies may indeed imply that the fundamental attribution error is not ubiquitous; but, as discussed before, the notions of fundamental attribution error and correspondence bias are distinct [SECTION 2.2.2], and the correspondence bias, independently

²⁶ Other common terms to refer to this same distinction are *western/non-western cultures* (e.g., Miller, 1984) and, at the more individual level, *independent/interdependent* persons (Markus & Kitayama, 1991).

from its (unknown) prevalence in the real world, is a reliable laboratorial finding that warrants explanation. The three-stage model provides such an explanation. (3) Even if social perceivers from collectivist cultures differ from their counterparts from individualistic cultures in the content of the default inference they draw from behaviour, as the referred studies seem to imply, as long as the consideration of alternative factors is still more cognitively demanding, the three-stage model holds as valid (e.g., Krull, 1993).

An adequate cross-cultural assessment of the correspondence bias (and an indirect test of the model) requires examining whether members of a collectivist culture infer correspondent dispositions from situationally constrained behaviour, and Choi and Nisbett's studies (1998) assessed just that. Using the attitude attribution paradigm, the authors obtained correspondence bias in no-choice conditions, both with American and Korean participants. Another couple of similar studies were published one year later by Krull and collaborators (1999). These authors also used the attitude attribution paradigm (Study 1) and then the quiz-role paradigm (Study 2). As mentioned before [*SEE FOOTNOTE 14*], the quiz-role paradigm is another commonly used method to assess the correspondence bias. It was created by Ross, Amabile, and Steinmetz (1977) and its main features are: (a) one person is assigned to pose questions; (b) another person is assigned to answer those questions; (c) the participant is asked to rate both persons in terms of some intellectual dimension (e.g., intelligence, general knowledge). Correspondence bias emerges when participants rate the questioner more favourably than the answerer, in spite of the role-induced constraints (i.e., everybody knows how to pose questions, not everybody knows the answer to a specific question). In Krull and collaborators (1999) studies, both Americans and Chinese demonstrated the correspondence bias and in about the same degree. Moreover, correspondence bias was unrelated to individual levels of independence (individualism) or interdependence (collectivism).

Choi and Nisbett's (1998), as Krull and collaborators' (1999), studies not only show that the correspondence bias can be found cross-culturally, but they also support the idea that the fundamental attribution error (more tied to causal explanations and perceiver's beliefs; e.g., the driver is having a hard time parking because he is unskilled or because the parking spot is tiny) should be distinguished from the correspondence bias (relating to inferences, not necessarily causal ones nor necessarily inline with the perceiver's beliefs; e.g., the driver is having a hard time parking; he is unskilled).²⁷ Furthermore, these studies do not invalidate the

²⁷ In this respect it should be noted that Gawronski's review (2004), on the correspondence bias, does not find support for the existence of the fundamental attribution error, even in individualist cultures. Gawronski equates this error with the perceivers' supposed belief that situational factors are not (or are only to a low degree)

three-stage model, but on the contrary offer a specification. Krull (1993) had previously suggested that the social perceiver can instantiate a D-sequence (dispositional characterization followed by situational correction) or an S-sequence (situational characterization followed by dispositional correction) depending on her or his epistemic goal. Cultural differences in the preferred mode of social explanation may represent just one variable, as for example other individual differences, that influence “current cognitive and motivational factors (e.g., active categories, beliefs about causes and implications of behavior, goals, interests)” (Krull et al., 1999, p. 1215), which, in turn, will dictate the inferential sequence to be followed.

This extended model of social perception was tested by Lieberman, Jarcho, and Obayashi (2005) in a set of studies using the silent interview paradigm. American and East-Asian participants, in *cognitive load* and *no load* conditions, were asked to rate how anxious the interviewed woman was when the discussion topics were anxiety provoking (Study 1: D-sequence and discounting information) or when the topics were relaxing (Study 3: D-sequence and augmenting information), and how anxiety provoking the topics were when the woman was described as dispositionally anxious (Study 2: S-sequence and discounting information). The results of the studies were totally consistent with the flexible version of the three-stage model of person perception (Krull, 1993). Participants from both individualist and collectivist cultures “automatically generated strong attributions to the focus of their inferential goal” (Lieberman et al., 2005, p. 898), thus exhibiting the correspondence bias when the goal generated a D-sequence. However, there was a difference between American and East-Asian participants, in what refers to the comparison between *no load* and *cognitive load* ratings by cultural group. American participants seem to have used the remaining information in the expected direction (i.e., discounting or augmenting), whenever they could dispend cognitive resources. On the other hand, East-Asian participants seem to have strengthened their situational inferences (or weakened their dispositional inferences) under no load conditions. These last results do not have implications for the validity of the model. Instead, they may suggest that the cultural differences discussed at the beginning of this section impact the social perceiver’s judgements only at the corrective and more deliberate stage of processing.

Hence, notwithstanding the importance of cultural differences in person perception contexts, and the study of such differences, the three-stage model is still rather accurately

determinants of behaviour and argues that there is no evidence in the literature that social perceivers hold this belief (only that there are a number of ways in which perceivers can err while applying their theories about situational influences on behaviour, producing the correspondence bias).

adjusted to the inferences made by social perceivers of diverse cultures, depending on inferential goal and availability of cognitive resources.

Considerations about the social perceiver's epistemic goal and cultural membership defied one of the initial assumptions of the model, namely "that people make dispositional inferences that they then correct with information about the actor's situation" (Gilbert et al., 2003, p. 259). Yet, instead of invalidating the model, "research showing that people can also make situational inferences that they then correct with information about the actor's dispositions" (p.259) complemented the model. Other criticisms targeted the omission of certain aspects from the model, like for example motive or intentionality inferences (e.g., Reeder, 2009), or the role played by prior expectancies (Hamilton, 1998). Although these criticisms do not invalidate the model as well, they point to possible limits of its generality. To close this section of alternatives and criticisms to the three-stage model of person perception, work on prior expectancies will be reviewed because this construct has been linked to the correspondence bias since its first empirical demonstration (i.e., participants inferred a correspondent attitude from constrained behaviour *in spite of* prior expectancies).

2.2.5.D) PRIOR EXPECTANCIES

Although the three-stage model of person perception does not clearly define the role played by prior expectancies held by the social perceiver (e.g., women are incompetent at parking) either in the categorization, characterization, or correction stage, the study field of dispositional inference was never oblivious of the possible role played by such expectancies. In Jones and Davis' theory (1965), for example and as noted earlier, it was predicted that if behaviour did not conform to social desirability norms (i.e., a special case of prior expectancies), then it would be more informative and lead, more likely, to a correspondent inference. This prediction gained some corroboration in Jones and Harris' classical paper (1967), where participants inferred a correspondent inference from non-normative essays, even when the writer had been assigned to defend that particular point of view. Yet, in those studies, prior expectancies were not directly manipulated, but only tentatively identified by the researchers. Quattrone (1982) also analysed, in one of his reversed attitude attribution studies, the impact of prior expectancies on participants' inferences. These expectancies, however, were behavioural expectancies (i.e., assumptions about how extreme an essay in

average would be), not dispositional prior expectancies, and once again they were not manipulated.

A more systematic study of the influence of prior expectancies on dispositional inference was accomplished by Jones, Worchel, Goethals, and Grumet (1971), still within the attitude attribution paradigm. The authors manipulated prior expectancies concerning the writer's true attitude and extremity, as well as direction, of the essays, keeping the usual choice and no-choice conditions. Data indicated that participants' inferences in no-choice conditions were directly influenced by prior expectancies (i.e., a more favourable attitude was attributed to writers who were expected to favour a certain point of view, than to writers who were expected to oppose it). Conversely, in choice conditions, whenever the direction of the essay was inconsistent with prior expectancy, participants inferred a more polarized true attitude in the direction of the essay, than when behaviour and expectancies were consistent. In this study, the direction of the essay (i.e., behavioural information) was still the most powerful determinant of the dispositional inference.

Lopes (1972) adjusted an information integration model to Jones and collaborators' data (1971) and proposed that perceivers integrate information two-step wise. In the first step, social perceivers form a behavioural expectancy (i.e., in the previous study, how the essay will look like), considering situational constraints (i.e., level of choice) and prior expectancies (i.e., about the writer's attitude). In the second step, perceivers take into account eventual discrepancies (i.e., between actual essay and expected essay), the actual essay, and prior expectancies. One interesting finding of this adjusted model is that actual behaviour (i.e., essay) was weighted much more heavily than prior expectancies under choice conditions, but only a bit less heavily than prior expectancies under no-choice conditions. Moreover, the model suggests that when prior expectancies and actual behaviour are inconsistent with each other, the weight of the discrepancy will increase with its magnitude and favour the direction of the behaviour, producing a *contrast* effect. Although Lopes' model (1972) is a purely algebraic one, it is curious to note that the discrepancy term is conceived as responsible for "qualitative aspects" (p. 159) of Jones and collaborators' results (1971). Once this term only exists when expectancies are inconsistent with actual behaviour, this feature of the model points at the idea that inconsistency may bring about a qualitative (and not merely quantitative) difference in dispositional inference processes.

Prior expectancies were also contemplated in Trope's identification and inference model (1986, 1998). As discussed earlier [SEE SECTION 2.2.3], the author considered that *situational*, *behavioural*, and *prior* cues all served as contextual information, eliciting

expectancies, which in turn would influence behavioural identification. Furthermore, Trope explicitly included *priors* as one category of information that would impact dispositional inference, to designate the perceiver's prior expectancies about the actor's dispositions, based on the actor's past behaviour, group membership, or even physical appearance. This two-stage model predicted, thus, that prior expectancies could impact dispositional inferences in two major ways: (1) by inducing context-driven categorization of the behaviour whenever behavioural cues are ambiguous, expectancies are applicable, and knowledge about the situation or the actor's priors precede (closely) or accompany knowledge about the behaviour (e.g., look how long that woman has been trying to park the car; Trope, 1998); (2) by accentuating or attenuating a dispositional inference, whenever behaviour is not fully diagnostic (e.g., well, she is a woman, so probably she really is a bad driver; Trope, 1986).

Notwithstanding the focal role that Trope (1986) assigned to prior expectancies in his model, it is not totally clear what is predicted to occur when priors are at odds with behaviour.²⁸ One possibility, enclosed in the discussion of the conditions for an automatic and less controllable context-driven processing (Trope, 1998), is that if expectancies are not applicable (i.e., they do not match behavioural information) and behaviour is not ambiguous (only unambiguous behaviour can be at odds with expectancy, since ambiguous behaviour is reinterpretable), then social perceivers will engage in a more piece-meal, data-driven, and effortful processing to achieve behaviour identification. However, the operations or rules involved in such kind of processing are not formulated. Another possibility, derived from the idea that only un-reinterpretable behaviour can be inconsistent with prior expectancies, is that whenever the social perceiver encounters expectancy-inconsistent behaviour, the role played by situational and prior cues is minimal. This would occur because the behaviour does not need to be disambiguated and is diagnostic enough to produce a confident dispositional inference.

In light of this preceding work on prior expectancies it is somehow remarkable that the authors of the three-stage model of person perception (Gilbert, Pelham et al., 1988) do not refer to this variable at all in the presentations of the model. One possible reading of this fact is that the three-stage model, by incorporating Trope's model (1986), acknowledges the influence of prior expectancies (may they be situational, behavioural, or dispositional) on the categorization operation.

²⁸ For example, how the contrast effects obtained in choice conditions and with unambiguous stimuli by Jones and collaborators (1971) would be produced.

Another possible reading of the model is that it does not predict expectancy effects (Hamilton, 1998). An extended version of the social perception model was proposed by Gilbert & Malone (1995) in order to encompass other factors that have proven to be sufficient to produce the correspondence bias. In that extended model there was reference to two types of expectancies, namely to prior beliefs (e.g., perceiver's general beliefs about what kind of factors are determinants of behaviour) and to behavioural expectancies (i.e., outlines of the behaviour that the perceiver expects to see given the situation). The three-stage model, in the framework of the extended model of social perception, would thus represent the last stages of social perception and would account for the possible emergence of the correspondence bias even in those instances when prior beliefs, perception of the situation, behavioural expectancy, and perception of the behaviour were accurate. However, there was no mention to dispositional expectancies.

A final, and maybe the most probable, possibility is that the three-stage model, being a theoretical descendant of the correspondent inference theory (Jones & Davis, 1965), and explicative of the correspondence bias (which occurs even when prior expectancies are incongruent with the behaviour), does not address the expectancy issue because it is assumed to hold generally in all conditions, and particularly when the behaviour is *non-normative* or expectancy-incongruent.

Despite the fact that the role played by prior expectancies is not explicit in the constitution of the three-stage model, and since prior expectancies (e.g., schemata, stereotypes) are a central construct in a conception of the cognitive system as inherently constructivist and interactionist, it is worthwhile considering some possible ways in which prior expectancies can influence dispositional inferences.

Given the closeness between the three-stage model assumption of an automatic link between behavioural categorization and dispositional characterization sub-processes and the concept of spontaneous trait inferences (STIs), it should be informative to consider how prior expectancies impact on STIs. Until fairly recently, the bulk of research on STIs aimed at testing how the process performs against automaticity criteria (e.g., Ramos, 2009), which naturally drifts away from a more flexible, conditional, and context-dependent view (e.g., as implied by the consideration of expectancies) of the STI process. A number of paradigms have been used in the study of STIs, with unambiguous stimuli (i.e., sentences pre-tested to implicate unequivocally a certain trait) and the preclusion of dispositional expectancies (i.e., no additional information about the actor) being common features among these paradigms.

However, two exceptions are mention worthy in this context. Wigboldus, Dijksterhuis, and Van Knippenberg (2003) explored the impact of stereotype-based expectancies in the STI process. The authors added a category label (e.g., professor) to trait implicative sentences (e.g., does not know the answer) introducing thus an expectancy, which could be inconsistent, consistent, or irrelevant regarding the behaviourally implied trait (e.g., uncultured). The set of studies conducted by Wigboldus and collaborators (2003) strongly suggest that expectancies can inhibit the inference of inconsistent traits, leading to lower levels of STIs based on behavioural information. Even more recently, Ramos (2009) conducted a set of other studies, also using adaptations of commonly used paradigms for the study of STIs, but using actor's past behaviour as a way to induce dispositional expectancies in some of the studies. In line with Wigboldus and collaborators' results (2003), participants produced less STIs when the actor's last behaviour was inconsistent with the previous one, than when both behaviours were consistent with each other.

At this point it may be interesting to compare the STI results just described with *intentional* dispositional inference results presented by Weisz and Jones (1993) using category-based (i.e., stereotypes) and target-based (i.e., actor's prior behaviour) expectancies. On the one hand, Weisz and Jones obtained weaker dispositional inferences with inconsistent target-based expectancies, just like Ramos (2009) found for STIs. On the other hand, although Wigboldus and collaborators (2003) obtained an inhibition of STIs with an inconsistent category-based expectancy, Weisz and Jones (1993) did not obtain weaker dispositional inferences with that kind of expectancy. Weisz and Jones discuss their results in terms of differential attributional manoeuvres that social perceivers perform in face of information that disconfirms category- or target-based expectancies. Social perceivers are believed to attribute category-inconsistent behaviour to interpersonal differences, by subtyping for example (e.g., yes, she is a woman, but she is one of those women who sure know how to park), while attributing target-inconsistent behaviour to situational or transient factors, like mood for example (e.g., well, he usually parks easily, so maybe today he is not feeling well). Integrating the STI findings with Weisz and Jones' proposals, it can be the case that when prior expectancy is at odds with present behaviour a correspondent dispositional inference becomes less probable at an automatic level, but can be later resumed if perceivers dismiss prior expectancy as scarcely diagnostic (e.g., via subtyping - as applying to other group members, but not that one).

The empirical studies and theoretical proposals discussed so far conceptualize the impact of prior expectancies on dispositional inferences primarily in terms of strength.

Hamilton (1998), in contrast, deriving from evidence (coming mainly from person memory literature) that incongruent information is processed differently from congruent information, suggested that the match between prior expectancy and behavioural information may determine not only the degree to which a dispositional inference is drawn, but more importantly the type of processing that will ensue. Hamilton proposes that when there is a match between expectancy and perceived behaviour, a simple, heuristic and spontaneous form of processing will result in a dispositional inference, which will strengthen the expectancy, be easily integrated in the perceiver's impression of the actor, and will eventually be used as an attribution for that kind of behaviour if an attribution is asked for. Conversely, an analytical and more systematic type of processing will be triggered by inconsistency between expectancy and perceived behaviour, and can result in a dispositional or a situational attribution.

Hamilton (1998) concludes "that perceiver expectancies have effects on processing of behavioural information that are more likely to result in personal than in situational attributions" (p. 109) and from his theorising one can distil three cases against one, in which the correspondence bias would naturally follow: (1) if there is no prior expectancy, the correspondence bias can result via insufficient adjustment of the dispositional inference; (2) if there is a prior expectancy and behaviour is consistent with this expectancy, the correspondence bias can also emerge via accentuation of the dispositional inference; (3) if there is a prior expectancy and behaviour is ambiguous, the correspondence bias can occur via assimilation to the expectancy in behavioural identification; (4) if prior expectancy and behaviour are inconsistent with each other (and predictably this would occur only in a minority of cases), then attributional reasoning is triggered, the event is processed more analytically, and maybe situational explanations can result.²⁹

As noted earlier, the three-stage model can be plausibly conceptualized as generally holding its validity independently from prior expectancies. Nevertheless, considering the theoretical possibilities discussed in this section, namely that prior expectancies can inhibit or facilitate trait inferences, and/or can trigger different types of processing (e.g., inferential *vs.*

²⁹ However, as mentioned before, Jones and Harris (1967) obtained the correspondence bias even in this fourth case. Moreover, the already described work of Weisz and Jones (1993) did not observe more attributions to the situation, in strict sense, but to transient factors as the actor's mood, when target-based expectancy is incongruent with behaviour. Nonetheless, when Hamilton (1998) refers to situational explanations, he may be considering all non-dispositional explanations, including such transient factors.

causal), it would be enlightening to know exactly where and how the role played prior expectancies would be modelled in the framework of the three-stage model.

ALTERNATIVES AND CRITICISMS TO THE THREE-STAGE MODEL

The alternatives and criticisms to the three-stage model of person perception reviewed in the previous sections point to noteworthy complexities and complementarities in the field of person perception. However, as discussed in each section, none of the criticisms impacted directly the validity of the three-stage model. In the contrary, some of the reviewed empirical findings helped to establish useful distinctions that clarify the model assumptions and scope of application, as well as helped to complement and adjust the first formulations of the model.

This resilience to criticisms, though, is not the only grounds on which the large acceptance of the model in social psychology literature is based. Another important sphere is constituted by those studies that, not aiming to test the model, have nevertheless obtained results clearly convergent with the assumptions of the three-stage model. Some of these findings will be briefly discussed in the following sections.

2.2.6. CONVERGENT EVIDENCE CONCERNING THE THREE-STAGE MODEL

The studies presented by the authors of the three-stage model of person perception in support of their model (e.g., Gilbert, Pelham et al., 1988; Gilbert, Krull et al., 1988), as well as other studies of the literature mentioned so far, directly endow the participants with an inferential goal provided by the experimenter. It is only natural that participants draw a dispositional inference when asked about the actor (e.g., Gilbert, Pelham et al., 1988), a situational inference when asked about the situation (e.g., Krull, 1993), and a causal inference when asked to explain an event (e.g., Miller, 1984). This type of tasks allow to establish which intentional inferences social perceivers can draw and how they use the available information, but it does not allow to determine whether social perceivers draw any of such inferences spontaneously.

From the description of the three-stage model, one would predict that *categorization* and *characterization* inferences would occur rather spontaneously upon behavioural observation (based on the more automatic nature of these operations), and that causal

reasoning, involved solely in the *correction* operation, would be slower than dispositional inferences (based on the more effortful nature of the third operation). As stated in the previous paragraph, the studies reviewed so far focused on intentional inferences and hence could not assess these predictions. Yet findings originating in other paradigms, closely related to text comprehension literature, provided such convergent evidence for the validity of the three-stage model.

2.2.6.A) DISPOSITIONAL AND CAUSAL INFERENCE

In 1983, Smith and Miller analysed the quickness with which participants would draw several inferences from a behavioural statement. Their rationale was that slower inferences could not logically function as mediators of quicker inferences (e.g., if it takes longer to decide whether the driver was responsible for the parking difficulties than to take him for incompetent, then the latter dispositional inference could not have depended on the former causal judgement).

In the first of their two studies, for example, participants pressed a key when they had read and understood the stimulus behavioural description and were then presented with a question about that behaviour. The question could be whether the actor of the behaviour was male (i.e., control inference, presumably drawn during reading and comprehension), whether the actor could be described by a particular trait (i.e., dispositional inference), or whether the behaviour was caused by the actor or situation (i.e., causal inferences), among other questions. Participants had then to press a *yes* or *no* key as fast as possible. Study 2 was a close replication of the first study, with the reading and comprehension time of the questions (rather of the behavioural descriptions) being controlled for.

The surprising results of these studies, considering that the classical attribution theories were still prevalent, showed that participants inferred traits about the actor about as quickly as they reported the actor's gender. In contrast, participants were significantly slower to answer whether it was something about the actor or about the situation that had caused the behaviour. Smith and Miller (1983) discussed these findings suggesting that trait inferences may be done during, or very shortly upon, comprehension and, thus, possibly spontaneously. Causal inferences (both about the person or situation), on the other hand, not only do not mediate dispositional inferences, but they seem to be drawn more intentionally and at the expense of extra processing time.

Smith and Miller's results (1983) offer strong convergent evidence for the conceptualization of the temporal primacy of dispositional inferences over causal attributions, as proposed in the three-stage model. Moreover, by showing that trait inferences occur as quickly as gender inferences, which are believed to be spontaneous and involved in the comprehension process, these results speak for the validity of the model beyond the scope of deliberate and explicit dispositional inference tasks. However, in Smith and Miller's studies the inferences were still produced upon request and are thus reported intentionally. The next section will be devoted to strictly spontaneous inferences.

2.2.6.B) SPONTANEOUS TRAIT INFERENCE

Other pieces of convergent evidence with the assumptions of the three-stage model of person perception come not from isolated studies, but from a whole body of literature on spontaneous trait inferences (STIs).

As mentioned before, Gilbert, Pelham, and Krull (1988), when presenting the model, cited what was then recent evidence suggesting that trait inferences were outputs of a very basic cognitive process (Winter & Uleman, 1984; Winter et al., 1985). In one of the first studies of this line of research, Winter, Uleman, and Cunniff (1985) succeeded to demonstrate in a single experiment that trait inferences can be drawn from behaviours without intention, awareness, and interference from a cognitive resource competing task. The authors conjectured that merely attending to a behavioural description of an actor (e.g., the professor invites the newcomers to his house) would be sufficient for participants to draw a trait inference (e.g., friendly). Logically, participants could not be instructed with an impression formation or dispositional inference goal because then trait inferences would not occur spontaneously, but upon request. Another goal, traditionally via memory instructions (e.g., Winter & Uleman, 1984), would serve the purpose of studying STIs, but it could still be argued that participants extract the traits implied by the behavioural descriptions as a way to elaborate more deeply, and thus recall better, the presented behaviours. So, in Winter and collaborators' study (1985) participants were instructed to memorise easy or difficult strings of digits, and the behavioural descriptions were introduced as distracter stimuli, which subjects had to read before they could report the memorized numbers. This procedure ensured that participants would attend to the behaviours, along with providing them no grounds to consider the sentences as worthy of further elaboration. After 16 trials, at the supposed end of

the experiment, participants were given a questionnaire to assess their awareness of the inferences eventually drawn from the behavioural descriptions, and finally a cued-recall response sheet. The cued-recall measure derives from the principle of encoding specificity (see Tulving & Thompson, 1973), which states that material that accompanies focal information at encoding will be stored together with that information and may later serve as a retrieval cue. Winter and collaborators' (1985) reasoned that if a trait is inferred while attending to a behavioural description, then it could serve as an efficient recall cue for that behaviour.

Results of this study helped picture the STI process as a quite automatic one. First, trait-cues (e.g., friendly) were more effective for the recall of the associated behaviours than cues semantically related to the actor's occupation (e.g., teacher) and no cues at all. Since participants had no explicit intention of inferring actors' dispositions, and yet traits outperformed other cues at the recall measure, this result was taken as a convincing indication that participants spontaneously inferred traits. Second, participants' answers and ratings in the awareness measure contained little indication that participants were aware of having inferred traits. Finally, although participants' recall of the difficult strings of digits was poorer than of the easy ones, indicating that the first task was cognitively more demanding, the levels of trait-cued-recall were not significantly lower in this condition. This result speaks for the efficiency of the process of trait inference.

Since the first demonstrations of STIs, a lot more research has been conducted around the topic (see e.g., Uleman, Newman, & Moskowitz, 1996; Uleman, Saribay, & Gonzalez, 2008). Different paradigms allowed to study this type of inferences more thoroughly and to address alternative assumptions about the process. Generally, one can conclude that STIs are not unconditional consequences of exposition to behavioural information, but rather the products of a flexible cognitive process (Ramos, 2009; Uleman et al., 1996). Research has shown that social perceivers draw trait inferences even when they have no explicit intention of forming an impression about the actor, even if few (but not too few) cognitive resources are available, even when such inferences impair their performance at other tasks (e.g., Uleman, Hon, Roman, & Moskowitz, 1996), and even when they have no awareness of having done so. All this evidence converges with the assumptions of the three-stage model of person perception.

There is some debate as whether STIs refer to actors (i.e., are *characterizations*) or merely to behaviours (i.e., are *categorizations*; e.g., Uleman et al., 1996). While STIs drawn from behaviour are clearly distinguishable from intentional full-blown dispositional

inferences about the actor (e.g., Uleman, 1999), some evidence seems to indicate that STIs are linked to actors (e.g., Carlston & Skowronski, 1994; Todorov & Uleman, 2002). The eventual outcome of this debate in one or the other direction, however, will not have strong implications for the three-stage model, since it was assumed from the beginning “that in some senses characterization ... is much more like categorization ... than it is like correction” (Gilbert, Pelham et al., 1988, p. 734).

It has also been shown that trait inferences are but one type of spontaneous inferences. Other types include situational inferences (e.g., Lupfer, Clark, & Hutcherson, 1990), gist inferences (e.g., Winter et al., 1985), and predictive inferences (McKoon & Ratcliff, 1986) among others, and these kinds of inferences have been shown to occur independently from STIs (see Uleman et al., 1996). These findings also harmonize fairly well with the three-stage model, especially when considered in its more flexible format, which encompasses intentional situational inferences. Upon observation of a behaviour, the social perceiver may draw multiple spontaneous inferences. Chronically accessible constructs may render the occurrence of certain inferences more probable, but the epistemic goal of the perceiver will dictate which inferences will be inhibited, and which will be integrated in a final representation. Still, 25 years of research on STIs have shown that people tend to derive traits from trait-implying behaviours even when not asked to do so, which provides strong convergent evidence for the validity of the three-stage model of person perception.

In fact, more than representing convergent evidence for the model, the findings discussed in the previous sections expand the plausibility of the model to the realm of the spontaneous, more ordinary, processing of information. Studies on the social perceiver’s epistemic goals (e.g., Krull, 1993) have shown that person perception processes are flexible and can work with different types of initial inferences, upon request. Studies on STIs, on the other hand, have shown that it is very plausible that, when there is no specific request, the perceiver will draw a trait inference based on what is *visible* (i.e., based on behaviour, at least when the behaviour is trait implicative), just like the original form of the model suggested.

In the preceding sections of this chapter, a number of questions relating to the three-stage model of person perception have been reviewed from a *social psychology* perspective. These topics included the historical context in which the model arose, the empirical effect it explains, the very composition of the model, some criticisms towards the model, and some convergent lines of research. However, since the aim of this part of the research project

consists of testing an *ontogenetic* prediction derived from the model, the theoretical framework outline would not be complete without a brief review of the *developmental* perspective on person perception.

2.2.7. DEVELOPMENTAL EVIDENCE ON PERSON PERCEPTION

Generalizing across a variety of studies and reviews in developmental literature on person perception (e.g., Pomerantz & Newman, 2000; Rholes, Newman, & Ruble, 1990; Ross, 1981; Ruble & Dweck, 1995), there is a widespread depiction of young children, usually under 7-years-old, as essentially *situationists* (i.e., relying heavily in contextual factors and ignoring dispositional factors), of older children, over 8-years-old,³⁰ as *dispositionalists* (i.e., referring more to stable psychological characteristics of the actor and applying them in more strict and rigid ways), and of young adults as *interactionists* (i.e., considering preferentially an interaction of dispositional and situational factors).

Evidence for this type of characterization of age-related changes in social perception, namely an inverted-U pattern of *dispositionalism*, is usually cited as coming from three types of studies: (1) studies on behaviour explanation, (2) free description studies; and (3) studies of behavioural prediction. A brief review of the findings originating from these types of studies and their eventual implications concerning the three-stage model follows.

However, the studies that relate more closely to the three-stage model are dispositional inference studies, and they suggest a somewhat different developmental pattern. A brief review of this type of studies closes the section dedicated to developmental evidence on person perception.

2.2.7.A) BEHAVIOUR EXPLANATION STUDIES

Behaviour explanation studies (e.g., Miller, 1984, 1986; Ruble, Feldman, Higgins, & Karlovac, 1979) typically ask participants to explain why an actor behaved in a certain way, may it be in terms of open-ended questions (e.g., “Why did s/he do it?”) or by choosing between alternative explanations (e.g., “Was it something about the person or about the

³⁰ From individualist cultures.

object?"). This type of studies generally shows that younger children refer more contextual and more concrete rather than dispositional and more abstract factors while explaining behaviours of others, and this has been interpreted as an indicator that young children tend not to draw dispositional inferences.³¹

However, as previously mentioned, this type of task is essentially attributional, while the three-stage model concerns, and was tested in the framework of, inferential tasks. Evidence obtained in developmental explanation studies (inline with what has been shown cross-culturally and with situational inference goals) may show that the fundamental attribution error is not ubiquitous (i.e., young children underestimate personal causes relatively to situational causes), but it does not establish whether children draw dispositional inferences from situationally constrained behaviour. As such, findings originating in this type of paradigms cannot inform the three-stage model of person perception.

2.2.7.B) FREE DESCRIPTION STUDIES

Free description studies (e.g., Aboud & Skerry, 1983; Livesley & Bromley, 1973) require participants to produce verbal accounts of their impression of someone, may it be of others or about the self (e.g., "Describe what sort of person they/you are"). Typically, in this type of studies, younger children do not spontaneously characterize people in dispositional terms, listing other types of attributes related to "appearance, identity, possessions and family" (Livesley & Bromley, 1973, p. 147), for example. A pronounced change occurs between 7- and 8-years of age, when children begin to include some psychological aspects in their descriptions, followed by a steady increase in the use of trait terms. Adolescents' descriptions comprise references to situational factors, not as details like in younger children's descriptions, but integrated in the personality impressions, suggesting that the adolescent "is aware (implicitly) that behaviour is a function of the total situation" (p. 221).

Although this type of study, as the previous one, allows for the collection of a rich data set, it is very demanding on participants' verbal skills. In the classical and thorough work by Livesley and Bromley (1973), for example, participants were asked to write their descriptions.

³¹ Miller's results (1984, 1986) do not match perfectly the just described inverted U-shape of dispositional attributions, since her youngest participants were 8-years-old and preferred contextual explanations. Moreover there was an age-related linear trend towards increasing dispositionalism in her western participants. Notwithstanding, her studies are commonly cited as demonstration that children adhere more to situational explanations than adults.

Naturally their participants were no younger than 7-years-old, but it is not clear how such a highly demanding task may affect performance. Even in the cases when participants are supposed to deliver their descriptions orally, it is not clear how differently-aged children interpret the task instructions (i.e., it is hard to establish whether young children understand that they are expected to produce descriptions of how someone is like from the psychological or personality point of view). The high and uneven level of demand of these tasks not only may lead to an underestimation of young children's understanding of traits at a conceptual level (Rholes et al., 1990), but also render drawing conclusions about dispositional inference (as conceptualized in the three-stage model) very difficult.

2.2.7.C) BEHAVIOURAL PREDICTION STUDIES

Behavioural prediction studies (e.g., Newman, 1991; Rholes & Ruble, 1984; Ross, 1981) typically present participants with some trait implicative behaviours performed by an actor (e.g., behaviours implying that a boy is either *bold* or *timid*). Then participants are asked to predict the actor's future behaviour, usually by choosing between presented alternatives, in another trait relevant situation (e.g., when the boy meets a *fierce* or a *friendly* dog). Studies of this type commonly show that young children do not predict an actor's future behaviour to be consistent with the actor's previous trait-implicative behaviour, suggesting that the implied traits have low significance for young children.

Findings originating in this type of studies, relatively to the previously described ones, could have more implications concerning the three-stage model of person perception, once dispositional inferences are believed to play an important role in behavioural prediction. In social psychology literature, for example, measures that require participants to predict behaviour have been referred to as the most adequate measures of full-blown dispositional inference (e.g., Ross, 1977; cf. Gilbert & Malone, 1995), in contrast, for example, to *hydraulic* types of measure (e.g., rating scales anchored in person-situation labels). However, the use of prediction measures with young children raises a specific problem related to the mastery of a theory of mind (TOM) and to the related cognitive egocentrism that characterizes preschool-aged information processing, rendering them more dubious as dispositional measures.

The relations between TOM and person perception are so intertwined that Wellman, Cross, and Watson (2001) state that “theory of mind describes one approach to a larger topic:

everyday or folk psychology – the construal of persons as psychological beings, interactors, and selves” (p. 655). A wide range of studies and theoretical debate have revolved around which criteria should be met so that one can say that the child already has a TOM, and at what age is TOM acquired (e.g., Lourenço, 1997). The classic, and also more stringent, criterion refers to meta-representation (i.e., the ability to understand that mental representations may not correspond to objective reality, and that representations, not external reality, guide behaviour), and the most commonly used experimental paradigm to measure meta-representation ability is the false-belief task (for a meta-analysis on false-belief studies see Wellman et al., 2001). In this paradigm, originally presented by Wimmer and Perner (1983), participants witness a change in objective reality in the absence of the main character of the story (e.g., a boy had put chocolate in a cupboard, but his mother, while he was away, moved it to a drawer). Participants are then asked to report what the main character will do (e.g., where will the boy look for the chocolate) and their responses indicate whether participants are still bound to external reality and their own perspective (by answering that the boy will look in the drawer), or whether they already understand that others may represent the reality differently (by answering that the boy will look in the cupboard). Usually 3-years-old children give the first type of answer, while 4- and 5-year-olds give more consistently the second type of answer, which supports the idea that the acquisition of TOM derives from a conceptual change during preschool years (Wellman et al., 2001).³²

However, the acquisition of TOM can hardly be conceptualized as an all-or-nothing phenomenon [SEE FOOTNOTE 32] and it should be noted that (a) some 5- and 6-year-olds still err in false belief tasks, (b) it seems fair to suppose that even those 4- to 6-year-olds who succeed in the task still have rather tentative and naïve TOM, and that (c) 4- to 6-year-olds still have difficulties in perspective taking tasks, responding to laboratory created situations according to their own perspective and not another’s perspective, as demanded in such tasks (e.g., Epley, Morewedge et al., 2004; Piaget & Inhelder, 1948).

These considerations are relevant concerning behavioural prediction studies because, while young children are increasingly able to understand that others may perceive, represent, and react to the world differently than they themselves do, this ability is not yet fully developed and solidified. Hence, it should be quite expectable that in a variety of situations

³² As mentioned before different criteria for the attribution of TOM to a child can be used and, depending on the criterion, the age of acquisition may vary markedly. For example, 9-months-old infants seem capable of reading others’ intentions (Behne, Carpenter, Call, & Tomasello, 2005) and under 3-years of age children are capable of inferring emotional states, desires, motives, and other mind-related concepts (see e.g., Reeder, 2009), as well as they are able of engaging in symbolic play and purposeful deceit of others (e.g., Chandler, Fritz, & Hala, 1989)

children still predict behaviour of others based on their own perspective (e.g., on what they themselves would do in the presented situation) and on concrete *external* information (e.g., data referring to the *entity* in Kelley's terminology, 1967) and not on internal abstract characteristics of others, which they have to extract from previous behaviour.³³

Consistent with this proposition, there is evidence that children's predictions of their own behaviours are aligned with predictions of others' behaviours (e.g., Ross, 1981), and that, in general, self and other perception seem to develop in a close parallel, at least until a certain age (e.g., Livesley & Bromley, 1973; Rotenberg, 1982). In the paradigmatic study "boy meets dog" described by Ross (1981), for example, virtually all children predicted that they themselves would run away from the *fierce* dog, but not from the *friendly* one. This means that younger children (5-year-olds) predicted the same behaviour for the target boy and themselves, while older children and adolescents predicted the actor's behaviour according to the disposition and their own behaviour according to the situation. Furthermore, a variety of methodological details have been shown to heighten or lessen the consistency of children's predictions with the actor's previously presented behaviours, suggesting that children's predictions are still very permeable to the salience and concreteness of certain factors (regarding the actor, the entity, or the circumstances; e.g. Heller & Berndt, 1981; cf. Rholes et al., 1990).

The idea that children may predict another actor's behaviour from their own perspective and the previously cited evidence that young children seem to favour contextual factors over dispositional ones also harmonise fairly well with an attributional effect commonly designated by actor-observer divergence, bias, or asymmetry. This effect was originally discussed by Jones and Nisbett (1972) and it refers to the actors' tendency "to attribute the causes of their behavior to stimuli inherent in the situation, while observers tend to attribute behavior to stable dispositions of the actor" (p. 93). One of the most cited illustrations of this effect is a study by Storms (1973), in which participants could be the actors in a getting acquainted conversation or the observers of this interaction. Storms not only obtained the actor-observer divergence on causal attributions regarding the behaviour during the conversation, but he was also able to reverse the effect by showing actors a

³³ In adult literature there is a related debate whether social perceivers predict and explain behaviours of others using a common-sense psychological theory (*Theory Theory*) or mental simulation (*Simulation Theory*). Simulation Theory (e.g., Gordon, 1986, 1992) shares a lot of features with the above proposed hypothesis that children may be predicting behaviours from their own perspective, applying something like "total projection" (Gordon, 1992, p. 13). Egocentric biases in behavioural prediction by adults, like the false consensus effect (Ross, Greene, & House, 1977), support the idea that initial (child-like) egocentrism in prediction may be better conceptualized as corrected, not substituted, by later (adult-like) perspectivism.

videotape of themselves while speaking and observers a videotape of the other interlocutor, just like the actor had seen him during conversation. A recent meta-analysis (Malle, 2006) did not find support for the robustness nor pervasiveness of the actor-observer divergence, except for under certain specific conditions. However, the idea that young children, when asked to predict an actor's behaviour, cannot entirely escape their own perspective (due to incipient TOM and cognitive egocentrism), functioning thus as if they were the actor (not the observer) and favouring contextual factors, remains plausible.

YOUNG CHILDREN AS SITUATIONISTS

The developmental evidence reviewed so far pictures younger children (under 7-years-old) as situationists rather than dispositionalists. From that perspective it would be natural to assume that if children begin by regarding situational factors as determinants of behaviour and have difficulties in assigning dispositions to people, then situational characterization (rather than dispositional characterization) would become ontogenetically overlearned and automatized. However, and exactly as it was argued concerning goal- and culture-related differences, even if young children do prefer to draw situational inferences from observed behaviour, this fact does not invalidate the three-stage model of person perception. A flexible version of the model, in which the first inference can denote a dispositional or a situational characterization (e.g., Krull, 1993; Lieberman et al., 2005), accommodates for such a preference. In fact, within the scope of this more goal-oriented model, one could interpret the above mentioned developmental evidence as suggesting that young children's chronic epistemic goal is directed at understanding the world (i.e., in its concrete events and situations) and only then, after most situations have become meaningful and familiar, do children adopt an epistemic goal more centred on understanding others.³⁴ From inception, thus, social perception skills (i.e., behavioural interpretation) would be very important, but at earlier ages these skills would serve the development of a solid knowledge structure about situations and only later would they be applied to understand others and predict their behaviour.

³⁴ This is consistent with the finding that when children (5- to 6-year-olds) are directly motivated to know/understand the other person (e.g., via manipulation of future interaction goals), they produce more dispositional inferences (Feldman & Ruble, 1988)

As pointed out in the previous sections, however, the reviewed studies are not conclusive as to whether children are able to, and do, draw dispositional inferences from behaviour (constrained or not). Either because the tasks were not purely inferential (e.g., assigning causes to behaviour), or because specific characteristics of young children's cognitive functioning (e.g., lower verbal sophistication, cognitive egocentrism) can be responsible for age-related differences, behaviour explanation, free-description, and behavioural prediction studies have little relevance for the three-stage model. In the next section, dispositional inference studies that concern more directly the three stages of the model will be briefly acknowledged.

2.2.7.D) DISPOSITIONAL INFERENCE STUDIES

- (1) *Categorization* - Young children (4-years-old and above) seem to have a “reasonably well-developed personality trait vocabulary” (Rholes et al., 1990, p. 373) and to be able to apply it adequately upon the presentation of trait implicative behaviours. An aforementioned prediction study by Rholes and Ruble (1984) has shown that young children (5- and 6-year-olds) are able to indicate whether a given trait label can be used to describe a behaviour and its actor, and that their ratings of the degree to which the behaviour was implied by the behaviour do not differ from older children's (9- and 10-years-old) ratings. The same study shows that both young and older children can correctly choose the trait that was implied by the behaviour, from a set of three trait labels. In another study by Liu, Gelman, and Wellman (2007), younger children (4-year-olds) were also able to accurately decide whether a certain trait was implied by the presented behaviour and to which extent, but in this study consistency in trait label inference improved linearly with age (older children were 9-year-olds).

- (2) *Characterization* – The results presented in the previous paragraph show, not only that young children can label adequately behaviours with trait terms, but they show more precisely that young children can characterize the actors of those behaviours with trait labels, if asked to do so. In fact, in both study sets children were asked if the actor of the behaviour could be characterized by the trait or which trait described better the actor. The results were presented under the categorization operation, in order to keep in line with the way the authors discuss them. Rholes and Ruble (1984), particularly, would

assume that a dispositional inference has occurred only if participants predict cross-situationally or temporally consistent behaviour, which was not the case for younger children [SEE SECTION 2.2.7.C]. Hence, the authors present the correct labelling data more as a case of correct categorization than of correspondent characterization. Within the three-stage model assumptions, however, it seems that children's responses to labelling tasks can be taken as evidence of both operations.

Moreover, in Heyman and Gelman's studies (2000) young children (3- and 4-year-olds) relied more on trait labels than on physical similarity between actors while drawing psychological inferences and in Liu and collaborators' studies (2007) young children (4-year-olds) predicted an actor's behaviour to be consistent with a trait used to describe her/him. This latter finding, especially, was unexpected considering the difficulty of young children in predicting behaviour consistently with previous behaviour. The authors discuss the finding in terms of trait-to-behaviour predictions being only one component of the more complex process of making behaviour-to-behaviour predictions.³⁵ It is not clear, however, why Rholes and Ruble (1984) did not obtain similar results for children in the *labelling condition*, since these participants also characterized the actor in trait terms before predicting her or his behaviour. Notwithstanding these empirical inconsistencies, evidence suggests that children as young as 4-years-old are able to make correspondent inferences from behaviour upon request.

- (3) *Correction* – Young children (5-year-olds) seem to have difficulty at applying the discounting principle. Smith (1975) presented kindergarteners, second-, and fourth-graders, and college students with pairs of behaviours. One of the behaviours was unconstrained, thus diagnostic of the true attitude of the actor (e.g., preference for a specific toy), while the other behaviour was constrained by a command (e.g., to play with a specific toy) or a reward (e.g., a piece of cake if the actor plays with a specific toy) offered by the actor's mother. Participants had then to choose which of the actors had a more positive attitude towards the specific toy, to assign causes for the actors' behaviours, and to rate the actors' attitudes towards the objects in rating scales. Across all measures, kindergarteners did not seem to have applied the discounting principle,

³⁵ The first component would be behaviour-to-trait inferences, which, as mentioned before, was also successfully mastered by 4-year-olds. The studies did not allow, however, to understand why these children do not make consistent behaviour-to-behaviour predictions, when they make consistent behaviour-to-trait and trait-to-behaviour inferences (Liu et al., 2007).

while second-graders may have applied it sometimes and fourth-graders almost always. Karniol and Ross (1976), using Smith's paradigm (1975), developed two further studies and kindergarteners again failed at applying the discounting principle, choosing more consistently the constrained actor as having the most positive attitude towards the object.

Another study by Baldwin and Baldwin (1970), on children's understanding of the trait *kind*, obtained consonant results. Participants, once again, heard about two actors and were asked to judge for each pair of actors which one was the kindest. In one pair of behaviours one of the actors spontaneously shared his toys with his brother, while the other actor did the same thing after his mother asked him so. Although, from a normative point of view, obedience could concur with kindness to explain the second actor's behaviour and should, thus, be discounted, a significant percentage of kindergarteners elected the obedient actor as kinder than the spontaneously altruistic actor.

These results suggest that young children have difficulties in applying the discounting principle, although some studies that included modifications to the Smith's paradigm (1975) obtained inconsistent results (e.g., Kassin & Ellis, 1988; Newman & Ruble, 1992). Conversely, the above discussed data suggest, though also not always consistently (cf. Newman & Ruble, 1992), that kindergarteners tend to apply an additive heuristic to such problems (i.e., situational pressure and behaviour together result in a more extreme dispositional inference). These studies share remarkable similarities with the attitude attribution paradigm. Nevertheless, children were asked to consider always two behaviours and two actors, which can be a more demanding task than inferring just one disposition from one presented behaviour.

The importance of developmental evidence on person perception for the validation of the three-stage model should be apparent from this brief review. On the one hand, evidence that is frequently cited as representing a defying issue for the development of the correspondence bias, is easily accommodated in a model that assumes that the social perceiver can draw situational, and not only dispositional, inferences from behaviour on a more immediate basis. On the other hand, the existing evidence that relates more closely to the three-stage model seems to support the idea that young children are able to categorize behaviour appropriately and to characterize the actor (albeit often not spontaneously), but still do not use situational information to correct dispositional inferences. Nonetheless, the

developmental studies that used dispositional inference measures more similar to the adult studies (e.g., rating scales), did not include instances of situationally constrained behaviour and, conversely, studies that included constrained behaviour employed dispositional inference measures that are quite different from adult literature (e.g., choice between actors).

Hence, a more definitive ontogenetic test of the three-stage model is still in order. In addition to the previously presented more general reasons to such a test (e.g., an end-state model should harmonise with developmental data, the automatic components of a corrective model should emerge ontogenetically earlier) [SEE CHAPTER 1], existing developmental data seem to be inconsistent at some points and fairly inconclusive for the validity of the model.

2.2.8. SUMMARY AND HYPOTHESIS

Summing up, the theory-to-data part of the dissertation aims at illustrating how research conducted with children can be valuable for the (in)validation of end-state social cognitive models. The focal model of this part of the research project is the three-stage model originally proposed by Gilbert, Pelham, and Krull (1988) to describe person perception processes and to account for the correspondence bias.

The three-stage model was preceded by a social psychological approach to causal attribution, which defined the logical *principles* that the social perceiver should follow when trying to infer an actor's disposition from his/her behaviour. One of these central principles was that the perceiver should infer a disposition only if the cause of the behaviour could be attributed to the actor. This approach produced the so called classical attribution theories (e.g., Heider, 1958; Jones & Davis, 1965; Kelley, 1967).

However, several empirical studies have shown that social perceivers draw dispositional inferences even from situationally induced behaviour (e.g., Jones & Harris, 1967), meaning that the social perceivers exhibit the correspondence bias.

The three-stage model was also preceded by information processing models (e.g., Quattrone, 1982; Trope, 1986), which were proposed under a social cognitive approach to person perception. These models sought to describe the functioning of the *processes* that are actually operating in the human mind. A distinctive mark of these models lies in the fact that they conceptualize dispositional inference processes as not dependent of causal attribution processes, and can thus account for normative deviations like the correspondence bias.

Basically, the three-stage model of person perception assumes that the social perceiver will categorize the observed behaviour and characterize the actor of that behaviour in an automatic and correspondent manner. Only after producing that dispositional inference will the perceiver use available situational information to effortfully correct it.

The robustness of the three-stage model can be appreciated by the direct empirical support it has received, but also from its power to integrate alternative theoretical proposals, to accommodate for seemingly defying empirical findings, and to converge with findings from parallel areas of study.

Developmental evidence on person perception has mixed results concerning young children's ability to perform dispositional characterizations. These inconsistencies may derive from some confusion between essentially attributional and essentially inferential studies. Developmental studies on the application of the discounting principle suggest that younger children fail to apply situational correction.

Resuming the ontogenetic prediction outlined in the previous chapter [*SEE SECTION 1.3.2*] and applying it to specific context of the three-stage model of person perception, the studies described in the following section [*SECTION 2.3*] were conducted in order to test the hypothesis that, under a dispositional inference goal, younger children will tend to draw dispositional inferences not yet corrected by the consideration of situational constraints, while older children and adolescents will already exhibit situational correction over dispositional inferences. As discussed before, this hypothesis derives from the differential operating characteristics assumed by the three-stage model to underlie characterization (automatic and association-based) and correction (deliberate and rule-based) processes.

Study 1 and Study 2 were designed to test the ontogenetic prediction derived from the three-stage model of person perception, which states that the situational correction operation should have a later ontogenetic onset than the dispositional characterization operation. To achieve this, in Study 1 we adapted the *silent interview* paradigm (Snyder & Frankel, 1976) and in Study 2 the *attitude attribution* paradigm (Jones & Harris, 1967) to its use with children. As detailed earlier [SEE SECTION 2.2.4], these two paradigms were used in the first empirical tests of the three-stage model (Gilbert, Pelham et al., 1988) and provide a solid framework to test intentional dispositional inferences about an actor, based on either non-verbal (silent interview paradigm) or verbal (attitude attribution paradigm) behaviour.

Study 2b consists in a replication of Study 2a conducted with a sample of participants with different characteristics.

Study 3 was designed to enlighten the eventual impact of prior expectancies in dispositional inferences across the different age groups, within the attitude attribution paradigm.

2.3.1. STUDY 1 – THE SAD CHILD

The aim of the first study of the *theory-to-data* part of this research project is to test the hypothesis that young children, upon the observation of a behaviour, will dispositionally characterize an actor without taking situational constraints into account, whilst older children will use situational information to adjust dispositional characterizations. Since this hypothesis was derived from the theoretical assumptions of the three-stage model (i.e., its dualistic and corrective nature), its validity is not dependent on specific age-levels, but rather on the contrast between judgements of younger and older children. As such, the specification of the age-levels (here in the form of grade-levels) to include in the study was primarily led by a combination of pragmatic reasons and the consideration of broad developmental characteristics:

- (1) Preschoolers were selected as the *young children* group because they are old enough to allow for an adaptation of the paradigm that retains a number of features of the original paradigm (e.g., rating scales, tasks) and that remains plausible for older ages (e.g.,

instructions). Simultaneously, preschoolers are still not schooled in the more formal and strict sense, which in some reasoning domains is conceived as being associated with less rule-based processing (e.g., Scribner & Cole, 1973). From the developmental evidence reviewed in previous sections of this chapter, preschoolers have also been shown to be able to categorize behaviours and characterize actors in trait terms.

- (2) Sixth-graders were chosen as the *older children* group because they are still young enough to warrant the label *children* and are simultaneously the oldest grade-level before entering a secondary education program. Preschoolers and sixth-graders are, thus, of particular interest to the test of the ontogenetic hypothesis.
- (3) Second- and ninth-graders were included in the study as the *middle childhood* and *adolescents* groups to give a more comprehensive view over eventual age-related changes.
- (4) Undergraduates, as *adults*, participated in the study, in order to test the adaptation of the paradigm. The adaptation would be questioned if adults' data would not conform to the findings that are usually obtained with adults in the original paradigm.

OVERVIEW

Participants watched a short silent video featuring a target-child who appeared sad [*behavioural information*]. They were informed of the topic that the target-child was speaking about [*situational constraints*], since they could not listen to the target's actual words. In one of the experimental conditions, participants learned that the topic was happiness-inducing [*gift condition*] and in the other condition that the topic was sadness-inducing [*punishment condition*]. After watching the video, participants were asked to make *dispositional judgements* about the target along a sad-happy dimension and some *behavioural predictions* along the same dimension. Lastly, participants' understanding of the situational constraints was assessed.

It was expected that older children, adolescents, and adults would consider the target-child dispositionally sadder when his/her sadness could not be explained by the discussion topic (i.e., in the gift condition). Conversely, younger children were expected to rate both conditions similarly, much as cognitively busy participants in the original study did (Gilbert, Pelham et al., 1988), because in both cases the *corrective component* would not be fully operating.

2.3.1.A) METHOD

Participants

Participants in this study were 30 preschoolers, 30 second-graders, 30 sixth-graders, 32 ninth-graders, and 30 undergraduates. Major demographic characteristics (age and gender) of each grade-level are summarized in Table 1.

Children and adolescents were students at a medium-high socioeconomic status private school in the area of Cascais (near Lisbon). Upon authorization and coordination with the school board of directors, consent forms were sent home for interested parents to sign. Before data collection, the experimenter checked with each participant his/her wish to participate in the study. Adults were students at the University of Lisbon, attending to different undergraduate courses. They were recruited individually by the experimenter at a terrace or at the library of the Science Faculty.

Grade	Age			Gender	
	<i>M</i>	<i>SD</i>	<i>[min; max]</i>	males	females
preschool	5y 4m	3m	[4y 11m; 6y 0m]	11 (37%)	19 (63%)
second	7y 11m	4m	[7y 4m; 8y 5m]	14 (47%)	16 (53%)
sixth	11y 5m	4m	[10y 10m; 12y 1m]	21 (70%)	9 (30%)
ninth	14y 6m	4m	[14y 1m; 15y 2m]	12 (38%)	20 (62%)
undergraduate	21y	2y	[18y; 26y]	14 (47%)	16 (53%)

Table 1: Descriptive statistics concerning age (mean, standard deviation, minimum and maximum values) and gender (frequencies and percentages) of Study 1 participants

Note. All n=30, except for 9th-grade (n=32). y = years, m = months.

Material

Two short videos (about 30 sec long) were edited for this adaptation of the silent interview paradigm. Each video featured a close up of a target-child (a girl or a boy) speaking with a sad facial expression.³⁶ The two versions (i.e., female and male) were produced because gender categories tend to be very salient to children (e.g., Ruble, Martin, & Berenbaum, 2006) and are treated, particularly by young children, as having essential differences (e.g., Taylor, Rhodes, & Gelman, 2009). This is to say that in Study 1 female participants watched the female version of the video, while male participants watched the male version, in order to avoid eventual differences in reasoning introduced by a gender

³⁶ Still images drawn from the videos can be found in Appendix A.

ingroup/outgroup differentiation. The excerpts were taken from commercial movies, not very renowned films (nor actors) in Portugal at the time. The soundtrack was deleted from the video, so that it was impossible to understand what the target-children were saying. The videos were presented on an ASUS laptop running Windows Media Player.

The two videos were pre-tested to establish whether the behaviour of the target-children was categorized as revealing sadness. The details of this pre-test can be found in Appendix B. The results of the pre-test study show that participants of the same grade-levels as the participants of Study 1 clearly categorized the behaviour of the target-children as sad. There were no age-related differences on their ratings. The female target was rated as feeling sadder than the male target, but importantly both targets' behaviour was rated as different from the midpoint of the scale.³⁷

Noteworthy differences in relation to the video used by Gilbert, Pelham, and Krull (1988 – Study 1) are: (a) The original focal trait was *anxious*, not *sad*. The option of replacing *anxiety* with *sadness* derives from the fact that sadness and happiness are among the emotions that children first correctly label, based both on facial expressions and emotionally laden situations. Conversely, the emotion *nervousness* has proven to be especially hard for children to grasp (e.g., Brody & Harrison, 1987).³⁸ (b) The original video was a composite of *seven* clips, and the target-woman displayed both *anxious* and *relaxed* behaviour, instead of just *one* clip with no behavioural variability. Because there was no theoretical reason underlying the choice of presenting multiple clips in the original study and because it seemed to be unnecessarily complex for children to have to manage multiple events, the choice was made to present just one clip. Moreover, in the pre-test of the video young children did not seem to have difficulty in imagining behavioural alternatives for the target-child, since they rated the child as being dispositionally quite happy. (c) In Gilbert, Pelham, and Krull's study, the conversation topics appeared (in subtitles) *during* the behaviour presentation, whereas in the present study the topic was stated *before* the presentation of the behaviour. While it was a necessity in this study that the information would be presented orally, and the most plausible way to do it, without distracting the participants' attention from the video, would be to state the topic immediately before the video, it should be acknowledged that this option may have facilitated that behavioural information was assimilated to situational information (i.e., the target-child may have been perceived as behaving sadder when talking about a punishment

³⁷ Results can be found in Appendix B.

³⁸ Moreover, the trait *sad* has been previously used also in the test of the three-stage model (Gilbert, Krull et al., 1988 – Study 1).

than when talking about a gift; Snyder & Frankel, 1976; Trope, 1986). (d) The original video consisted in only *one* version, namely the female, but participants in the reference study were all females. In the present study *two* versions were created to match participants' gender, for the above mentioned reasons.

Procedure

Preschoolers were escorted to a small testing room in their school by the experimenter, who used this time to engage in a warm-up conversation. Second-, sixth-, and ninth-graders were sent to the testing room by the teacher who was giving class. Undergraduates were escorted to a secluded table, either in the library or in the terrace of the faculty. All sessions were individual and run by the same female experimenter. After participants had confirmed (or given) their consent to participate in the study, they stated their birth date (or age in the case of preschoolers, who often did not know the birth date³⁹), while the experimenter noted this information along with gender and grade-level in the first page of the coding booklet.

Participants were then told that the study consisted of two different parts. In the first part they would watch a short video and answer questions on what they thought about the child in the video; no right nor wrong answers, it was their opinion that mattered. In the second part they would be playing some easy games, like trying to find differences between pairs of pictures. This second part, in fact, was a filler task, included in the study with the only purpose of diminishing the probabilities that participants would discuss the details of the focal study with their classmates. Being the last part of the study (i.e., recent in memory) and the one part where the correctness of the answers was more obvious, hopefully it would also be the more tempting for children, who wished to share the experience with friends. Sixth-graders and older participants were directly asked not to discuss the details of the studies with the classmates, and undergraduates were not asked to complete this second part.

Next, participants were informed that they were about to see a short film featuring a child speaking. A fictitious name was attributed to the target-child (different for every two participants, and never coincident with the child's or parents' names), in order to enhance the concreteness of the exercise and also to increase the probability that participants thought they were seeing different films, in case they commented on the procedure between sessions. Participants learned that the video had no sound and, as such, they would not be able to tell what the target-child was saying exactly, but that the target-child was talking about a time

³⁹ Birthdates of all the preschoolers and of a few 2nd-graders were obtained or checked with their teachers.

when his/her parents got mad at him/her [were pleased with him/her] and gave him/her a punishment [a gift]. If a participant asked why the video had no sound, it would be explained that that laptop computer had a malfunction that affected sound reproduction. Immediately before the video started, participants were told “So, here is _____[target-child’s name]. S/he’s talking about one time when s/he got a...” and participants would complete the sentence with the previously given topic. In the infrequent cases when participants did not complete the sentence spontaneously, they would be directly prompted by the experimenter to name the topic. This procedural step was included in order to make sure that all participants remembered the situational information, upon watching the video.

When the *sad child* video ended, the experimenter read each one of the questions and marked the respective answer given by the participant. The dependent measures are described in full detail in a following section and an exemplar of the coding sheets can be found in Appendix C. After the last question participants were invited to talk about a time when they received a gift that they really enjoyed in order to restore a more positive mood.

Then participants (except adults) completed the alleged second part of the study, consisting of four exercises.⁴⁰ The exercises were easy enough to ensure success by a large majority of the participants. Preschoolers and second-graders completed the same set of exercises, except that second-graders’ performance was ostensibly timed. Sixth- and ninth-graders completed a slightly more difficult set of tasks, and ninth-graders were also ostensibly timed. Finally, participants were thanked for their participation and dismissed.

Design

Participants within each grade-level and gender were distributed randomly across two levels of the situational constraints variable. The resulting design can be formalized as follows: 5 *grade-levels* (preschool vs. 2nd-grade vs. 6th-grade vs. 9th-grade vs. undergraduate) × 2 *conditions* (gift vs. punishment) × 2 *versions* (female vs. male).

Dependent Measures

The dependent measures were also directly adapted from Gilbert, Pelham, and Krull’s study (1988 – Study1). As such, three items composed the *dispositional ratings* measure (i.e., referred to as the *perceived trait* in the original), and the other three items composed the *behavioural predictions* measure (i.e., *predicted state* in the original). The first of these

⁴⁰ See the final pages of Appendix C for exemplars of the filler tasks.

measures can be considered the focal measure, while the second one was included in the original study mainly to heighten confidence in the results of the focal measure. However, as conjectured in the theoretical framework section [SEE SECTION 2.2.7.C], although behavioural predictions seem to be a valid measure of dispositional inference in adults, there are solid reasons to be sceptical of the validity of measuring dispositional inference in childhood via behavioural predictions, as often occurs in developmental research. Hence, the *behavioural predictions* measure was included in the present study mainly to explore eventual matches and mismatches with the *dispositional ratings* measure. Finally, the measure used in the original study to verify that participants in both conditions had cognitive access to the situational constraints information (i.e., *recall of discussion topics*) had to be modified for the current purposes. In the present study, the procedure ensured that participants would recall the topic, but it was still important to verify whether participants of all grade-levels understood how the situational information would constrain the target-child's behaviour. Therefore, the *understanding of situational constraints* measure was created. All dependent measures were obtained in 5-point pictorial scales.⁴¹ The scales were piloted to ensure that preschoolers understood (a) the meaning of each point label, and (b) the ordinal sequence underlying the scale. More details on this pilot study are presented in Appendix D.

Dispositional ratings. Participants were asked to rate “How do you think Ann [target-child] is usually like, in her day-to-day life, when she is at home or at school?” on three 5-point pictorial scales (see below). Since the Portuguese word for the trait meaning of “to be” (i.e., *ser*) is different from the word with the state meaning (i.e., *estar*), these instructions were believed to be clearly directed at a dispositional rating. Moreover, in the pre-test of the videos these same instructions produced quite different ratings from the instructions requiring behavioural (or state) ratings. (1) The first scale was anchored by the labels *very sad* – *very happy*, and the pictorial labels varied from a frowning face with two tears to an open-wide smiley face. (2) The second scale was anchored by the labels *is always crying* – *never cries*, and the pictorial labels ranged from a frowning face with six tears to a neutral face. (3) Finally, the third scale was anchored by the labels *never laughs* – *is always laughing*, and the pictorial labels varied from a neutral face to a wide-open smiley face. Scales were introduced by the experimenter saying “Do you think Ann [target-child] is more like *happy* [one pole label], more like *sad* [other pole label], or something in between?”, while pointing at the corresponding directions.

⁴¹ Recall that an exemplar of the coding sheets is available in Appendix C.

The internal consistency of a composite of these three scales, given by Cronbach's alpha, varied substantially across grade-levels and version/gender [SEE APPENDIX E1]. In all cases, though, internal consistency was heightened with the exclusion of the second rating scale. This may be a reflection of the social norm "boys don't cry", since the second scale worked particularly poorly in the male version. With the exclusion of this scale, the value of the overall Cronbach's alpha raises to $\alpha = .72$, which is a good indicator considering the extremely low number of items and that Cronbach's alpha can be considered a lower-bound estimate of the reliability of the measure (Maroco & Garcia-Marques, 2006). The dispositional ratings measure consisted, then, in an index made out of the average of the ratings produced with the first and third scales.

Behavioural predictions. Participants were asked to rate "How would Ann [target-child] feel if...", in three other 5-point pictorial scales, for three hypothetical sadness-inducing scenarios: (1) "she lost a toy that she loved"; (2) "she could not go to a friend's birthday party"; (3) "her parents picked her up at school very late, after all other kids were already gone". The pictorial rating scales were anchored by the phrases *super sad – not sad at all* and the pictorial labels ranged from a frowning face with six tears to a neutral face.

The internal consistency of a composite of these three scales, estimated by Cronbach's alpha, varied again substantially across grade-levels [SEE APPENDIX E2]. In some cases, internal consistency would be heightened with the exclusion of one of the scales and in some other cases would not. Moreover, the preferably excluded scale was not the same in each case. Therefore, none of the scales was excluded and the behavioural predictions measure was computed as the average of the ratings on the three scales. However, it must be noted that the internal consistency of the measure is not high, overall Cronbach's $\alpha = .65$, possibly indicating that the hypothetical scenarios had different meanings across grade-levels. Thus, results derived from this measure should be interpreted with caution.

Understanding of situational constraints. Finally participants were told that the questions regarding the target-child were finished, and that the next questions were about themselves (except for adults, who were told that the next questions were about children in general). The last two questions were phrased as follows "How would you feel like if you were talking about a time when your parents got mad at you and punished you?" and "How would you feel like if you were talking about a time when your parents were pleased with you

and offered you a gift?”.⁴² The 5-point pictorial scales were anchored by the phrases *very sad* (frowning face with two tears) and *very happy* (wide-open smiley face).

2.3.1.B) RESULTS

In order to analyse the relevant data for validating the paradigm and for the hypothesis testing, a 5 (grade-level) \times 2 (condition) \times 2 (version) ANOVA was conducted on the dispositional ratings, and planned contrasts between conditions per grade-level were computed under this ANOVA model. Since homogeneity of variances could not be assured, Levene’s $F(19, 132) = 2.36, p = .002,$ ⁴³ the dependent variable was ranked and the ANOVA was performed on these ranked values. Roughly, this procedure transforms the data into ordinal data and functions like a nonparametric alternative to the factorial ANOVA test (Conover & Iman, 1981). The test statistics concerning the planned contrasts that are described in Table 2 were obtained using the rank-transformed data.⁴⁴

The descriptive statistics in Table 2 and the graphical illustration of the dispositional ratings in Figure 1, on the other hand, are presented using the raw data. Please recall that the dispositional ratings measure was obtained by averaging the ratings on two pictorial scales, that values may range between 1 and 5, and that lower values denote a perceived trait aligned with the behaviour (i.e., sad), while higher values indicate greater perceived happiness.

⁴² For the adults, the questions read “How would an average/typical child feel if...”.

⁴³ The heterogeneity of variances seems to be more linked to differences of variability in the ratings per grade-level than per condition; see Appendix E1 for the Levene’s tests per effect.

⁴⁴ An ANOVA performed on the raw data produces the same significant effects; see Appendix E1 for ANOVA tables and contrasts with raw data.

Group	Condition	Descriptive			Contrasts		
		<i>M</i>	95% CI	<i>SD</i>	<i>t</i> (132)	one-tailed <i>p</i>	η_p^2
preschoolers							
	<i>gift</i>	3.93	[3.36; 4.51]	1.03			
	<i>punishment</i>	3.50	[2.86; 4.14]	1.15	1.42	.079	.015
2 nd -graders							
	<i>gift</i>	3.07	[2.41; 3.73]	1.19			
	<i>punishment</i>	3.67	[3.12; 4.22]	0.99	1.79	.038	.024
6 th -graders							
	<i>gift</i>	2.37	[2.06; 2.67]	0.55			
	<i>punishment</i>	2.93	[2.46; 3.41]	0.86	1.81	.036	.024
9 th -graders							
	<i>gift</i>	2.47	[2.07; 2.86]	0.74			
	<i>punishment</i>	3.22	[2.82; 3.62]	0.75	1.88	.031	.026
undergraduates							
	<i>gift</i>	2.27	[1.94; 2.60]	0.59			
	<i>punishment</i>	3.17	[2.70; 3.63]	0.84	2.95	.002	.062

Table 2: Descriptive statistics of the dispositional ratings (means, 95% confidence intervals, and standard deviations) and test statistics with respective p-values and effect sizes for the contrasts between conditions of Study 1

Note. All n=15, except for 9th-grade in both conditions (n=16).

Paradigm validation

Undergraduates were expected to consider the target-child's behaviour (i.e., sad expression) as more revealing of his or her dispositional characteristics (i.e., sadness trait) in the *gift* than in the *punishment* condition, since in the latter condition the sadness-inducing discussion topic (i.e., situation) could account for the behaviour. The planned contrast performed under the above explained ANOVA model confirms the statistical significance of the expected difference, $t(132) = 2.95$, $p = .002$ (one-tailed), $\eta_p^2 = .062$.

The difference between ratings in the two experimental conditions replicates the results of the original study for participants in the no-cognitive-load condition (Gilbert, Pelham et al., 1988 – Study 1) and, hence, validates the use of this paradigm adaptation in the present study.

Dispositional ratings

The hypothesis guiding this study stated that younger children's dispositional ratings should not differ according to situational information (i.e., topic of conversation), while older children's ratings should reflect the consideration of this information. The above detailed 5 ×

2 × 2 ANOVA on the rank-transformed index of dispositional ratings was used to test this hypothesis.

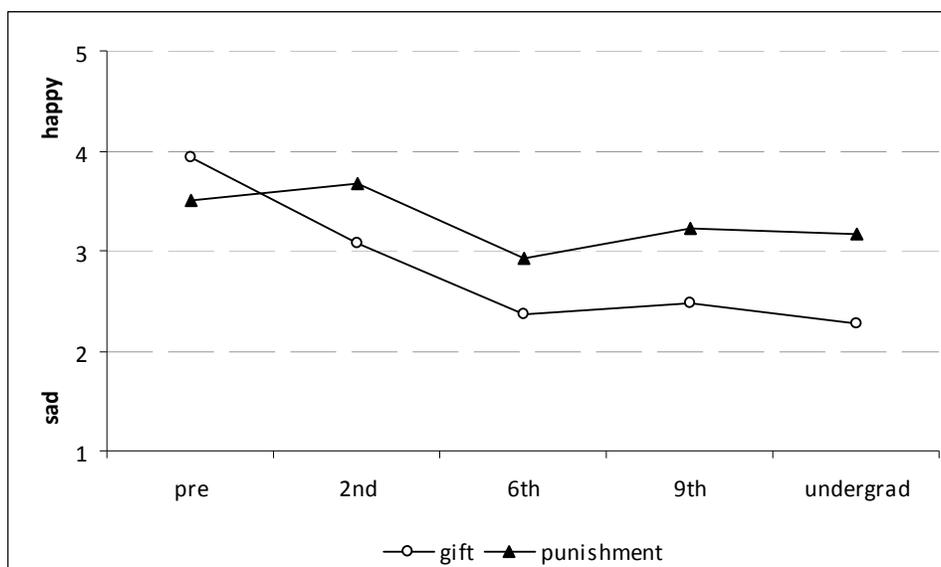


Figure 1: Mean dispositional ratings of each grade-level in the two experimental conditions of Study 1

The ANOVA revealed a main effect of grade-level, $F(4, 132) = 7.51, p < .001, \eta_p^2 = .185$, in which the two younger groups (i.e., preschool and 2nd-grade) rated the target-child as being significantly happier than the other three older groups, $t(132) = 5.32, p < .001, \eta_p^2 = .177$.⁴⁵ There was also a main effect of condition, $F(1, 132) = 9.81, p = .002, \eta_p^2 = .069$, with dispositional ratings in the gift condition being lower, in average, than in the punishment condition. These main effects, of grade-level and condition, were qualified by an interaction between the two factors, $F(4, 132) = 2.72, p = .032, \eta_p^2 = .076$, which was further explored with the planned contrasts that allow for the hypothesis testing. The version factor yielded no significant differences, $F(1, 132) = 1.50, p = .223, \eta_p^2 = .011$, nor significant interactions, and thus will not be referred any further.⁴⁶

As expected, preschoolers' ratings did not differ between conditions, $t(132) = 1.42, p = .079$ (one-tailed), $\eta_p^2 = .015$. The one-tailed p -value is reported here because it was predicted that young children would not rate the target-child speaking about a punishment as being happier than the target-child speaking about a gift (i.e., they would not perform situational correction). Thus, a one-sided test was more adequate to test the hypothesis. Moreover, it should be noted that the numerical difference obtained between conditions was

⁴⁵ Contrast of the two lower against the three higher grade-levels (coefficients: -3, -3, 2, 2, 2).

⁴⁶ See Appendix E1 for the full ANOVA table.

in the opposite direction of what could be interpreted as situational correction, and that the two-tailed test, with $p = .158$, leads naturally to the same conclusions (i.e., that preschoolers did not apply situational correction).

In the other grade-levels, as predicted, the dispositional ratings differed according to condition. The t -values, and associated one-tailed p -values, for the performed planned contrasts using the rank-transformed variable are inscribed in Table 2. In all these groups the same sad appearing target-child was perceived as being dispositionally sadder when believed to be talking about a gift rather than about a punishment.

Under the framework of the three-stage model of person perception, if participants are able to perform situational correction, they will discount their dispositional inferences when the behaviour could have been situationally determined. As such, it was expected that older participants' ratings in the punishment condition would be close to the midpoint of the scale. While the ANOVA model used for the analyses above does not allow for calculating contrasts against the midpoint of the scale, because the data were rank-transformed, the analogous $5 \times 2 \times 2$ ANOVA model computed on the raw data allows for such a contrast analysis.⁴⁷ As mentioned previously, the variance homogeneity assumption is violated in this ANOVA model, but because this violation did not lead to different results from the ones obtained with the rank-transformed data [SEE FOOTNOTE 44] and because the midpoint of the scale has a readily interpretable meaning (i.e., someone who is neither sad nor happy), the planned contrasts against the midpoint of the scale were still calculated. As expected, the contrasts revealed that sixth- and ninth-graders', as well as undergraduates', dispositional ratings in the punishment condition did not differ from the midpoint of the scale, all $t(132) < 1$. For the two lower grade-levels those ratings differed from the midpoint of the scale (preschool: $t(132) = 2.05$, $p = .042$, $\eta_p^2 = .031$; 2nd-grade: $t(132) = 2.84$, $p = .005$, $\eta_p^2 = .058$), but surprisingly not because they were correspondent with the behaviour (i.e., lower than the midpoint of the scale), but because they lied above the midpoint of the scale. This specific result, namely that younger children considered the target-child to be dispositionally happy in spite of his/her sad behaviour, does not impact directly the hypothesis under test, but seems to be inconsistent with the assumptions of the model.

⁴⁷ This analysis is done by calculating the ANOVA on the centred variable and then by attributing the coefficient 1 to the factor-level under analysis in the contrast and the coefficient 0 to all other levels; see Appendix E1 for the contrasts against the midpoint of the scale.

Behavioural predictions

As mentioned before, a behavioural prediction measure was included in this study because it has been considered a solid measure of dispositional inference (and dispositional attribution) both in social psychological (e.g., Gilbert & Malone, 1995; Ross, 1977) and developmental (e.g., Newman, 1991; Rholes & Ruble, 1984) literatures. Moreover, the original study by Gilbert, Pelham, and Krull (1988 – Study 1) included such a measure. However the results of the present behavioural prediction measure should be interpreted with caution, since, on the one hand, it revealed low levels of internal consistency, and on the other hand, as conjectured in the theoretical framework section [SEE SECTION 2.2.7.C], behavioural prediction measures with younger children may be plausibly affected by egocentric biases, producing results analogous to what could be called a *situationism* bias.

Keeping these cautionary notes in mind, the hypothesis stated, just like for the dispositional ratings measure, that younger children's behavioural predictions should not differ according to condition, while older children should predict that the sad target-child who had been seen talking about a gift would feel sadder in the sadness-inducing situations than the target-child who had been seen talking about a punishment.

Another $5 \times 2 \times 2$ ANOVA was performed on the behavioural predictions index in order to compute the relevant contrasts. The raw data could be used in this analysis, since the assumptions of normality and homogeneity of variances, Levene's $F < 1$, were plausibly satisfied.⁴⁸ Table 3 contains descriptive statistics of this measure and test statistics of the relevant planned contrasts, per grade-level and condition.

⁴⁸ See Appendix E2 for the ANOVA assumptions related material on this measure.

Group	Condition	Descriptive			Contrasts		
		<i>M</i>	95% CI	<i>SD</i>	<i>t</i> (132)	one-tailed <i>p</i>	η_p^2
preschoolers	<i>gift</i>	2.31	[1.86; 2.76]	0.81	< 1		.007
	<i>punishment</i>	1.96	[1.43; 2.48]	0.95			
2 nd -graders	<i>gift</i>	2.51	[1.96; 3.06]	0.99	< 1		.002
	<i>punishment</i>	2.36	[1.82; 2.89]	0.97			
6 th -graders	<i>gift</i>	2.82	[2.29; 3.36]	0.97	1.77	.040	.023
	<i>punishment</i>	3.29	[2.84; 3.74]	0.82			
9 th -graders	<i>gift</i>	3.00	[2.56; 3.44]	0.83	< 1		.001
	<i>punishment</i>	3.02	[2.57; 3.47]	0.85			
undergraduates	<i>gift</i>	2.44	[1.87; 3.02]	1.04	2.10	.019	.032
	<i>punishment</i>	3.38	[2.87; 3.89]	0.92			

Table 3: Descriptive statistics of the behavioural predictions (means, 95% confidence intervals, and standard deviations) and test statistics with respective p-values and effect sizes for the contrasts between conditions of Study 1

Note. All $n=15$, except for 9th-grade in both conditions ($n=16$).

A main effect of grade-level was obtained, $F(4, 132) = 6.12$, $p < .001$, $\eta_p^2 = .156$, this time with the two groups of younger children (preschool and 2nd-grade) predicting more sadness than the older groups (6th-, 9th-graders, and undergraduates), $t(132) = 4.78$, $p < .001$, $\eta_p^2 = .148$.⁴⁹ The version factor also produced a significant main effect, $F(1, 132) = 11.82$, $p = .001$, $\eta_p^2 = .082$, denoting that more sadness is predicted for the target-girl compared with the target-boy. Since version and gender are confounded in the present design, this main effect could also indicate that female participants predict higher levels of sadness than the male participants.⁵⁰

Concerning the planned contrasts between conditions for each grade-level, the expected difference is obtained with the undergraduates, $t(132) = 2.10$, $p = .019$ (one-tailed), $\eta_p^2 = .032$. This finding replicates again the results of the original study (Gilbert, Pelham et al., 1988 – Study 1) and strengthens the confidence on the validity of the paradigm adaptation. Also as expected, younger children, here preschoolers and second-graders, predicted that the target-child in the gift and in the punishment condition would feel the same amount of sadness in sadness-inducing situations, both $t(132) < 1$, while older children's predictions

⁴⁹ Contrast of the two lower against the three higher grade-levels (coefficients: -3, -3, 2, 2, 2).

⁵⁰ See Appendix E2 for the full ANOVA table

(i.e., 6th-graders) discriminated between conditions in the expected direction, $t(132) = 1.77$, $p = .040$ (one-tailed), $\eta_p^2 = .023$. Contrarily to what was expected, though, the ninth-graders' predictions did not differ according to condition, $t(132) < 1$. Some speculative notes about why these inconsistent results were obtained will be advanced in the discussion section.

Understanding of situational constraints

In the present paradigm, it is very important to check whether the chosen discussion topics were viewed by the participants as real situational constraints, namely whether they were considered as capable of inducing by themselves the emotions they were supposed to induce. Moreover, in the cases where situational information had no visible impact in the dispositional ratings (here in the preschoolers' group) it is also important to discard the possibility that this information was not used because it was not understood. The descriptive statistics regarding the participants' predictions of how they themselves would feel if they were asked to discuss each one of the discussion topics are presented in Table 4 and Figure 2.

Grade	Punishment			Gift		
	<i>M</i>	95% CI	<i>SD</i>	<i>M</i>	95% CI	<i>SD</i>
preschool	1.87	[1.36; 2.37]	1.36	4.93	[4.84; 5.03]	0.25
second	1.90	[1.60; 2.20]	0.80	4.97	[4.90; 5.03]	0.18
sixth	2.27	[2.03; 2.51]	0.64	4.83	[4.66; 5.01]	0.46
ninth	2.22	[2.00; 2.44]	0.61	4.72	[4.53; 4.91]	0.52
undergraduate	1.97	[1.74; 2.20]	0.61	4.63	[4.32; 4.95]	0.85

Table 4: Descriptive statistics of the understanding of situational constraints measure (means, 95% confidence intervals, and standard deviations) according to discussion topic
 Note. All $n=30$, except for 9th-grade ($n=32$).

From the observation of the means and 95% confidence intervals (95% CIs) it becomes clear that the gift topic was considered to be happiness-inducing and the punishment topic was considered as sadness-inducing by participants of all grade-levels. The inspection of the distributions of the ratings on this measure for the gift topic reveal that there is too little variance, especially in the group of the second-graders, to perform an ANOVA.⁵¹ However, the examination of the distributions suffices to verify that the modal value was always the same across grade-levels for the gift topic (mode = 5) and mostly the same for the punishment topic (mode = 2), with the exception of second-graders in the gift condition and preschoolers,

⁵¹ See Appendix E3 for histograms of the distributions.

for whom the modal response value was lower (mode = 1). This observation grants the idea, supported by the pattern in Figure 2 as well, that if there are age-related differences in this measure, the differences are not substantial in meaning, and younger children, if anything, assign more extreme constraining power to the discussion topics than older participants.

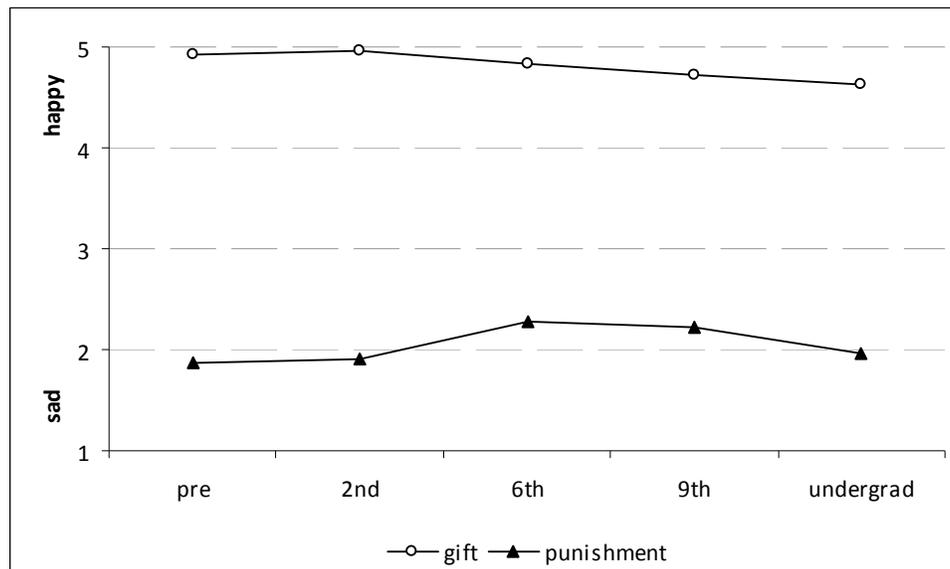


Figure 2: Mean ratings of the constraints imposed by the two discussion topics by each grade-level

2.3.1.C) DISCUSSION

Globally, the results obtained in this study conform to the ontogenetic prediction derived from the three-stage model of person perception, which states that the situational correction process should have an ontogenetically later onset than the dispositional characterization process. Participants of all grade-levels, except preschoolers, rated the sad appearing target-child as being dispositionally sadder when the situation could not account for the sad behaviour (i.e., in the gift condition) than when the situation could have induced the sadness (i.e., punishment condition). Moreover, the preschoolers' flawed adjustment of the dispositional ratings according to condition could not be due to a faulty understanding of the situational influence on the actor's feelings, since these children rated the impact of the conversation topics to have the same (or higher) extent as all other grade-levels did. These results, in turn, speak for the validity of the three-stage model, not only as an end-state model of human cognition, but also as a model with developmental applicability.

However, the present study produced some unexpected results as well. The most striking one lies in the fact that preschoolers rated the sad appearing target-child as dispositionally happy rather than sad in both conditions, and second-graders did the same in one of the conditions. Considering the three-stage model assumption that dispositional characterization flows efficiently and *correspondently* from behavioural categorization, this result is particularly intriguing. A number of factors could be at the origin of this result, some of them more methodological in nature and some others of more substantive relevance.

It is conceivable that there are differences in how younger and older children (or adolescents and adults) approach rating scales. For example, older participants may interpret the midpoint of a scale more abstractly as corresponding to the mean value of the population in the dimension under analysis, while younger participants may be more dependent on the concrete pictorial label attached to it. Should this be the case, then the above mentioned result would have been produced by a mere measurement artefact. However, this possibility does not seem to be very plausible, since in other measures, using the exact same pictorial scales (e.g., in the pre-test of the videos or in the understanding of the situational constraints), the rating behaviour of younger children was very similar to the other grade-level participants' behaviour.

Another possibility is that the *happy* ratings of the younger children reflect a positivity bias, which has been previously observed in children's dispositional ratings and assignment of traits and abilities to others (e.g., Newman, 1991; Mrug & Hoza, 2007; Rholes & Ruble, 1984, 1986). Being part of a response bias, the present result may again be based on a measurement artefact (e.g., the scale is not sensitive enough for young children because they are using only the upper half, while older participants are using the full scale), but it may also be pointing at something of more theoretical interest regarding how children draw dispositional inferences. This point will be resumed in the discussion of the eventual role played by prior expectancies and egocentric mechanisms in child person perception.

In a related vein, it can be considered that the choice of sadness as the focal trait was not particularly adequate. On the one hand, it is a strong valenced trait, and young children may have difficulty dealing with negative attributes. On the other hand, it may be the case that young children consider sadness to be primarily an emotional state rather than a trait. One way to bypass this latter problem would be to conduct another study either with a non-emotional trait (e.g., generosity) or with another instance of dispositional factors (e.g., attitudes), and preferably avoiding negative stimuli. This second alternative was pursued in Study 2.

The next possible explanations, for the *happy* ratings by preschoolers, to be discussed are guided by the three-stage model framework, and as such have potentially more substantive implications. One possibility is that all three stages have different and sequentially-organised ontogenetic onsets, and that young children still have difficulties with the first stage, namely with *behavioural categorization*. The possibility that preschoolers' dispositional ratings do not denote sadness because the behaviour was not categorized as sad, though, can be discarded considering the pre-test ratings of the video and previous developmental findings on emotional decoding (e.g., Widen & Russell, 2008).

Another possibility is that preschoolers had no difficulty with behavioural categorization in this study, but that they were still inept at *dispositional characterization*. Difficulties in dispositional characterization would be particularly expectable from young children who have still not acquired a full-fledged theory of mind and, thus, who would have difficulty considering that others may have psychological characteristics that are distinct from their own. Although this possibility cannot be discarded, it must be noted that a lot of preschoolers are expected to have already attained a theory of mind, as measured by a false-belief task (Wellman et al., 2001), and that this possibility would not account for the persistence of the *happy* ratings in the second-graders group. Moreover, previous research in the developmental literature [SEE SECTION 2.2.7.D] shows that even 4-year-olds can assign trait labels to actors based on his/her behaviour above chance level (e.g., Liu et al., 2007), and that children younger than that seem to be able and willing to assign stable dispositional characteristics (e.g., good and mean) to cartoon characters, for example (Garcia-Marques & Garcia-Marques, 2005).

An alternative possibility, still within the *dispositional characterization* process, is that there are other components, besides behaviour, on which people can base their dispositional inferences. Good candidates for these other components would be, for example, prior expectancies and egocentric (or projective) mechanisms. Applying this idea to the present result, it could be the case that younger children have a prior expectancy that all children are dispositionally happy, while older participants may have a more normally-distributed expectancy. If participants' dispositional inferences are shaped not only by behaviour but also by prior expectancies, then it would follow that younger children's ratings would be *happier*. The same reasoning can be applied to egocentric mechanisms. If the status of the self is important for the way others are predicted to be (i.e., dispositional characterization) and if younger children tend to be happier than older children, then younger children's dispositional ratings would again be *happier*. It can also be the case that it is not so much the content of the

expectancy or of the status of the self that is age-dependent, but the reliance of the social perceiver on these other components. In this case, the three-stage model, for example, could be a very adequate model of adult person perception, if adults rely mostly in the perceived behaviour, as they seem to rely (e.g., Jones & Harris, 1967). However, the theory could need some additions in order to model child person perception, if it was to be established that young children rely indeed more heavily than adults in prior expectancies or in how they themselves are like, for example.

The results obtained with the behavioural prediction measure, though fitting the hypothesised results in the strict sense (i.e., concerning just younger and older children), have only a partial fit with the dispositional ratings results and with the expected age-related consolidation of the corrective operation. The hypothesised pattern was obtained with younger children (i.e., preschoolers), whose predictions did not differ according to condition, and with older children (i.e., 6th-graders) and adults (i.e., undergraduates), who predicted that the target-child who had been sad talking about a gift would be sadder in the sadness-inducing situations, than the target-child who had been talking about a punishment. The second-graders' ratings in this measure do not show any signs of situational adjustment (conversely to the dispositional ratings measure), which could simply denote that the behavioural prediction task is more cognitively demanding than the dispositional rating task. A much more puzzling inconsistency was found in the ninth-graders' behavioural predictions, which do not match neither the sixth-graders' nor the undergraduates' predictions, being inconsistent with the presupposed application of situational correction.

As mentioned before, the reliability of the present behavioural prediction measure does not grant solid conclusions, since one can seriously doubt whether the three scenarios had the same meaning for all grade-levels. Nonetheless, it may still be interesting to speculate about what may be producing the differences between the dispositional ratings measure and the behavioural predictions measure.

In the theoretical framework section of this part of the research [SEE SECTION 2.2.7.C], the conjecture that children base their behavioural predictions of others on how they themselves would behave in the situation was put forward. In adult literature, the simulation theory (Gordon, 1986, 1992), for example, proposes that adults still use this *egocentric* mechanism, and it seems reasonable to consider the possibility that people rely heavily on how they themselves would react to certain situations to estimate how others would react. Applying this idea to the present results, it is conceivable that younger children may be predicting the same levels of sadness across conditions, not because they did not produce a dispositional inference

about the target-child (as it is usually interpreted in the developmental literature), not even because the dispositional inference was identical across conditions (as both the three-stage model and the obtained dispositional ratings seem to suggest), but because they are not using dispositional inferences at all to mediate their behavioural predictions. It is possible that children are relying almost exclusively in their own predicted reactions, which would not vary across the present experimental conditions. Consistent with this view, the situations were created to be easily understandable by, and sadness-inducing for, younger children, and the two lower grade-levels are indeed the ones who predict higher levels of sadness. Older children (i.e., 6th-graders), in turn, could already be able to adjust the egocentric prediction using the previously drawn dispositional inference about the actor. The explanation for the adolescents' performance, within the present framework, is necessarily highly speculative and constructed *a posteriori*. It may be the case that the hypothetical scenarios of the behavioural prediction measure are still applicable to adolescents (e.g., parents still often pick them up at school), thus allowing for the egocentric prediction, but are a bit void in terms of sadness-inducement (e.g., an adolescent could probably worry if his/her parents one day picked him/her late at school, but would not probably feel sad), which could have interfered with the prediction process. Finally, once the hypothetical scenarios are no longer applicable to undergraduates (and they are plausibly more skilled at coordinating person perception information), it would be expectable that they would rely less on egocentric predictions and more on the extracted characteristics (i.e., on dispositional inferences) of the target-child.

Independently from the validity of the above discussed possibilities for the behavioural prediction process, the mismatch between dispositional ratings and behavioural predictions in this study strengthens the doubt that these measures tap at the exact same process (i.e., dispositional inference). Moreover, they caution us against concluding that young children's failure to produce differential behavioural predictions across conditions (e.g., Rholes & Ruble, 1984) necessarily prove that they did not make differential dispositional inferences about the actor.

From the previous discussion paragraphs two aspects are hopefully quite apparent, namely (1) that the present study, in the data it allowed to collect, offers a lot of interesting possibilities to explore further, and (2) what the major methodological flaws were (e.g., the use of highly valenced stimuli, not having assessed prior expectancies and self-ratings). Concerning the first aspect, once the main goal of this part of the research project is to test a social cognitive model and since this was not yet fully accomplished, further explorations were postponed and a more decisive test of the model was pursued in Study 2. Regarding the

second aspect, the problems identified in the paradigm of the present study helped to shape the new test of the model. Hence, negatively-valenced material was avoided, due to young children's apparent discomfort with this type of material and positivity bias. Prior expectancies were also avoided, since the content or the reliance on this type of information may be age-dependent. The same reasoning led to an avoidance of material on which participants could easily project personal feelings or preferences. Finally, dispositional rating measures were preferred over behavioural prediction measures because the equivalence of the two types of measures in assessing *dispositional characterization* is doubtful.

2.3.2. STUDY 2A – WEEKEND WITH A FRIEND

The hypothesis to be tested in Study 2 is identical to that in Study 1. The difference between these two studies resides in the paradigm. The classical *attitude attribution* paradigm (Jones & Harris, 1967) offered itself as an interesting possibility for many reasons. First of all, it is a very well researched paradigm, offering quite reliable findings for the study of dispositional inference in the presence of situational constraint information. The paradigm also allows for the study of verbal behaviour, which is a good complementary alternative to the non-verbal behaviour under focus in the previous study. In the same vein, the attitude attribution paradigm, as its name indicates, targets attitudes as dispositional factors, and not traits as in the previous study. Moreover, and plausibly because of the above mentioned features, this paradigm was also used by the three-stage model authors (Gilbert, Pelham et al., 1988; Gilbert, Krull et al., 1988), in combination with the *silent interview* paradigm, to test that model.

As indicated in the discussion of the previous study, some features of the present adaptation of the paradigm were included to address potential problems of Study 1. The adaptation of the paradigm aimed for simplification, so that it would be understandable by young children (e.g., the essay on a polemic social topic was substituted by a much simpler attitudinal statement), but more importantly it aimed to preclude prior expectancies (about the target-child's most probable attitude) and the applicability of participants' own attitudes. Additionally, neither the stimuli nor the dependent measures were negatively valenced (e.g., the stated attitude was positive and the attitudinal dimension had two *positive* poles, namely one favouring one option and the other favouring another option).

It must be acknowledged, though, that there is at least one previous work, by Costanzo, Grumet, and Brehm (1974), in which children's performances were tested using a direct adaptation of the attitude attribution paradigm. This work is especially relevant to the present research project because one of Costanzo and collaborators' hypotheses was identical to the present hypothesis, though formulated under a different theoretical framework (i.e., Piagetian view of the development of moral judgement). The authors conjectured that younger children (i.e., 1st-graders) would attribute attitudes primarily based on behavioural outcome (i.e., playing with a certain toy) and that older children (i.e., 3rd- and 6th-graders) would increasingly take into account whether the behaviour was performed freely (i.e., the preferred toy was accessible) or under situational constraints (i.e., the preferred toy was inaccessible). Contrary to the authors' expectations, and to the present hypothesis as well, even the youngest children in the study attributed attitudes differentially according to whether the played-with toy had been chosen or not. However, in Costanzo and collaborators' paradigm there was a clearly defined prior expectancy about which was the target-child's preferred toy, since the target-child was seen reaching for one of the toys and getting it in one condition (i.e., choice condition) or not managing to get it in another condition (i.e., no-choice condition).⁵² If it is the case that young children rely heavily on prior expectancies to draw dispositional inferences, then the same results, as the ones that were obtained, would be expected (i.e., attributing a positive attitude to the played-with toy in the choice condition and to the unplayed-with toy in the no-choice condition). These results strongly support the idea that precluding prior expectancies, as was done in the next study, is essential for a more definitive test of whether young children take situational constraints into account while dispositionally characterizing an actor.

OVERVIEW

Participants watched a short animation video telling the story of a target-child who stated joy over spending a weekend with the host friend [*behavioural information*]. During the narration of the story participants learned that the target-child had been either free to choose [*choice condition*] or constrained to choose [*no-choice condition*] that particular friend to spend the weekend with [*situational constraints*]. After watching the story, participants

⁵² The prior expectancy was particularly obvious in the no-choice condition where the target-child was seen making six attempts at getting the preferred toy, a gesture of frustration when she failed, and a "wistful look back" (Costanzo et al., 1974, p. 356) towards the preferred toy.

were asked to make *dispositional judgements* about the target, indicating the true attitude of the target-child towards the host friend, and to explain the target-child's behaviour.

It was expected that older children, adolescents, and adults would attribute a more positive attitude of the target-child towards the host friend when the target-child had had freedom of choice. Once again, younger children's ratings were expected to correspond to the stated behaviour, irrespectively of the situational constraints.

2.3.2.A) METHOD

Participants

Participants in this study were 30 preschoolers, 30 second-graders, 31 sixth-graders, 30 ninth-graders, and 30 undergraduates. Major demographic characteristics (age and gender) of each grade-level are summarized in Table 5.

Child and adolescent participants came from the same background, and were recruited with the same procedures, as in Study 1. Adult participants were undergraduate students at ISCTE-IUL, Lisbon, and their participation granted them credit for a psychology course.

Grade	Age			Gender	
	<i>M</i>	<i>SD</i>	[<i>min</i> ; <i>max</i>]	males	females
preschool	5y 9m	3m	[5y 2m; 6y 2m]	16 (53%)	14 (47%)
second	7y 10m	4m	[7y 4m; 8y 9m]	16 (53%)	14 (47%)
sixth	11y 10m	5m	[10y 10m; 12y 6m]	13 (42%)	18 (58%)
ninth	14y 9m	4m	[14y 1m; 15y 3m]	16 (53%)	14 (47%)
undergraduate	20y	4y	[17y; 37y]	2 (7%)	28 (93%)

Table 5: Descriptive statistics concerning age (mean, standard deviation, minimum and maximum values) and gender (frequencies and percentages) of Study 2a participants
 Note. All n=30, except for 6th-grade (n=31). y = years, m = months.

Material

An animated and narrated story was created for this adaptation of the attitude attribution paradigm. In the story, a target-child had two friends. Because his or her parents were travelling the next weekend, the target-child was to spend the weekend with one of the friends. In the *choice condition*, there were no situational constraints to the target-child's behaviour, in that both friends were available for the weekend. Conversely, in the *no-choice*

condition, only one of the friends was available because the *other* friend was also travelling during the weekend. In both conditions the story ended with the target-child expressing a positive attitude towards the prospect of spending the weekend with the *host* friend.⁵³

The graphics were created using Microsoft Office ClipArt and the animation was set up using Microsoft Office PowerPoint 2003. The narration of the story was recorded by a female voice and edited so that only the names of the characters and the focal aspects of each condition would differ among the versions of the story. Four versions of the story were made, resulting from the crossing of gender (female and male versions) and experimental conditions (choice and no-choice versions). The stories were presented on an ASUS laptop, connected to a pair of speakers, running Microsoft Office PowerPoint 2003.

Procedure

The first part of the procedure, namely welcoming the participants, confirming the consent, and filling in the demographic data, was identical to the initial procedure of Study 1, except for the undergraduates. In this study undergraduates were scheduled for the individual sessions and were sent to the testing room by the lab manager. The testing room was a medium-sized room, part of the Social and Organisational Psychology Laboratory (LAPSO) of the ISCTE-IUL. All sessions were run by the same female experimenter.

Participants then learned that the study consisted of two different parts. In the first part they would watch a short story displayed on the laptop and then, because the first part was so quick and their help was valuable, there was a second part, unrelated to this project. This second part meant to diminish the probabilities that children would discuss the details of the focal study with other potential participants.

In the first part, participants were told that three children appeared in the story they were about to see, and that it was important to present them beforehand so that the participants could memorise their names. The three child-characters were then introduced orally, one at the time, while placing three cards with the pictures and names of the characters on the table.⁵⁴ Preschoolers' memory for the characters' names was probed immediately after this presentation and any mistakes or misses were corrected. The cards were left in sight during the rest of the procedure for all grade-levels.

Participants then watched the story, and at the end they were prompted by the experimenter to retell it using the uncompleted phrase "So, Agnes' [target-child's] parents are

⁵³ The animation storyboard and narration text can be found in Appendix F1.

⁵⁴ See Appendix F2 for exemplars of these cards and the exact wording used in the introduction of the characters.

travelling next weekend and therefore...”. This step of the procedure was included in order to check for comprehension and recall of the situational constraints in the no-choice condition. Participants were considered to be successful at this point if they correctly mentioned the direction of the behaviour (i.e., identified the *host* friend) and the situational constraints in the no-choice condition (i.e., referred that the *other* friend would be absent). When this was not the case, participants were asked directly “With whom will Agnes [target-child] stay?” or “What was going on with Jane [*other* friend]?”. A considerable percentage of preschoolers (40%) erred in the name of the host friend in the choice condition, while the correspondent percentages for the other grade-levels were lower (2nd-grade: 13%; 6th-grade: 13%; 9th-grade: 7%; undergraduates: 0%). Given that preschoolers were the only group that had to retain the three names in memory, since they could not read the names from the cards, this divergence is not surprising. Of more concern was the percentage of participants in the no-choice condition that could not answer the second control question. While older participants had no difficulty at all with the question (6th- and 9th-grade and undergraduates: 0% mistakes), a substantial number of younger participants (preschoolers: 40%; 2nd-graders: 33%) could not verbalise the unavailability of one of the friends after watching the story once. In order to enhance participants’ memory and understanding of the story, after a mistake the experimenter would always articulate the correct answer, stressing the important aspects and pointing to the relevant character’s card. Moreover, the animated story was always presented twice for preschoolers and second-graders (the control questions were asked between presentations). For older participants the story was presented a second time only if they were wrong or hesitated in one of the above mentioned aspects.⁵⁵

After the final presentation of the story, participants completed the dependent measures. In order to maintain consistency across all grade-levels, the questions were always read aloud by the experimenter, who also noted the participants’ answers verbatim.

Participants were then invited to move on to the next part of the study (an unrelated pilot study) and at the end were thanked and dismissed.

Design

Participants within each grade-level and gender were distributed randomly across two levels of the situational constraints variable (i.e., (im)possibility to choose between friends).

⁵⁵ Though the levels of understanding of the situational constraints by preschoolers and second-graders after the first presentation of the story may be discouraging, results obtained with the last dependent measure assure that the majority of these participants were able to subsequently verbalise the situational constraint information [SEE BEHAVIOUR EXPLANATIONS IN RESULTS SECTION].

Again, the study followed a three-way factorial design: 5 *grade-levels* (preschool vs. 2nd-grade vs. 6th-grade vs. 9th-grade vs. undergraduate) \times 2 *conditions* (choice vs. no-choice) \times 2 *versions* (female vs. male).

Dependent Measures

Dispositional ratings. The attitude attribution measure for the present study was adapted from the 13-point bipolar scale used by Gilbert, Pelham, and Krull (1988 – Study 2), rather than the original measure by Jones and Harris (1967), since a multi-item Likert-type scale did not suit this adaptation of the paradigm. The present measure was a 7-point pictorial scale, delivered in a two-step fashion.⁵⁶ First participants answered the question “Do you think that Agnes [the target-child], truly truly, wanted more to stay with Catherine [the host friend], or with Jane [the other friend], or with both equally?”. The upper part of the scale displayed the picture of each friend, for visual support, and a square in the middle. If participants gave the undifferentiated answer, the square would be marked, and the next dependent measure would follow. If participants chose one of the friends, the second part of the scale would be introduced with the question “And do you think she wanted just a little bit more, some more, or a lot more to stay with _____ [the previously chosen friend]?”. The lower part of the scale contained six circles of different sizes arranged so that the two larger circles (i.e., indicating a larger preference) were further away from the centre, followed by the medium-sized circles, and the smaller circles (i.e., indicating a small preference) were closer to the centre of the scale. The attention of the participants towards one of the halves of the scale was guided by the experimenter, who would point to each of the three circles, corresponding to the friend chosen in the first step of the scale, while asking the question. When participants chose the *host* friend, the rating would be coded with a positive sign, the smaller circle corresponding to value +1, the medium-sized circle to +2, and the larger circle to +3. The same coding was applied when the *other* friend was chosen, except that a negative sign would be attributed. The undifferentiated answer was coded with the value 0.

Behaviour explanations. After responding to the first dependent measure, participants were asked to explain the target-child’s behaviour “Why do you think Agnes [target-child] told Catherine’s mom [host friend] that she would enjoy spending the weekend over there, instead of telling that do Jane’s mom [other friend]?”. This measure was included mainly to

⁵⁶ See Appendix G for an exemplar of the coding sheets.

verify whether participants would invoke the situational constraints in the no-choice condition.

2.3.2.B) RESULTS

In this study, the undergraduate sample had the peculiarity of containing only two male participants (one assigned to each condition). Since the version factor of the design is matched with participant's gender, the undergraduates' ratings had insufficient variance on this factor to be analysed together with the other grade-levels. Therefore the undergraduates' data were analysed separately, and used mainly to check the validity of the paradigm adaptation. The dispositional ratings of the remaining groups were analysed together to test the hypothesis. Table 6 contains some descriptive and test statistics associated with the obtained data. Regarding the mean values, positive numbers indicate a perceived attitude aligned with the behaviour (i.e. preference for the *host friend*), negative numbers indicate a perceived attitude that counters behaviour (i.e., preference for the *other friend*), and values close to the midpoint of the scale (i.e., the zero) denote the absence of a perceived preference.

Group	Condition	Descriptive			Contrasts		
		<i>M</i>	95% CI	<i>SD</i>	<i>t</i> (105)	one-tailed <i>p</i>	η_p^2
preschoolers							
	<i>choice</i>	2.20	[1.33; 3.07]	1.57	< 1		.009
	<i>no-choice</i>	1.33	[0.10; 2.57]	2.23			
2 nd -graders							
	<i>choice</i>	1.73	[0.99; 2.47]	1.33	2.05	.022	.038
	<i>no-choice</i>	0.53	[-0.53; 1.60]	1.92			
6 th -graders							
	<i>choice</i>	1.13	[0.44; 1.82]	1.25	2.72	.004	.066
	<i>no-choice</i>	-0.13	[-0.51; 0.26]	0.72			
9 th -graders							
	<i>choice</i>	1.13	[0.55; 1.72]	1.06	2.85	.003	.072
	<i>no-choice</i>	-0.27	[-0.60; 0.06]	0.59			
undergraduates							
	<i>choice</i>	1.73	[1.12; 2.34]	1.10	<i>U</i> =21	< .001	<i>d</i> =2.25
	<i>no-choice</i>	-0.07	[-0.21; 0.08]	0.26			

Table 6: Descriptive statistics of the dispositional ratings (means, 95% confidence intervals, and standard deviations) and test statistics with respective *p*-values and effect sizes for the contrasts between conditions in Study 2a

Notes. All *n*=15, except for 6th-grade in no-choice condition (*n*=16). The *t*-test statistic refers to all grade-levels except to the undergraduate sample, for which a Mann-Whitney U test was performed. For the undergraduate sample the effect size was calculated using Cohen's *d* (instead of partial eta-squared).

Paradigm validation

It was expected that adults would consider the target-child's behaviour (i.e., expression of joy over spending the weekend with the host friend) as diagnostic of his/her attitude (i.e., preference for that friend) only in the choice condition, since in the no-choice condition the situational constraints could account for the behaviour. The 95% CI for the no-choice condition, which contains the midpoint of the scale, attests that, as expected, undergraduates did not infer a preference of the target-child in the no-choice condition. Conversely, they inferred a disposition correspondent to the behaviour in the choice condition, as evidenced by the exclusion of the midpoint of the scale from the 95% CI and confirmed by a non-parametric Mann-Whitney U test carried out between conditions on the undergraduates' dispositional ratings, $U = 21$, $p < .001$, $d = 2.25$.⁵⁷ These results support the validity of the adapted paradigm.

It may be argued, however, that the normatively correct results produced by the adults in this study do not replicate the usual findings of the attitude attribution paradigm, namely the correspondence bias itself and the larger variance in the no-choice condition, and, thus, do not validate the adapted paradigm. Yet, three features of this adaptation of the paradigm can plausibly explain the unbiased performance of the adults: (1) its simplicity, necessary for comprehension by children, meant less behavioural information to process and lesser demands on adults' cognitive resources; (2) the lack of prior expectancies concerning the most probable disposition may lead to a more data-driven processing; (3) the lack of a relevant personal attitude of the participants themselves may leave them with one less piece of information, which, as such, cannot influence the processing.⁵⁸ Thereby, confidence in the validity of the paradigm adaptation is sustained.

Dispositional ratings

The hypothesis under test was that younger children's attitude attribution would not differ according to the presence of situational constraints (i.e., level of behavioural choice), while older children's ratings should reflect consideration of these constraints. To test this hypothesis, a 4 (grade-level) \times 2 (condition) \times 2 (version) ANOVA was performed on the dispositional ratings of the remaining four grade-levels, and planned contrasts were computed

⁵⁷ The nonparametric test was performed because variances are higher in the choice than in the no-choice condition, Levene's $F(1, 28) = 21.22$, $p < .001$.

⁵⁸ Recall that in the original paradigm the essay subject is usually a controversial topic of the public domain.

under this ANOVA model. Once again the ANOVA was calculated on rank-transformed data,⁵⁹ since both assumptions of normality and homogeneity of variance, Levene's $F(15, 105) = 4.41, p < .001$, could not be clearly satisfied.⁶⁰ Figure 3 depicts the five grade-levels (including undergraduates) and the raw means, however, for illustrative purposes only.

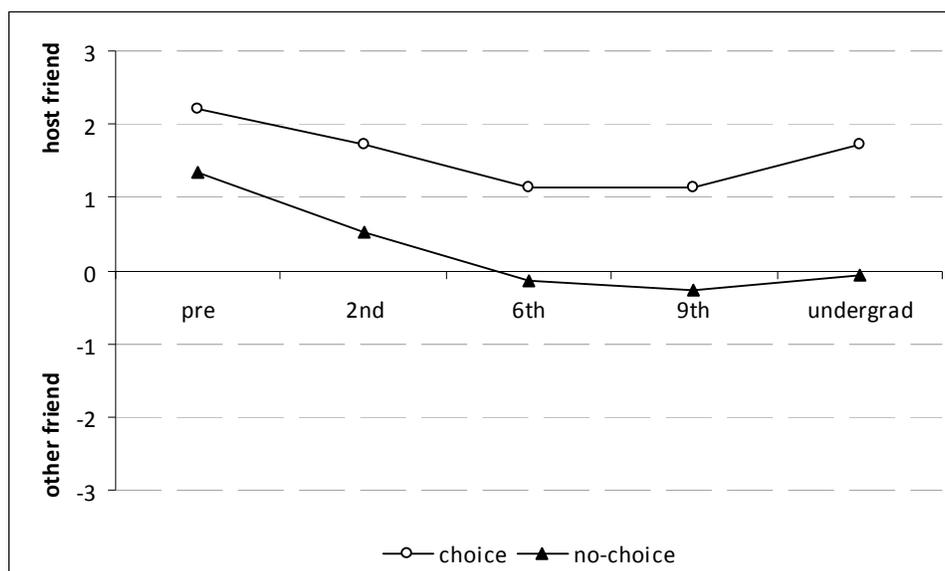


Figure 3: Mean dispositional ratings of each grade-level in the two experimental conditions of Study 2a

The ANOVA revealed a main effect of grade-level, $F(3, 105) = 9.09, p < .001, \eta_p^2 = .206$, which denotes a linear decrease in the extremity of the dispositional ratings with grade-level, $t(105) = 4.96, p < .001, \eta_p^2 = .190$.⁶¹ There was also a main effect of condition, $F(1, 105) = 18.46, p < .001, \eta_p^2 = .150$, with dispositional ratings in the choice condition being higher than in the no-choice condition. The version factor yielded no significant differences, $F < 1$, or interactions, and will, thus, not be referred any further.⁶²

As expected, preschoolers' ratings did not differ between conditions, $t < 1$. In fact, within the ANOVA model with the raw (rather than with the ranked) data, which allows for planned comparisons against the 0-value, the dispositional ratings in the no-choice condition are significantly different from the midpoint of the scale, $t(105) = 3.59, p = .001, \eta_p^2 = .109$.⁶³

⁵⁹ The ANOVA performed on the raw data produces the same significant results; see Appendix H1 for both ANOVA tables and for the contrasts calculated with the raw data.

⁶⁰ Again, the heterogeneity of variances seems to be more linked to differences of variability in the ratings per grade-level than per condition; see Appendix H1 for the Levene's tests per effect.

⁶¹ Contrast using linear polynomial coefficients (i.e., -3, -1, 1, 3).

⁶² Recall that a full ANOVA table can be found in Appendix H1.

⁶³ See Appendix H1 for the contrasts against the midpoint of the scale.

This means that preschoolers inferred that the target-child preferred indeed the friend with whom s/he would spend the weekend, even when the target-child had no opportunity to choose, and in this case they demonstrated the correspondence bias.

At all other grade-levels, and again as expected, the dispositional ratings differed according to condition. The t -values, associated one-tailed p -values, and partial eta-squared, for the performed planned contrasts using the rank-transformed data can be found in Table 6. Planned contrasts against the midpoint of the scale, verify that the dispositional ratings of these three grade-levels (i.e., 2nd-, 6th-, and 9th-grade) do not indicate a preference of the target-child in any direction (2nd-grade: $t(105) = 1.58$, $p = .117$, $\eta_p^2 = .023$; 6th- and 9th-grade: $t < 1$), which is consistent with the theorized use of situational information to correct correspondent inferences about an actor's disposition.

Behaviour explanations

The explanations for the target-child's behaviour offered by the participants were coded by two independent judges as referring to specific situational aspects, to a preference of the target-child, or as non-responses.⁶⁴ The first two categories were not treated as mutually exclusive (i.e., an answer could be coded in both categories, when multiple aspects were invoked), but as exhaustive alongside with the non-response category (i.e., each answer was coded in at least one category). The *situational* category included all references to situational details that did not presuppose a preference by the target-child, for example references to the unavailability of the other friend in the no-choice condition (e.g., "because Jane was going away for the weekend"), or references to physical proximity (e.g., "because Catherine's mom was nearer"), or to sheer chance (e.g., "maybe she wanted both, but it happened to choose Catherine"). The *preference* category included all references to a preference, might it be based on a general affective judgement (e.g., "because she liked Catherine better", "because they were good friends"), on more specific friendship-related factors (e.g., "because they know each other for a longer time", "because she likes to play with this one better"), on material grounds (e.g., "because he wanted to play with his toys"), or even when the preference was directed to the *other* friend (e.g., "because she didn't want to go to Jane's house because she has been there many days and now she wanted to go to this one's house"). The *non-response* category included "don't know" answers and other answers that did not address why one of

⁶⁴ See Appendix H2 for a list of the verbatim answers.

the friends was approached instead of the other (e.g., “because his [target-child’s] parents were travelling that weekend”).

Only a small minority (3%) of the explanations were coded in more than one category by at least one of the judges. The percentages of inter-judge agreement were very high, both for instances coded in just one category (99% agreement) and instances coded in multiple categories by at least one of the judges (90% agreement). The Cohen’s kappa coefficient of inter-judge agreement was calculated for the explanations that were coded in a single category (i.e., for which the categories functioned as mutually exclusive), since those explanations represented the vast majority of the instances and this coefficient, by taking into account possible occurrences of agreement by chance, is a more solid estimate of true agreement. The obtained value of $\kappa = .98$ indicates an excellent level of inter-judges agreement (see e.g., Fonseca, Silva, & Silva, 2007). All disagreements were resolved through discussion between the two judges.

The frequencies with which each type of explanation was invoked per grade-level and condition are summarized in Table 7.

Condition	Situation	Preference	Non-response
Choice			
<i>preschoolers</i>	2	11	3
<i>2nd-graders</i>	3	9	4
<i>6th-graders</i>	2	13	1
<i>9th-graders</i>	4	11	0
<i>undergraduates</i>	1	14	0
No-choice			
<i>preschoolers</i>	11	1	3
<i>2nd-graders</i>	10	1	4
<i>6th-graders</i>	15	0	1
<i>9th-graders</i>	15	0	0
<i>undergraduates</i>	14	2	0

Table 7: Frequencies of situational and preference-related aspects and of non-responses invoked as behaviour explanations by participants of Study 2a.

Note. All n=15, except for 6th-grade in no-choice condition (n=16).

In all grade-levels preference-related aspects were predominant in the choice condition, and situational aspects were predominant in the no-choice condition. This result is

particularly interesting regarding preschoolers in the no-choice condition because it indicates that they were aware of the situational constraints, even though they have drawn a correspondent dispositional inference in the previous measure.

2.3.2.C) DISCUSSION

The results of the present study support the hypothesis under test. The younger group (i.e., preschoolers) inferred an attitude correspondent to the target-child's behaviour in both conditions, not taking the situational constraints into account. In fact, in this study, the correspondent inference in the no-choice condition is so strong that it is not statistically different from the correspondent inference in the choice condition. Importantly also, the correspondent inference in the no-choice condition did not originate in a faulty understanding or lack of recall of the constraints imposed by the situation, since the majority of the preschoolers accurately referenced those constraints while explaining the target-child's behaviour. In contrast, all other grade-levels attributed a correspondent attitude to the target-child only in the choice condition, using the situational information to adequately adjust the dispositional rating.

The results of this study, which align clearly with the theorized effects, are also statistically quite solid, replicating the pattern obtained in Study 1. These studies match with respect to the consideration of situational constraints in the dispositional inferences by participants of different grade-levels. The results of both studies taken together heighten confidence in the adequacy of the three-stage model in describing the processes involved in person perception. The model describes the *correction* operation as more demanding on the cognitive system and essentially rule-based (i.e., adjustment by the application of the discounting principle). The present data reveal that 7- to 8-years-old children, but not 5- to 6-year-olds, use situational information to differentially shape their dispositional characterization of an actor, which is logically consonant with the model assumptions.

It must be recognized, however, that the present study is not exempt of methodological problems. Probably the most crucial problem resides in the fact that the narrated story was more demanding on the preschoolers' cognitive system than for any other grade-level. Not only might the story plot have been more complex for preschoolers to understand, they were also the only grade-level who could not read and needed, thus, to retain the names of the characters in memory. Some important details were introduced in the procedure as an attempt

to mitigate this problem (e.g., the characters were introduced previously and the names recollection was trained; the story was played twice for the two younger groups; participants were asked to retell the story to ensure comprehension), but the alternative explanation that the results derived from different levels of cognitive-load induced solely by the material cannot be fully discarded. This alternative explanation alerts against concluding that young children are unable to apply the discounting principle because it is conceivable that their performances could be different with simpler stimuli. Yet this alternative explanation does not compromise the previously drawn conclusions about the validity of the model, since the crux of the model is the assumption of differential cognitive efficiency of the *characterization* and *correction* stages. In this regard it is inconsequential whether younger children do not perform correction because, being a demanding cognitive ability, they did not acquire it yet, or because they cannot use it yet.

One might also wonder whether the characteristics of the samples used in these two studies could have influenced the results. Although there is no particular reason to suppose that basic cognitive processes, like the ones under focus, vary according to demographic characteristics, it is a fact that the used samples are very homogeneous in terms of socio-economical background (which is useful for comparisons between groups), but are also biased by containing almost exclusively participants of medium-high socio-economical status. In studies with young children and small samples, this type of variable may acquire a particular importance. A sample effect may be produced just by the fact that children participants were at a different developmental level than their counterparts in age who did not participate, due for example to differences in cognitive stimulation (e.g., Ruble, Newman, Rholes, & Altshuler, 1988). However, if the present study was affected by such a sample effect (i.e., biased towards more cognitively stimulated children), one would expect to obtain similar results, or even more accordant with the hypothesis, with a more heterogeneous sample. In Study 2b a sample of participants with different demographic characteristics completed the same experimental procedure of the present study, in order to explore possible sample-related effects and to examine the robustness of the conclusions drawn so far.

Finally, a note on the behaviour explanation measure. The results of this measure in the present study, especially the ones obtained with preschoolers, speak for the importance of disentangling dispositional inference tasks from attributional tasks. Although young children inferred a disposition correspondent to the target-child's behaviour in the no-choice condition, they correctly explained the behaviour in terms of situational forces. Moreover, it is interesting that, in such a blatant attributional task, preschoolers did not preferentially explain

the target-child's behaviour situationally, nor did 2nd- or 6th-graders prefer dispositional explanations, as one would expect from the behavioural prediction studies in the developmental literature. Again, behavioural predictions may not be mediated by dispositional inferences and so predicting behaviour inline with the situations (as preschoolers usually do) may not derive from a *situationism bias*, but rather from an *egocentric bias*. Simultaneously, an unwarranted dispositional inference (as the one preschoolers drew in the present study) may also not mean that the situational factors are globally neglected as explanations for behaviours, as manifested in the attributional task.

2.3.3. STUDY 2B – WEEKEND WITH A FRIEND (REPLICATION)

As discussed earlier, there was no particular theoretical argument that allowed raising the hypothesis that results in the previous study could have been different if another sample of participants, with different socio-economical backgrounds, was used. Nonetheless, a replication of the previously obtained results with another sample and with other experimenters would enhance confidence in the reliability of the results, while a failure at replicating would advise for the resumption of the hypothesis testing with other means of operationalization of the concepts. Therefore, the same ontogenetic prediction derived from the three-stage model of person perception was tested, once again, in the present study.

2.3.3.A) METHOD

Participants

Participants in this study were 36 preschoolers, 28 sixth-graders, and 22 adults. In the present study, to maintain consistency of designations across studies, the term *grade-level* will still be used, but the term is only partially applicable, as not all adults were undergraduates in this study. Major demographic characteristics (age and gender) of each grade-level are summarized in Table 8.

The data set of Study 2b was collected by 18 experimenters, all of them undergraduate students attending a course on person perception and interpersonal relations as part of a research assignment. Each experimenter ran on average five experimental sessions. The majority of the preschoolers (81%) and some sixth-graders (43%) were recruited at their

schools. In these cases interested parents signed consent forms. The remaining children, as well as all the adults, were acquaintances or relatives of the experimenters, and permissions were given orally. The sample in this study is much more heterogeneous in terms of socio-economical status than the previous sample, and a substantial number of preschoolers (65%) came from more disadvantaged backgrounds. The adults sub-sample is also much more heterogeneous in terms of age and occupations than in Study 2a.

Grade-level	n	Age			Gender	
		<i>M</i>	<i>SD</i>	<i>[min; max]</i>	males	females
preschool	36	5y 9m	5m	[4y 11m; 6y 7m]	17 (47%)	19 (53%)
sixth	28	11y 7m	5m	[10y 9m; 12y 2m]	11 (39%)	17 (61%)
adults	22	29y	15y	[17y; 59y]	10 (45%)	12 (55%)

Table 8: Descriptive statistics concerning age (mean, standard deviation, minimum and maximum values) and gender (frequencies and percentages) of Study 2b participants
Note. y = years, m = months.

Material

The material and experimenter script for this study were the same as for the previous study.

Procedure

The procedural guidelines were the same as for Study 2a. The major procedural differences of this study, relatively to the previous one, were the use of multiple experimenters and the variability of the experimental settings (e.g., different rooms). Experimenters did not reliably record the participants' answers to the control questions after the first viewing of the animation, and therefore data on the preliminary understanding and memory for the story details cannot be presented.

Design

3 *grade-levels* (preschool vs. 6th-grade vs. adults) × 2 *conditions* (choice vs. no-choice) × 2 *versions* (female vs. male).

Dependent Measures

The dependent measures for this study were the same as for the previous study, namely a 7-point pictorial scale for the *dispositional ratings* and an open-ended question for the *behaviour explanations*.

2.3.3.B) RESULTS

Dispositional ratings

Figure 4 depicts the mean values of the dispositional ratings obtained in this study. The present data were analysed using tests similar to the ones applied in the previous two studies. The Levene's test for homogeneity of variances indicated that variances were not equal across experimental cells, Levene's $F(11, 74) = 6.89, p < .001$.⁶⁵ Thus, a 3 (grade-level) \times 2 (condition) \times 2 (version) ANOVA performed on the rank-transformed data was again preferred to the same test performed on the raw data.⁶⁶

The ANOVA revealed a grade-level main effect, $F(2, 74) = 4.34, p = .017, \eta_p^2 = .105$, whereby preschoolers attributed to the target-child overall a more positive attitude towards the host friend than sixth-graders and adults, $t(74) = 2.73, p = .008, \eta_p^2 = .092$.⁶⁷ The choice factor produced the expected significant main effect, $F(1, 74) = 6.52, p = .013, \eta_p^2 = .081$, with less extreme attitudes being attributed in the no-choice condition.

⁶⁵ See Appendix II for material related with the ANOVA assumptions.

⁶⁶ Unlike the previous studies there were two noteworthy differences in the results obtained by the two types of ANOVAs. The grade-level main effect did not attain significance with the raw data ANOVA and the contrast performed between conditions for the 6th-grade is also non-significant in this ANOVA. However, these results do not challenge the conclusions drawn from the results of the rank-transformed data ANOVA, especially because the contrasts performed against the midpoint of the scale (with the raw data ANOVA) are totally consonant with these conclusions. See Appendix II for the full ANOVA tables and contrast analyses.

⁶⁷ Contrast of the lower grade-level against the two higher (coefficients: -2, 1, 1).

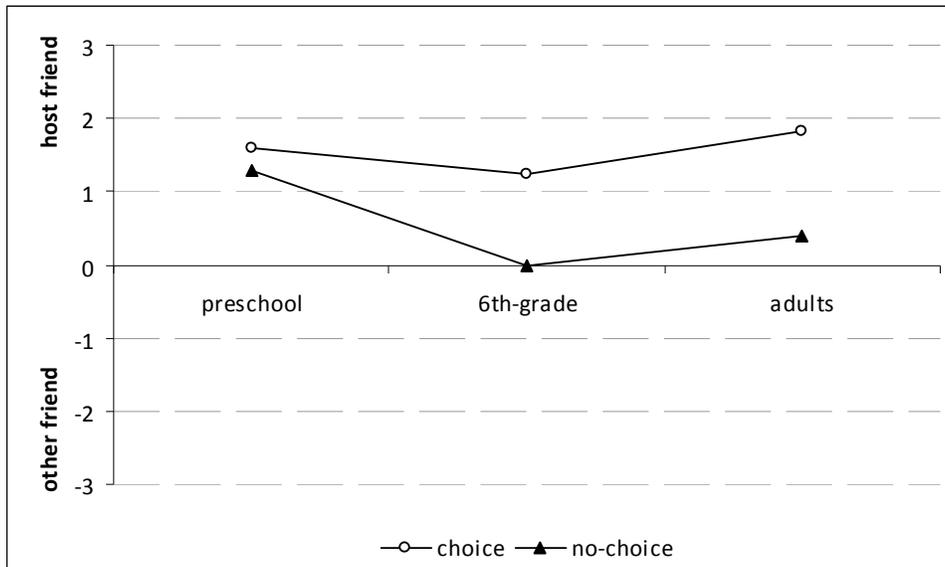


Figure 4: Mean dispositional ratings of each grade-level in the two experimental conditions of Study 2b

The test statistics of the contrast analysis that allows for the test of the hypothesis are inscribed in Table 9. As predicted, preschoolers' dispositional ratings did not differ according to experimental condition, while older participants' ratings (i.e., 6th-graders' and adults') did differ, reflecting the consideration of the situational constraints.

Group	Condition	<i>n</i>	<i>M</i>	Descriptive		Contrasts		
				95% CI	<i>SD</i>	<i>t</i> (74)	one-tailed <i>p</i>	η_p^2
preschoolers								
	<i>choice</i>	15	1.60	[0.26; 2.94]	2.41	< 1		.005
	<i>no-choice</i>	21	1.29	[0.17; 2.40]	2.45			
6 th -graders								
	<i>choice</i>	17	1.24	[0.52; 1.95]	1.39	1.80	.038	.042
	<i>no-choice</i>	11	0.00	[-0.60; 0.60]	0.89			
adults								
	<i>choice</i>	12	1.83	[1.08; 2.59]	1.19	1.87	.033	.045
	<i>no-choice</i>	10	0.40	[-0.68; 1.48]	1.51			

Table 9: Descriptive statistics of the dispositional ratings (means, 95% confidence intervals, and standard deviations) and test statistics with respective *p*-values and effect sizes for the contrasts between conditions in Study 2b

Moreover, preschoolers again demonstrated the correspondence bias, as evidenced by the contrast of the dispositional ratings in the no-choice condition and the midpoint of the scale, $t(74) = 3.09$, $p = .003$, $\eta_p^2 = .115$, while older participants did not, both $t < 1$.⁶⁸

Behaviour explanations

The coding system used in the previous study was applied to the explanations of the target-child's behaviour given by this new sample of participants.⁶⁹ Again, explanations coded in more than one category by at least one of the judges were a minority (2%). The percentage of inter-judge agreement for these explanations was somewhat smaller than in the previous study (83% agreement), but both the agreement percentage (98% agreement) and Cohen's inter-judges agreement coefficient $\kappa = .95$ concerning the majority of the explanations granted confidence in the performed coding. All disagreements were resolved through discussion between the two coders. The frequencies of statements coded as referring to *situation*, *preference*, or as a *non-response* are presented in Table 10.

Condition	n	Situation	Preference	Non-response
Choice				
<i>preschoolers</i>	15	1	14	0
<i>6th-graders</i>	17	3	14	0
<i>adults</i>	12	2	11	0
No-choice				
<i>preschoolers</i>	21	13	8	0
<i>6th-graders</i>	11	8	2	1
<i>adults</i>	10	10	1	0

Table 10: Frequencies of situational and preference-related aspects and of non-responses invoked as behavioural explanations by participants of Study 2b.

Again, preference-related aspects were predominant in the choice condition, and situational aspects were predominant in the no-choice condition for all grade-levels. In the present sample, however, more preschoolers in the no-choice condition mentioned a preference of the target-child (38%) in comparison to the previous study (5%). While this finding does not have a clear interpretation (e.g., it may be due to sample characteristics, but also to procedural differences between experimenters), it is still the case that the majority of

⁶⁸ See Appendix I1 for the contrasts against the midpoint of the scale.

⁶⁹ See Appendix I2 for a list of the verbatim answers.

the preschoolers referred to situational constraints, although preschoolers, as a group, demonstrated the correspondence bias on the previous measure.

2.3.3.C) DISCUSSION

The most interesting feature of the present study is that it was conducted with a sample of participants whose characteristics differed somewhat from the samples of the two previous studies (especially in terms of socio-economical backgrounds and age ranges), and still the pattern of results was fully consistent both with the results of these other studies and with the established hypothesis. Hence, this study contributes substantially to sustain the confidence in the conclusions drawn from the previous studies, particularly the younger children's tendency to attribute dispositions to actors that are not adjusted by the consideration of situational constraints, while older children, adolescents and adults alike, use the situational information to shape their dispositional inferences. This finding was obtained using two different paradigms (i.e., *silent interview* and *attitude attribution*), two different types of dispositional factors (i.e., traits and attitudes), different material (i.e., non-verbal and verbal), different types of situational constraints (i.e., emotion-inducing situation and no-choice situation), and samples of participants with different characteristics. Moreover, confidence in the reliability of the findings and of the paradigms used warrants their use in exploration of other potentially interesting variables.

It may be interesting to note that the results of Study 2a and Study 2b offer support to the previously mentioned hypothesis formulated by Costanzo and collaborators' (1974), which did not gather empirical support in the study by the same authors [SEE SECTION 2.3.2]. As mentioned previously, one of the major differences between Costanzo and collaborators' study and these two studies, which may explain the divergent results, concerns prior expectancies. Moreover, in Study 1 of the present research project, prior expectancies could have been involved in the unexpected results of the dispositional ratings measure with preschoolers and second-graders.

Hence, Study 3 was designed using the same paradigm of Studies 2a and 2b, with the aim of scrutinizing the role played by prior expectancies in the dispositional ratings of differently-aged participants.

2.3.4. STUDY 3 – WEEKEND WITH ONE’S BEST FRIEND

As discussed in the introduction of Study 2a [SEE SECTION 2.3.2], in Costanzo and collaborators’ study (1974) young children correctly inferred, in the choice condition, that the target-child wanted to play with the toy she had played with and, in the no-choice condition, that she did not want to play with the toy she played with. The authors took these results as an indication that even young children are quite sensitive to *choice cues* and do not rely as much in the *behavioural cues* as previously hypothesised. However, in this study prior expectancies and situational constraints were confounded, since in the choice condition the behaviour was consistent with the expectancy (i.e., pro-expectancy) and in the no-choice condition the behaviour was inconsistent with the expectancy (i.e., anti-expectancy).

In Study 1 of the present research project, it was also the case that prior expectancies about the target-child’s dispositions could have influenced the dispositional ratings, albeit not having been confounded with situational constraint information. Assuming that people have a generalised expectancy that children are happy, the target-child’s behaviour was anti-expectancy in both levels of the situational constraints variable.

So, in Studies 2a and 2b situational constraints and prior expectancy variables were disentangled by eliminating any basis for prior expectancies. Although results do not show that young children are totally insensitive to choice cues (especially in Study 2a), this sensitivity was not large enough to attain statistical significance. Moreover, the expected age-related trends in the consideration of situational constraints (predicted in the framework of the three-stage model, but also in the Piagetian framework used by Costanzo et al., 1974) was obtained and replicated. It seems, thus, that separating the two variables was a sound option.

Following these results, the conditions for re-examining the eventual role played by prior expectancies, in the attitude attribution paradigm with children, were gathered. With a minor change in the paradigm of the Study 2, it was possible to vary prior expectancies about the target-child’s dispositions, keeping the level of situational constraints constant (i.e., at no-choice level).

Based on previous findings with adults (e.g., Jones et al., 1971; Weisz & Jones, 1993), discussed in the theoretical framework section of this dissertation [SEE SECTION 2.2.5.D], it was expected that older participants (i.e., 6th- and 9th-graders) would draw dispositional inferences inline with prior expectancies. On the other hand, based on Costanzo and collaborators’ findings (1974), and on Study 1 results, it was expected that younger children’s (i.e., preschoolers’ and 2nd-graders’) dispositional ratings would match prior expectancies, too.

Hence, the hypothesis guiding this study stated that the dispositional ratings of the target-child should reflect the prior expectancy, and not the situationally constrained behaviour, at all grade-levels.

OVERVIEW

Participants watched once more a short animation video telling the story of a target-child who stated joy over spending a weekend with the host friend [*behavioural information*]. During the narration of the story participants learned that the target-child was closer to one of the friends [*prior expectancy*]. In one of the experimental conditions, that friend would then become the host friend because the other friend was unavailable [*pro-expectancy condition*], and in the other condition the reverse would happen [*anti-expectancy condition*], creating a situation where the target-child's behaviour would either agree or disagree with the prior expectancy. After watching the story, participants were asked to make *dispositional judgements* about the target, indicating the true attitude of the target-child towards the host friend, and to explain their rating.

It was expected that all participants would attribute a more positive attitude to the target-child towards the closer friend, independently of the stated behaviour.

2.3.4.A) METHOD

Participants

Participants in this study were 31 preschoolers, 30 second-graders, 30 sixth-graders, and 30 ninth-graders. A sample of undergraduates was not included in this study because in the previous studies no substantial differences between ninth-graders' and undergraduates' performances were found, and there were no theoretical reasons to expect a difference between the two groups in the present study. Major demographic characteristics (age and gender) of each grade-level are summarized in Table 11. Participants came from the same school and were recruited with the same procedures as in Studies 1 and 2a.

Grade	Age			Gender	
	<i>M</i>	<i>SD</i>	[<i>min</i> ; <i>max</i>]	males	females
preschool	5y 9m	4m	[5y 1m; 6y 3m]	14 (45%)	17 (55%)
second	7y 8m	4m	[6y 8m; 8y 1m]	13 (43%)	17 (57%)
sixth	11y 3m	7m	[10y 4m; 12y 3m]	14 (47%)	16 (53%)
ninth	14y 8m	5m	[14y 0m; 15y 3m]	12 (40%)	18 (60%)

Table 11: Descriptive statistics concerning age (mean, standard deviation, minimum and maximum values) and gender (frequencies and percentages) of Study 3 participants

Note. All n=30, except for preschool (n=31). y = years, m = months.

Material

The material for this study consisted of the story created for Study 2 with an addition of two initial slides. These slides served to introduce the prior expectancy that the target-child had a more positive attitude towards one of the friends. This was done by presenting one of the friends as spending more time and being closer to the target-child. The content of the story was then identical to the story of Study 2 in the *no-choice condition*, namely the target-child could not choose with whom to stay during the weekend since only one of the friends was available. In the *pro-expectancy condition* the host friend would be the one introduced as the closest friend of the target-child, while in the *anti-expectancy condition* the host friend would be the other (not preferred) friend. The story ended with the same behavioural expression by the target-child, namely of joy over spending the weekend with the host friend.⁷⁰

There were again four versions of the story, according to gender of participant (female and male versions) and experimental condition (pro- and anti-expectancy versions). The only differences between the audio narrations of the four versions corresponded to the names of the characters. The stories were presented on an ASUS laptop, connected to a pair of speakers, running Microsoft Office PowerPoint 2003.

Procedure

The procedure of this study was identical to the procedure of Study 2a until the point where participants finished watching the animated story for the first time.⁷¹ Then, instead of being asked to retell the story, participants were asked three control questions aimed at checking participants' memory (1) for the expectancy, "Who was friends at school?", (2) for

⁷⁰ The animation storyboard and narration text and can be found in Appendix J1.

⁷¹ There was a slight difference in the way the child-characters were introduced by the experimenter, in order to strengthen the prior expectancy. See Appendix J2 for the text used to introduce the characters.

the situational constraint, “Who’s not going to be here for the weekend?”, and (3) for the direction of the behaviour, “With whom will Agnes [target-child] stay?”. A considerable percentage of participants answered the three questions correctly (preschool: 68%; 2nd-grade: 77%; 6th-grade: 93%; 9th-grade: 97%), and no participant failed all three questions. Preschoolers had again more difficulties with the situational constraints control question (23% wrong answers), while second-graders failed more on the prior expectancy control question (20% wrong answers), most of the time stating that all three children attended the same school. Curiously, given the amount of mistakes in the analogous question of Study 2a, the percentage of mistakes in the behaviour direction control question was extremely low (preschool: 3%; all other grades: 0%). Again, the higher number of mistakes by preschoolers was not surprising, since they could not read the characters’ names from the cards. The correction of mistakes by the experimenter and the second viewing of the animation by all preschoolers and second-graders aimed at enhancing participants’ memory and understanding of the story. Older participants saw the story a second time only when they failed one of the questions.

The rest of the procedure was once again identical to Study 2a, with participants answering the dependent measures and the experimenter taking note of the answers.

Design

Participants within each grade-level and gender were distributed randomly across two levels of the prior expectancy variable. The resulting design can be formalized as follows: 4 *grade-levels* (preschool vs. 2nd-grade vs. 6th-grade vs. 9th-grade) \times 2 *conditions* (pro-expectancy vs. anti-expectancy) \times 2 *versions* (female vs. male).

Dependent Measures

Dispositional ratings. The attitude attribution measure for the present study was identical to the one of Study 2.⁷² The only difference regards the fact that, in this study, the host friend was not always the same friend (pictured at the right half of the scale). According to condition, the host friend was sometimes the friend on the right half of the scale and other times the friend on the left half. In these latter types of trials the scale had to be coded inversely (i.e., from +3 to -3) in order to keep the assignment of positive values for the *host* friend.

⁷² See Appendix K for an exemplar of the coding sheets.

Justifications. After responding to the first dependent measure, participants were invited to justify their answer with the question, “Why do you think Agnes [target-child] would prefer to stay with _____?”. This measure was included mainly to verify whether participants would invoke the prior expectancy. Due to the experimenter’s mistake some of the answers (3 preschoolers’, 10 2nd-graders’, and 7 9th-graders’ answers) were not recorded.

2.3.4.B) RESULTS

Dispositional ratings

The hypothesis tested in the present study stated that younger children, as older children and adolescents, would attribute attitudes inline with a relevant prior expectancy in a no-choice scenario, even when behaviour countered that expectancy. Some descriptive statistics and test statistics are summarized in Table 12. Please recall that positive numbers indicate again dispositional ratings aligned with the behaviour (i.e. preference for the *host friend*), negative numbers denote ratings that counter behaviour (i.e., preference for the *other friend*), and values close to zero mean the absence of a perceived preference.

Group	Condition	Descriptive			Contrasts		
		<i>M</i>	95% CI	<i>SD</i>	<i>t</i> (105)	one-tailed <i>p</i>	η_p^2
preschoolers							
	<i>pro-expectancy</i>	1.40	[0.18; 2.61]	2.20	4.80	< .001	.180
	<i>anti-expectancy</i>	-1.50	[-2.76; -0.24]	2.37			
2 nd -graders							
	<i>pro-expectancy</i>	1.80	[0.93; 2.67]	1.57	5.56	< .001	.228
	<i>anti-expectancy</i>	-1.73	[-2.63; -0.83]	1.62			
6 th -graders							
	<i>pro-expectancy</i>	1.40	[0.68; 2.12]	1.30	4.48	< .001	.161
	<i>anti-expectancy</i>	-1.53	[-2.16; -0.91]	1.13			
9 th -graders							
	<i>pro-expectancy</i>	1.33	[0.84; 1.83]	0.90	4.30	< .001	.150
	<i>anti-expectancy</i>	-1.60	[-2.06; -1.14]	0.83			

Table 12: Descriptive statistics of the dispositional ratings (means, 95% confidence intervals, and standard deviations) and test statistics with respective p-values and effect sizes for the contrasts between conditions in Study 3

Note. All n=15, except for preschool in anti-expectancy condition (n=16).

Similarly to the previous studies, variances in the dispositional ratings across grade-levels were not homogeneous, resulting in heterogeneity of variances within-cells of a 4

(grade-level) \times 2 (condition) \times 2 (version) ANOVA, Levene's $F(15, 105) = 3.58, p < .001$.⁷³ Therefore an ANOVA on the rank-transformed dispositional ratings was preferred to an ANOVA with the raw data.⁷⁴

As predicted the only statistically significant effect was the main effect of condition, $F(1, 105) = 91.57, p < .001, \eta_p^2 = .466$, whereby participants of all grade-levels⁷⁵ considered that the target-child had a more positive dispositional attitude towards the expectancy-consistent friend, independently of whether the positive stated attitude was directed to that or to the other friend. There was no main effect of grade-level and, once again, no effect of version or significant interactions, all $F < 1$.

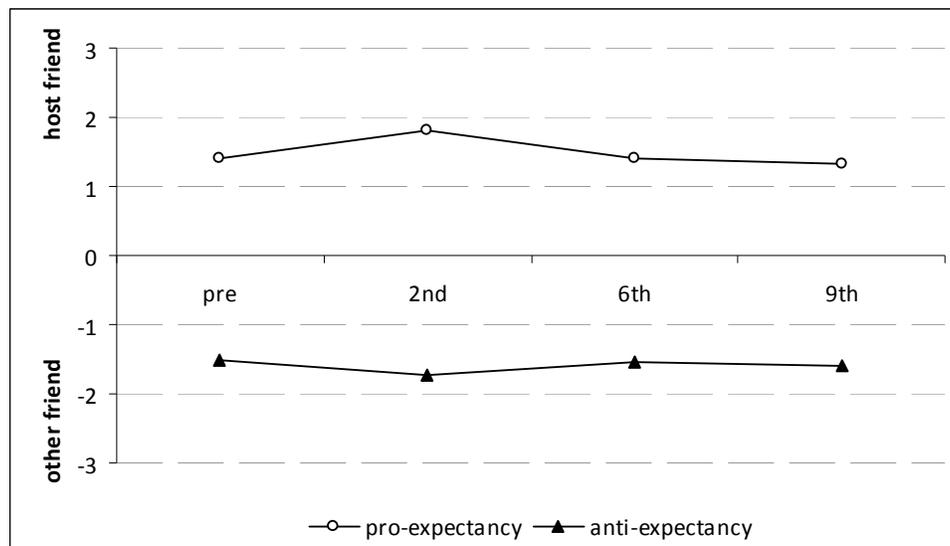


Figure 5: Mean dispositional ratings of each grade-level in the two experimental conditions of Study 3

The contrast analysis against the midpoint of the scale⁷⁶ revealed that all grade-levels attributed an attitude clearly aligned with the prior expectancy and counter to the behaviour in the anti-expectancy condition. This finding is particularly interesting in the preschoolers group, indicating that this time, in a no-choice condition, they did not demonstrate the correspondence bias, $t(105) = 3.28, p = .001, \eta_p^2 = .093$.

⁷³ See Appendix L1 for the Levene's tests per effect.

⁷⁴ The ANOVA performed on the raw data produced the same significant results. See Appendix L1 for both ANOVA tables and for the contrasts calculated with the raw data.

⁷⁵ See contrasts for each grade-level in Table 12.

⁷⁶ See contrasts against the midpoint of the scale for each grade-level in Appendix L1.

Justifications

The justifications offered by the participants for their dispositional ratings were coded by two independent judges as referring to situational, behavioural, expectancy-related, or egalitarian-related aspects.⁷⁷ Once again, categories were not mutually exclusive, but exhaustive, in the classification of the answers. The *situational* category included references to the constraints present in the situation, namely the unavailability of one of the friends (e.g., “because this one couldn’t and so she had to go to this one’s house”). The *behaviour* category included references to the target-child’s statement of joy over spending the weekend with the host friend, independent of whether it was interpreted as true excitement (e.g., “because he said in the story that he would like very much to stay”) or as lack of excitement (e.g., “...nor did she say “Great! That’s what I wanted!”). The *expectancy* category included all references to the induced expectancy that the target-child was closer to one of the friends than to the other, both when it was used to justify an expectancy-congruent dispositional rating (e.g., “because they are best friends at school”) or an expectancy-incongruent rating (e.g., “because she never went to Jane’s house and wanted to get to know the house and Jane’s dad”). Finally, the *egalitarian* category included all of the answers that faded the friendship differences between the three characters (e.g., “because they were all friends”; “...it’s just because Catherine goes to the same school, that they spend more time together, but the friendship is the same”) or that implied that the target-child would like to strengthen the friendship with the other friend (e.g. “because Catherine was a good friend, but Jane was also a friend and she didn’t have as many opportunities to be with her”).

In contrast with the previous studies, a larger number of justifications (19%) were coded in more than one category by at least one of the judges. However, these instances were still a minority and the percentage of inter-judge agreement was considerably high (84%). For the rest of the justifications, which were coded in a single category, the judges agreed 98% of the times, yielding a Cohen’s kappa coefficient of $\kappa = .85$. The final coding of the previous disagreements was in all cases settled by discussion between the two coders. Table 13 shows the frequencies of each category in the participants’ answers per grade-level and condition.

⁷⁷ See Appendix L2 for a list of the verbatim answers.

Condition	<i>n</i>	Situation	Behaviour	Expectancy	Egalitarian
Pro-expectancy					
<i>preschoolers</i>	13	1	0	11	3
<i>2nd-graders</i>	10	1	1	9	0
<i>6th-graders</i>	15	0	0	15	4
<i>9th-graders</i>	11	0	2	9	4
Anti-expectancy					
<i>preschoolers</i>	15	1	0	12	3
<i>2nd-graders</i>	10	0	0	9	1
<i>6th-graders</i>	15	1	1	13	4
<i>9th-graders</i>	12	0	0	12	1

Table 13: Frequencies of situational, behavioural, expectancy- and egalitarianism-related aspects invoked as justifications for the dispositional ratings by participants of Study 3.

In all grade-levels, and for both conditions, the substantial majority of the dispositional ratings justifications included a reference to the prior expectancy. This result strengthens the idea that target-related prior expectancies play an important role in the dispositional inference process, at least in what refers to intentional inferences, from rather early on in the ontogenesis.

2.3.4.C) DISCUSSION

The hypothesis that participants of all grade-levels would produce dispositional ratings of an actor aligned with the prior expectancy, even if the situationally constrained behaviour countered this expectancy, received empirical support from the data of the present study.

On the one hand, this normatively correct finding is hardly surprising from a logical point of view and, thus, much less surprising for older participants (i.e., 6th- and 9th-grade). In the stimulus material, the target-child's behaviour was not diagnostic of his/her dispositions, since it was performed under situational constraints. The induced prior expectancy, conversely, could be considered diagnostic of the target's disposition and was used by the participants to define it.

On the other hand, this finding is somewhat curious both for older and younger participants. Considering older participants, this normatively correct performance contrasts with the repeatedly obtained correspondence bias (e.g., Jones & Harris, 1967), even when a

relevant target-based prior expectancy was present (e.g., Jones et al., 1971). However, in the previous studies of this research project, older children, adolescents, and adults never demonstrated the bias. As discussed earlier, the many differences between the present version of the paradigm and the original one used with adults may be sufficient to produce this lack of bias. Some of these differences, besides the ones already mentioned [SEE SECTION 2.3.2], reside in the expressed behaviour (i.e., the argumentative essay was here a set of two declarative sentences), in the type of situational constraints (i.e., instead of an assignment, the constraints here were *harder*, in the sense that one of the friends was unavailable), and in the measurement scale (i.e., here the midpoint of the scale was very salient). Moreover, it should be noted that in the original study (i.e., Jones & Harris, 1967), as well as in other attitude attribution studies with adults in which a choice condition was available for comparison, the participants' performances always showed signs of situational adjustment, albeit insufficient. In other words, the correspondence bias manifested in those studies is a consistent but rather small effect.

Regarding younger participants (i.e., preschoolers), the present results are particularly remarkable considering that what is visible and concrete in the moment tends to be very salient for young children. In Studies 2a and 2b, for example, preschoolers did not dismiss the target-child's behaviour in the presence of situational constraints as all together non-diagnostic. Moreover, in numerous other studies (e.g., in Piaget's conservation tasks; Piaget & Inhelder, 1941) young children typically have difficulty detaching themselves from the observed state of affairs. In the present study, though, preschoolers avoided the correspondence bias they exhibited in the previous studies, indicating that they relied more heavily on the prior expectancy than in the observed behaviour.

One of the main shortcomings of the present study is that it does not explore all possible relations between prior expectancy and observed behaviour. What would happen in cases in which the behaviour was not situationally determined (i.e., in a choice condition) but countered a prior expectancy, is still to be explored. However, the present purpose, within the three-stage model framework, was to examine how differently-aged participants perform dispositional characterization in view of situational constraints. In Studies 1 and 2 unconstrained behaviour conditions were included in order to provide a relevant baseline. In Study 3, on the other hand, varying the accordance between behaviour and prior expectancy was adequate for studying the impact of this variable in dispositional characterization from constrained behaviour, particularly because the results of characterization without prior expectancies were already known from Studies 2a and 2b.

The results of the present study pose some problems to the three-stage model of person perception, in that the more automatic operations in the model should be performed by young children and, thus, dispositional characterization should have followed behavioural categorization. Instead, preschoolers' dispositional characterization followed the prior expectancies. One highly plausible idea is that dispositional inferences can be drawn very easily and efficiently from prior expectancies, which is consonant with the preschoolers' performance at the present task (and also with the 1st-graders' performance at Costanzo et al., 1974). Concurrently, the results of Study 2, the previously reviewed developmental literature [SEE SECTION 2.2.7.D], and the adult literature on STIs [SEE SECTION 2.2.6.B], all show that dispositional inferences can also be drawn efficiently and by young children from behaviour. One interesting question then is how the two kinds of dispositional inferences (i.e., originating in prior expectancies or in behaviour) affect each other mutually. A detailed speculation of the possible mechanisms underlying this coordination (e.g., via inhibition, facilitation, integration, etc.) and of the variables that may moderate it (e.g., congruency between expectancy and behaviour, primacy of the inferences, strength of the expectancies) is not necessary here, since whole bodies of literature, such as impression formation, person memory and more recently STI literatures, have addressed these questions in great detail.

The major contribution that the present studies can provide regarding the findings of the referenced literatures, is that dispositional inferences based on prior expectancies seem to occur ontogenetically early, pointing at their eventual high efficiency. Moreover, when prior expectancies are pitted against observed behaviour (e.g., Study 3, and possibly Study 1 and Costanzo et al., 1974), the young children's inferences based on the expectancies seem to prevail over the ones based on behaviour.

It may be the case that the way both types of dispositional inferences interact changes developmentally, or that one type of inference becomes predominant while the other remains as residual. In such cases, the three-stage model could be an adequate model of adult person perception, but would still gain in completeness and validity by integrating variables that would explain differential performances across the life-span. Before discussing more broadly the implications of the present results [SEE SECTION 2.4], however, a brief summary of the results obtained in this set of studies follows.

2.3.5. SUMMARY

In the empirical studies included in the *theory-to-data* part of the present dissertation, it was tested whether young children perform dispositional characterization without correcting for situational constraints, while older children already perform situational correction. Study 1, using the *silent interview* paradigm, suggests that the situational correction operation has a later ontogenetic onset than dispositional characterization. Yet, it also suggests that dispositional characterization is not necessarily correspondent with behavioural categorization at rather early stages of the ontogeny. Studies 2a and 2b, using the *attitude attribution* paradigm, indicate more definitively that situational correction ontogenetically follows dispositional characterization. Study 3, again using the *attitude attribution* paradigm, reveals that dispositional characterization, when behaviour is situationally constrained, matches prior expectancies and not behavioural categorization from rather early on in the ontogeny.

In the *theory-to-data* part of this dissertation the main goal was to illustrate how research conducted with children can be useful for testing end-state social cognitive models. This illustration was placed within the framework of dual-process models, where it can be expected, particularly for the class of corrective models, that more deliberate processes will have an ontogenetic later onset than automatic processes. The specific model used here was the three-stage model of person perception (Gilbert, Pelham et al., 1988). This model centres on the dispositional inference process, and successfully explains adults' performances across a variety of experimental procedures, whereby although the observed behaviour of an actor was situationally constrained, a dispositional inference correspondent to the behaviour is still drawn (i.e., the correspondence bias). According to the three-stage model, correspondent inferences about the actor are made in a dispositional inference task because they are cognitively easy to make, while considering alternative factors that may have produced the behaviour is more demanding. As such, it was predicted that, in dispositional inference tasks, the process involved in situational correction would manifest its operation ontogenetically later than the dispositional characterization process.

Testing this prediction with differently-aged participants illustrated two ways, at least, in which this type of experimental population can be useful for social cognitive processes modelling. First, the outcomes of the studies allowed for a test of the above mentioned ontogenetic prediction. By conforming to the prediction, these results provide the model with convergent evidence for its validity. Moreover, this evidence does not constitute merely cumulative knowledge favouring the model as an end-state model, but it extends its plausibility across the ontogeny.

Secondly, the outcomes of the studies also allowed for insights about the importance of variables that are not currently contemplated in the model. By not conforming totally to the assumptions of the model, namely that dispositional characterization follows correspondently from behavioural categorization, these results instigated the exploration of the eventual role played by a not-modelled variable (i.e., prior expectancies) in the dispositional characterization of an actor. This variable seems to have a substantial impact in younger children's judgements and, as such, it supports raising the hypothesis that it may still be important, at an automatic level, in adults' dispositional characterizations, even if its impact is more flexible and diluted in the adult functioning.

All together, these results foster the idea that social cognitive models are incomplete unless they consider performances at ontogenetic moments other than adulthood. In the present case, for example, conducting more studies with children on the topic of how prior expectancies and behavioural categorization combine in a dispositional characterization would be of great use in reaching for a more complete picture of the person perception processes.

Designing studies that will include participants from a wide range of ages while maintaining the stimulus material, tasks, and dependent measures, however, is not exempt of problems, and these problems were visible in the present studies. First, it is very hard (if not impossible) to assure that the presented material, instructions, and measurement techniques had identical meanings to each age-group. As discussed regarding Study 1 [SEE SECTION 2.3.1.C], for example, it is highly plausible that the sadness-inducing situations for the behavioural predictions measure had different meanings for differently-aged participants. This problem, however, is not exclusive to this type of studies. Trope's studies (1986), for example, discussed in the theoretical framework section [SEE SECTION 2.2.3.B] alert researchers to the possibility that the same behaviour will be perceived differently when accompanied by diverse situational information. As such, participants within the same age-level in the *choice* condition of an attitude attribution paradigm, for example, may perceive a different behaviour than participants in the *no-choice* condition.

A second problem, somewhat related to the previously mentioned one, is that the degree to which the experimental scenario is pertinent to the participants' life experiences can also vary with age. This pertinence, in turn, may be decisive to the extent to which participants base their judgements in projective or egocentric processes. Literature on adult egocentric biases (e.g., false consensus effect, Ross, Green, & House, 1977; perspective taking, Epley, Morewedge et al., 2004; the spotlight effect, Gilovich, Medvec, & Savitsky, 2000) call attention to the possibility that, in several cognitive domains, people use their own momentary status to understand or produce judgements about others. It is then plausible to assume that the same scenario may facilitate reliance on such egocentric processes (e.g., when children are thinking about a target-child of their own age) or restrain them (e.g., adults thinking about a target-child).

One third problem may have important implications for the interpretation of results in the framework of dual-process models. The majority of this type of model concerns processes that have differential levels of vulnerability to available cognitive resources. The idea at the origin of this research project was that some of the more deliberate processes, being more

dependent on cognitive resources and complex cognitive abilities, would be acquired later in the ontogeny. Hence, the automatic processing would be more visible in children's performances because it was not yet shaped and adjusted by the more deliberate processes, still to be acquired. But another possibility is that the exact same experimental task will be more demanding for younger children, who have fewer available cognitive resources, thus corrupting children's more deliberate processes. In such a case, children participants would be functioning as *natural* cognitively loaded participants.

For the present three studies, this problem may have had two immediate implications. On the one hand, two paradigms traditionally used in the study of the correspondence bias (i.e., *silent interview* and *attitude attribution* paradigms) did not obtain the bias with participants older than preschoolers. While it may have been preferable, in terms of reliability, to use an adaptation of the paradigm that could replicate the correspondence bias with older participants, such an adaptation seemed to be too difficult for young children to process. The experimental task had to be simplified to be manageable for young children, even if this simplification simultaneously meant abdicating a central, but typically small, effect with adults. More importantly, had the chosen task not promoted situational correction among adults, then it would not have allowed for a visible differentiation between adults' and children's performances. In this perspective, a paradigm in which adults would perform full correction was methodologically the most interesting option for the present purposes, and thus the no-replication of the correspondence bias with older participants can be considered more advantageous than problematic for comparing younger and older participants' responses.

On the other hand, the differential levels of demand on cognitive resources between age-levels do not allow untangling whether preschoolers in the present studies had not yet acquired the correction process or whether they had already acquired it but could not use it, due to the unavailability of enough cognitive resources. For the present purposes, namely testing the three-stage model of person perception, however, the adequacy of each one of these alternative explanations, does not influence the interpretation of the obtained results regarding the validity of the model. The finding that younger children do not adjust their dispositional ratings with situational information, may it be because they still do not *know* the correction rule or because they cannot apply it, while older children do the adjustment, is consonant with the view that the correction operation is cognitively demanding.

There is still another question that may be answered in the framework of the availability of cognitive resources. An almost inevitable question while considering age-related data refers to what exactly is supposed to change with age. In the current research

project, this question would centre on the mechanisms that plausibly underlie the age-related change in the correction of dispositional inferences. As stated in the general introduction of this dissertation [SEE SECTION 1.2.3], exploring the developmental mechanisms that are responsible for the age-related differences is not part of the aims of this research project. Nonetheless, the question is pertinent and because there is a class of theories in developmental literature, namely the information processing theories (see e.g., Siegler, DeLoache, & Eisenberg, 2006), that have a good fit with the characteristics of the three-stage model, some speculative ideas may be advanced with some support.

Roughly, according to information processing theories of cognitive development, developmental changes, including both what may appear as a quantitative or a qualitative change in the way information is processed, can be explained by an increase of available cognitive resources. It is known that capacity and speed of operation of the working memory increase greatly during childhood and adolescence. Some cognitive factors that have been proposed to be involved in this increase include a gradually more efficient execution of cognitive routines (e.g., encoding of information), the use of more effective strategies (e.g., selective attention), and better developed knowledge structures (e.g., expert-like rather than novice-like knowledge structures), which allow for an easier integration of new content knowledge. These factors are believed to result in the release of cognitive resources, which are then again available to extract more regularities and rules from the environment, which, in turn, by being applied release more cognitive resources (Siegler et al., 2006). Noteworthy for the present discussion, Siegler (e.g., 1981), who developed the *rule-assessment approach* to the study of cognitive development, wrote that the assumption underlying his approach was “that cognitive development can be characterized in large part as the acquisition of increasingly powerful rules for solving problems” (p. 3).

In this framework, a straightforward answer to the question of what changes between the preschool years and second-grade concerning the situational correction operation would rest on the availability of cognitive resources. The correction operation within the three-stage model of person perception can be defined as the adjustment of a previous inference by the consideration of alternative causes of the behaviour. This definition implies that several pieces of information (i.e., previous inference outcome, behavioural information, alternative causes) have to be considered simultaneously in the working memory, which would exactly be the reason why cognitive-load manipulations affect this operation. Considering that preschoolers have a substantially lower working memory capacity and processing speed, it is plausible to reason that they do not have enough available cognitive resources to process the

several pieces of information jointly. Moreover, it is reasonable to expect that as preschoolers progress through development (and maybe become increasingly proficient at behavioural categorization and dispositional characterization), they will be able to extract a more “powerful rule for solving [person perception] problems” (Siegler, 1981, p. 3), namely the discounting principle, rendering second-graders already capable of using it in their judgements.

As said before, information processing theories of cognitive development were chosen to sustain speculations about the developmental mechanisms involved in the ontogenetic onset of the use of the correction operation, because they do not need added assumptions to provide a steady ground for such speculations. Nevertheless, other types of theories, such as Piaget’s theory of cognitive development (e.g., Lourenço, 1997), offer other strong possibilities for developmental variables and mechanisms (e.g., coordination of affirmations and negations) eventually involved in the age-related changes in the use of the situational correction operation.

As for suggested future studies, if the desired illustration was successful, a substantial set of dual-process models would offer themselves as good candidates for an ontogenetic test (e.g., the *Spinozan model of belief* by Gilbert, 1991; the *continuum model of impression formation* by Fiske & Neuberg, 1990; the *dissociative model of stereotyping* by Devine, 1989). The specific assumptions of each model would require attentive consideration (e.g., in the Devine’s model (1989) very young children may still have not developed the knowledge of a stereotype that will be the basis for automatic activation in the future), but an adequate ontogenetic test would, as argued before, offer the model the possibility of gaining extended validity or directions for adjustments. If the present illustration, on the other hand, may still be considered insufficient, further tests of the three-stage model of person perception could be devised, this time focusing, for example, on situational characterization and dispositional correction (inspired by Krull, 1993).

Other suggestions that follow logically from the presented studies would be to deepen the study of the relations between dispositional inferences derived from prior expectancies or from observed behaviour. In order to establish whether young children’s performances are indeed analogue to adults’ under cognitive-load performances, it would be useful to study cognitively-loaded adults in a paradigm similar to Study 3 (or to a simplified version of Jones et al., 1971). Another interesting direction would be to test with children whether dispositional prior expectancies have a constraining impact in behavioural categorization, whether both types of inferences occur independently from each other, being combined

afterwards in the dispositional characterization operation, or whether one type of inference is used in a corrective manner to adjust the other.

Ideas for studies like the ones mentioned in the last paragraph already drift somewhat away from the *theory-to-data* line of research. Instead, they point at the potentialities of conducting studies with children with the main goal of having a more transparent perspective over automatic processing, which may persist in adult functioning. The next part of this research project is devoted to a *data-to-theory* approach to studies in close, but not identical, areas of person perception, namely impression formation and person memory.

PART II: DATA-TO-THEORY

*Children are unpredictable.
You never know what inconsistency they're going to catch you in next.*

Franklin P. Jones

You are at a dinner party chatting with someone you just met. She is a librarian and during the dinner she recited some poem verses by heart. The thing is that you noticed that she preferred beer to a good wine and when she says “Oh, money spent on education is just a waste!” you get a bit puzzled.

As explained in the general introduction of this dissertation [*SEE CHAPTER 1*], the *data-to-theory* part of the research project aims at illustrating how children’s performances can provide insights that may later be used to raise sustained hypotheses about automatic processing of social information in adults. The chosen topic for accomplishing this goal was incongruency in impression formation settings (as when you have to figure out what kind of person an uncultured librarian might be). Two main reasons underlie the choice of this topic:

- (1) Incongruency has been extensively researched in the social cognitive literature due, at least in part, to its important role in rendering more visible the processes by which an organised and coherent mental representation of somebody is attained. Therefore, studying (children’s) cognitive responses to incongruency is not only interesting by itself, but has implications for how impression formation and person memory processes are modelled;
- (2) The processing of incongruent information that is executed more deliberately and with more cognitive effort is better known than the processing that occurs at the more automatic level when the perceiver encounters incongruent information [*FOR EXCEPTIONS SEE SECTIONS 3.2.4 AND 3.2.5*]. Children’s responses to this type of stimuli may provide an interesting model for adults’ more automatic responses, considering the ontogenetic prediction outlined in the opening chapter of this dissertation [*SECTION 1.3.2*].

The aim of the first part of the present chapter [*SECTION 3.2*] is to provide the reader with a sense of how the study of the processing of incongruent information is important for the fields of impression formation and person memory, both in terms of the identification of incongruency-related effects and the theorising of the structure and processes related to the mental representation of people. Developmental findings relevant for the present purposes will also be briefly reviewed. Next, four studies designed to explore children’s and adolescents’ responses to incongruent information in impression formation settings will be presented [*SECTION 3.3*]. In the first study the responses of differently-aged participants to

targets described either by evaluatively congruent or incongruent behaviours were collected. In the second and third studies the targets were described by descriptively congruent or incongruent behaviours and by congruent or incongruent pairs of traits. Finally, in the fourth study, the memory of differently-aged participants for expectancy-congruent and incongruent behaviours was tested. Closing the chapter [SECTION 3.4], some speculative notes, derived from the results of this set of studies, about the automatic processing of incongruent information will be discussed and some future research possibilities will be suggested.

As mentioned in the preceding section, the study of the processing of incongruent information in impression formation, besides being interesting by itself, acquires a special value derived from the social perceivers' assumption that a person's character is unitary and, as such, information concerning the person must form a comprehensible whole. Congruent information about the person, almost by definition, results in this coherent whole easily. Hence, in a rough metaphor, incongruent information in person perception and person memory may be used as molecular markers are used in microbiology, in this case to render the processing and structure of the mental representations involved in impression formation more visible.

The present framework section will first address key findings in the literature on the coherent nature of mental representations of people [SECTION 3.2.1], and later focus on the study of incongruency. Concerning incongruency, some major findings will be reviewed, including the incongruency effect in person memory [SECTION 3.2.2] and the resolution of incongruency in impression formation settings [SECTION 3.2.3]. The role played by these findings in the development of person memory models will also be highlighted [SECTION 3.2.2.C]. Towards the end of the framework section, some studies and considerations concerning the more automatic and less complex processing of incongruent information [SECTIONS 3.2.4 AND 3.2.5], as well as some relevant developmental evidence and theorising [SECTION 3.2.6], will be discussed.

Throughout the present chapter, the term incongruency will be used to refer generally to all instances of incongruity. Nevertheless, it is imperative to acknowledge that there are different kinds of incongruency, and that the cognitive processing triggered by or devoted to each kind of incongruency may differ as well. For example, incongruency may come in the form of inconsistent information about someone (e.g., she recited poems and downplayed the importance of education) or of expectancy-incongruent information (e.g., the librarian didn't know where Paris was, when you expected her to be cultured). Incongruency may also be primarily evaluative, involving positive and negative attributes (e.g., she is tactful and rude), or primarily descriptive, involving attributes with opposite meanings (e.g., she is tactful and frontal). Moreover, the type of incoming incongruent information may vary markedly. The majority of the studies described in the following sections focused either on traits (e.g., cultured and ignorant), behaviours (e.g., didn't know who Mozart was and bought season tickets to the ballet), or both (e.g., the trait as expectancy and the behaviours as incoming

information). One can anticipate that these types of information are hardly interchangeable, in the sense that, for example, the social perceiver may not infer the trait corresponding to a behaviour, thus avoiding blatant incongruency, but will not have such an alternative when the information comes in the form of traits. In a similar vein, the findings drawn from expectancy-incongruent material may not apply to inconsistent material, or results with evaluative incongruency may not replicate with descriptive incongruency. Therefore, although using a general term, a particular care throughout the text was devoted to provide the reader with sufficient information about the type of incongruency at focus in any given study.⁷⁸

3.2.1. CONGRUENCY IN PERSONALITY IMPRESSIONS

The idea that a person is a unit and is perceived as a unit may seem too straightforward, but it is what renders particularly intriguing how the social perceiver moves from the inference of someone's multiple dispositions (e.g., cultured, quiet, fun) to their integration in a unified mental representation (e.g., how that specific librarian seating next to you is like).

In the social world there are other types of units, like groups for example, about which the social perceiver may also entertain a unified representation (i.e., stereotypes). However, such units' representations typically tolerate sub-divisions (e.g., subtyping and subgrouping) and, hence, higher levels of concomitant inconsistency (e.g., there are quiet librarians and a minority of fun librarians). The coexistence of multiple and even partially opposing characteristics does not usually constitute a substantial problem for these kinds of representations.

Impressions of personality, on the other hand, with few exceptions (e.g., maybe the librarian suffers from dissociative identity disorder), have a stronger pull towards wholeness. In spite of the multitude of characteristics that can be attributed to an individual social target, the perceiver will in most cases easily attain a coherent impression, where the different characteristics will be intertwined in a such a way as to create a comprehensible whole (e.g., the cultured and quiet librarian is really fun due to her exquisite sense of humour), and predict other characteristics, usually congruent ones (e.g., intelligent).

⁷⁸ The same considerations generally apply to congruency.

3.2.1.A) WHOLENESS AND COHERENCE

The holistic principle summarized by Aristotle (trans. 2005) in the renowned phrase “the whole is something beside the parts” (Book VIII) was extended by early visual perception gestalt psychologists and thoroughly applied to the study of impression formation by one of their followers, namely Asch. It would be virtually impossible to write a theoretical framework on impression formation without referencing Asch’s studies (1946). There are so many relevant aspects of these studies to discuss, among their impact on methodological and theoretical paradigm shift (e.g., Garcia-Marques & Garcia-Marques, 2005; Gilbert, 1998a) and their results, that it proves quite hard to select just a few aspects. For the present purposes, though, the exposition will focus on how Asch’s studies (1946) illustrate the idea that an impression of personality is something fundamentally unitary, strongly coherent, and indivisible, or something beside the traits (parts) that originated it.

Asch’s ten influential studies (1946) shared a common procedure, in which participants listened to a list of personality traits (read at a slow pace), imagined a person who could be characterized by all those traits, and produced a brief written paragraph about that person. One of the author’s preliminary and general comments on the collected data was that these short paragraphs did not consist of a repetition of the given traits, neither of their synonyms, nor even of discrete elaborations on the given terms. Rather, “the separate qualities [were shaped] into a single, consistent view” (p. 261).

More direct evidence favouring the holistic and integrative (in opposition to a more linear or additive) view of the impression formation process comes from the celebrated warm-cold study (Asch, 1946 – Study 1). In this study, a group of participants heard the following seven traits: *intelligent, skilful, industrious, warm, determined, practical, cautious*. Another group heard the same list with one exception, namely the trait *warm* was replaced by *cold*. The manipulation produced not only a striking qualitative effect in the impression paragraphs, it also produced notable differences in the choice frequency of other attributes listed in a check list (e.g., *generous*) as fitting the personality impression of the target person.⁷⁹ The radical impact of the manipulation of a single trait (one of seven parts) on the personality impression (the whole) of the imagined target supports the idea that integrative forces act upon the traits to give them the coherence characteristic of something that is unitary, and

⁷⁹ This is informally known as the warm-cold effect.

opposes the idea that traits are merely combined. Moreover, the choice frequency of some other traits from the check list (e.g., *honest*) did not vary according to the condition, rendering the supposition that the effect might have been produced merely by a more positive or negative evaluation of the target improbable.

In the same paper Asch (1946) tried to identify some of the processes by which the coherence of a personality impression might be attained. In one of the studies (Study 5) the author examined directly the idea that trait terms acquire and/or change their content as a function of the context of other trait terms that are used to describe the same person. In this study, a group of participants heard the list *kind, wise, honest, calm, strong*, and another group heard the list *cruel, shrewd, unscrupulous, calm, strong*. In both conditions participants were asked to describe the target, this time not by producing narrative paragraphs, but other adjectives that were not present in the stimulus list. The analysis of the synonyms produced for the last two traits, which were common to both lists, revealed that there were a considerable number of connotations that would emerge in the context of one list, but not the other (e.g., *calm* as *gentle* vs. *calculating*, and *strong* as *courageous* vs. *hard*). Forming an impression seems thus to imply, at least in part, that the social perceiver will shape the incoming information towards its congruency with the previously acquired information.

Finally, another Asch's study (1946 – Study 8) illustrates again quite well both the indivisible nature of a personality impression and the shaping of individual characteristics towards congruency. In this study, half of the participants were required to write an impression of a target described by the traits *intelligent, industrious, and impulsive*, another impression of a *critical, stubborn, and envious* target, and finally an impression of someone who could be characterized by the six preceding traits. The majority of these participants reported (a) a considerable difficulty in imagining someone who would possess all six traits, (b) that they had to form a new impression (rather than combining the two previous impressions), and (c) that in this new impression many of the traits acquired a different meaning in order to achieve coherence (e.g., *impulsive* as *imaginative* in the short list turned into *hasty* in the long list). The task of the other half of the participants, on the other hand, was simply to imagine a target that could be described by the six traits (i.e., the third task of the other group of participants). In sharp contrast to the other condition, these participants reported having little difficulty in forming an impression of the target.

The studies briefly presented in this section support the idea that the processes underlying impression formation are more complex than a kind of trait bookkeeping or an additive combination of a target's dispositions. In spite of this complexity, the social

perceiver seems to construct mental representations of the others very easily and markedly in the direction of congruency. Asch's studies (1946) illustrate compellingly how the social perceiver moves towards congruency in his/her impressions of others both by (1) intertwining the traits in such a way that their relations become understandable (whether by using a narrative that explicates these relations, as in the personality sketches, or by shaping the content of some traits to achieve a better evaluative match, as in the synonyms task), and by (2) adding or predicting congruent characteristics (as in the check list task). However, in this foundational paper it does not become clear what enables participants to go beyond the given information in non-arbitrary ways (e.g., in a considerable number of cases the participants' consensus in the choice of a fitting trait would be as high as 90% or even 100%).

3.2.1.B) IMPLICIT THEORIES OF PERSONALITY

One can say that what enables the social perceiver to move non-arbitrarily beyond the given information are his/her beliefs about which personality traits tend to co-occur within a person and which are rarely found in conjunction in someone's character (e.g., believing that usually cultured people are also intelligent will enable you to assume that your newly acquainted librarian, who recited poems, is also an intelligent person). These sets of beliefs have been designated in the literature as the social perceiver's *implicit personality theory* (Bruner & Tagiuri, 1954; Cronbach, 1955). In a sense, it is exactly the implicit theory of personality held by the social perceiver that determines whether a trait is considered to be congruent with another trait, with a general impression, and/or with an expectancy, or whether it is considered to be incongruent.

One of the first implicit beliefs about personality to be identified is known as the *halo effect* (Thorndike, 1920) and can be thought of as "the simplest implicit personality theory" (Brown, 1986, p. 389). The social perceiver not only tends to predict that a person will have attributes evaluatively congruent with other perceived attributes (e.g., Bruner, Shapiro, & Tagiuri, 1958; Osgood, 1962), and tends to interpret the meaning of perceived attributes in a way that is evaluatively congruent with a general impression (e.g., Asch, 1946), but also will his/her "global evaluations alter evaluations of attributes about which the individual has information fully sufficient to allow for an independent assessment" (Nisbett & Wilson, 1977, p. 255). This implicit theory of personality held by social perceivers basically makes one tend to perceive a cultured librarian as also being smart, elegant, and generally a nice person. As

Brown (1986) points out, the pervasive and rather subtle presence of this implicit personality theory can be spotted in the linguistic use of the conjunctions *but* and *and*: the librarian you just met is cultured *and* smart, *but* rather cold.

However, even if “the most general factor is always evaluation” (Osgood, 1962, p. 25) in personality semantics, it does not seem to be the case that evaluative congruency is the only important implicit theory of personality. Going back to the warm-cold effect (Asch, 1946 – Study 1) discussed in the previous section, it is obvious that the *warm* target was imagined very positively overall, but the *cold* target was not imagined more negatively overall, just in some traits. These results indicate that the application of the evaluative congruency implicit theory has some spontaneous limits. Peabody (1967) for example, whose research will be discussed in more detail later [SECTION 3.2.3], identified one such limit for the application of the evaluative congruency implicit theory, namely descriptive congruency (i.e., congruency in semantic meaning). When pitted directly against each other, social perceivers prefer to maintain descriptive congruency over evaluative congruency (e.g., infer that a *bold* person is more *rash* than *cautious*).

A more accurate description of a broad implicit personality theory detained by social perceivers was accomplished by Rosenberg, Nelson, and Vivekananthan (1968). The authors asked participants to group a set of trait labels according to how they believed those traits could be found in different persons’ characters. Thus participants basically grouped the given traits so that traits within the same category were believed to co-occur naturally, while traits in different categories were believed not to co-occur, at least in the personalities of the people participants had in mind. The authors then subjected the obtained data to a multidimensional scaling approach, which allows for the reduction of the data into underlying dimensions. With Rosenberg and collaborators’ data, the adjustment to a bi-dimensional representation of the data was particularly interesting. Not only was the distortion level between data and representation acceptable (which means that only a rather small amount of information was lost), but a substantial meaning could be readily assigned to the two identified dimensions. The authors defined one of those dimensions as reflecting a social desirability property (i.e., with socially good and bad attributes, like *tolerant* and *unpopular*, ranking high and low along this dimension, respectively), and the other as denoting an intellectual desirability property (i.e., the same for intellectually good and bad attributes, like *determined* and *foolish*). Another noteworthy finding was that the two dimensions are not orthogonal. Rather, the two positive and the two negative poles are closer to each other than otherwise, which is very consistent with the existence of the previously discussed evaluative congruency implicit theory. In other

words, a position relative to these social and intellectual dimensions could be assigned to every trait and in its surroundings one could find evaluatively and descriptively congruent traits.

The multidimensional approach to the structure of personality impressions (Rosenberg et al., 1968) suggested new ways of conceptualizing how these impressions are attained. It can be thought that the social perceiver, while acquiring information about another person, is trying to situate the target in a multidimensional space, defined by the social and intellectual dimensions.⁸⁰ As such, information saturated in one or both of these dimensions will have a greater impact in the final impression. Once the target is situated, the social perceiver can also easily infer other traits, simply by considering the surroundings of the target's location. Rosenberg and collaborators (1968) reinterpreted Asch's warm-cold effect (1946) accordingly. The idea is that the six traits that are held constant both in the warm and cold conditions (e.g., *industrious*) are informative solely of the intellectual dimension, thus placing the target near the positive end of that dimension, but in uncertain location relative to the social dimension. The only traits in the list that can help the social perceiver to unambiguously situate the target are exactly the manipulated traits, with *warm* placing the target in the positive social quadrant and *cold* in the negative. This reinterpretation accounts not only for the marked differences observed in the impression formed under both conditions, but also for the selective impact of the manipulation in the other trait inferences (i.e., traits in the checklist).

The main point for the present purposes is that the study of the implicit theories of personality clarified why the social perceiver can easily infer a considerable amount of information about someone's personality, based on minimal input. This information is also mainly congruent, in the sense that the representations that allow for the inferences are the same that define traits as congruent or incongruent.

3.2.1.C) ORGANISATION IN MEMORY

The studies discussed in the previous sections support the claim that social perceivers conceive of persons as natural units and therefore strive to form a complete and coherent impression of each person, namely by calling upon their implicit theories of personality. In

⁸⁰ Similar content dimensions (e.g., *warmth* and *competence*) have been theorized to be central aspects both of interpersonal and intergroup perception (e.g., Fiske, Cuddy, & Glick, 2007).

the present section convergent evidence coming from the person memory literature will be discussed.

Regarding the unitary character of personality impressions, studies by Ostrom and Pryor and other collaborators (e.g., Pryor & Ostrom, 1981) questioned the assumption that the social perceiver would organise the incoming information in memory by target-persons in settings where the information referred to multiple and unfamiliar targets (e.g., a dinner party where you would not know many of the guests) . In their studies there seemed to emerge a preference for participants to organise information in terms of other descriptor categories (e.g., while telling someone about yesterday's dinner party you could report first the occupations of the different guests, then their hobbies, etc.). A meta-analysis, performed by Sedikides and Ostrom (1988) on a total of 44 studies of this type,⁸¹ however, allowed concluding that even in multiple and unfamiliar target settings social perceivers tend to use a person-based organisation (i.e., to aggregate information that refers to the same person). Brown (1986) suggests that this tendency increases with familiarity of the targets and with the social perceivers' goal to form impressions or to evaluate the targets.

Concerning the cohesion of personality impressions, a set of studies conducted by Hamilton, Katz, and Leirer (1980) obtained a quite ironic result, which has been amply replicated in the literature (e.g., Costa, 2009; Srull, Lichtenstein, & Rothbart, 1985). In these three studies, participants were presented with some sentences, at a slow pace, each describing a common behaviour (e.g., took his dog for a walk in the park).⁸² After a filler task, participants were asked to recall the behaviours they had read previously. The focal manipulation was that while half of the participants had known from the beginning that their memory would be tested and were asked to memorize the information, the other half of the participants was not anticipating a memory test and had been instructed to form an impression of the actor who purportedly performed all the behaviours. Paradoxically, the participants who were trying to memorize the information recalled fewer behaviours than the participants who were merely trying to form an impression. The authors took this finding as an indication that a personality impression is a more cohesive and integrated mental representation than other sorts of representations that may arise from the exact same information but under a different processing goal.

⁸¹ Curiously 43 studies out of the 44 studies were performed either in Ostrom's or Pryor's laboratories.

⁸² In some of the conditions a *distinctive* behaviour was included in the set (e.g., lost his temper and hit a neighbor he was arguing with). This variable and the results it produced, however, are not relevant for the present purposes.

THE CONGRUENCE OF PERSONALITY IMPRESSIONS

One may find it somehow curious that a person, having a multiplicity and diversity of attributes, is perceived as a unit, an indivisible and coherent whole. This consideration is even more surprising, though, when these attributes clash with each other. In Asch's studies (1946), for example, participants had to make sense of a set of different and non-redundant traits, but usually these traits were not in strong opposition to each other. Asch clarified that the traits were selected using "an informal sense of what was fitting or relevant" (p. 262). The following sections of this theoretical framework exposition will focus on what typically happens when the traits, given or implied, are non-fitting or incongruent with previously given information about the target-person.

3.2.2. REMEMBERING INCONGRUENT INFORMATION

It is both common sense knowledge and an empirical finding that first impressions, or impressions formed upon early information, bear more weight than subsequent information in the final impression and are quite resistant to change (e.g., Asch, 1946; Garcia-Marques & Hamilton, 1996). From this perspective one could expect that having initially formed the impression that the librarian seating next to you is a cultured person (an inference drawn from her occupational stereotype and from her behaviour, namely poem recitation), you would neglect her unpolished taste for drinks and unrefined views about education. Person memory studies, however, offer another perspective, which will be briefly reviewed in the next sections.

3.2.2.A) INCONGRUENCY EFFECT

One robust finding in the person memory literature, directly involving incongruent information in an impression formation context, was first obtained by Hastie and Kumar (1979). The authors conducted three studies sharing a common paradigm. First, participants formed an impression of a target-person based on some highly congruent traits (e.g., *intelligent, clever, bright*), and then read a set of behaviours allegedly performed by that

person. These behaviours could be congruent with the formed impression (e.g., won the chess tournament), incongruent (e.g., made the same mistake three times), or simply irrelevant (e.g., took the elevator to the third floor). The major differences between studies involved the proportion of expectancy-congruent and incongruent behaviours in each set and the serial position that each behaviour occupied in its set.

In all three studies, behaviours that were incongruent with the first impression formed by the participants were better recalled than both congruent and irrelevant behaviours. This phenomenon has been designated in the literature as the *incongruency effect*. The results of Hastie and Kumar's studies (1979) demonstrate that the personality impression that social perceivers may have formed about someone affects the way subsequent information about that person will be processed (i.e., encoded, stored, and/or retrieved). The most obvious evidence of this impact is the fact that the exact same behaviour (e.g., made the same mistake three times) was better recalled when the target-person had been described in a particular way (e.g., as intelligent) than in another (e.g., as unintelligent). However, these results are not surprising from this perspective, since many memory studies had already established that the recall of particular information is influenced by the more general theme it relates to (cf. Hastie & Kumar, 1979). The incongruency effect is surprising precisely because amidst a "considerable literature that portrays human beings as incongruence avoiders or, at least, as incongruence neglecters" (Garcia-Marques, 1993, p. 11), congruent behaviours were expected to have the mnemonic advantage.

Another feature that renders the incongruency effect surprising is that it is not reducible to the Von Restorff effect identified in the memory literature (i.e., a distinctive or isolated item in a list will be more likely remembered than a non-distinctive item in an identical list). In fact, in two of the studies by Hastie and Kumar (1979 – Studies 2 and 3) some of the lists contained as many expectancy-incongruent as congruent items, but the incongruent items were still better recalled. A more extreme demonstration was accomplished by Srull (1981 – Studies 1 and 3), who included lists that contained more expectancy-incongruent than congruent items, and still obtained the incongruency effect.

3.2.2.B) CONDITIONS FOR THE OCCURRENCE OF THE INCONGRUENCY EFFECT

Although the incongruency effect can be robustly obtained in person memory studies, Hastie and Kumar (1979) were the firsts to note that it possibly occurs only when specific

conditions are met (e.g., when participants have an impression formation goal, enough time to think, and/or the memory test is a free-recall task). Later on, with the accumulation of studies that addressed the way social expectancies influence the processing of congruent and incongruent incoming information, the conditions for the occurrence of the incongruency effect could be better distilled, namely through meta-analytical procedures (e.g., Stangor & McMillan, 1992).

To start with, the incongruency effect is expressly a memory, and not an impression judgement, effect. In other words, the social perceiver may recall better behavioural information that is incongruent with a previously formed impression about someone and, simultaneously, still judge that person's personality to be congruent with the prior impression (e.g., Garcia-Marques, 1993; Garcia-Marques & Hamilton, 1996). However, the incongruency effect is not a general memory effect either, since it is more likely to emerge in recall paradigms than in recognition paradigms. This dissociation may occur because participants in recognition paradigms can more easily use guessing strategies, which in turn tend to conform to prior impressions or expectancies. This hypothesis was corroborated by Stangor and McMillan's meta-analysis (1992), which concluded that incongruent information has a mnemonic advantage in free-recall and recognition sensitivity measures, but a disadvantage in recognition measures that are uncorrected for biases. Free-recall and recognition also rely in different retrieval strategies, which can result in opposite findings (e.g., Garcia-Marques & Hamilton, 1996). Another memory measure, namely the estimate of the amount of previously presented congruent and incongruent behaviours, does not yield the incongruency effect either. On the contrary, this measure usually reveals a bias towards congruency, designated as *expectancy-based illusory correlations* (Hamilton & Rose, 1980).

The incongruency effect also seems to depend a lot on the amount of pressure imposed on the cognitive system to form a coherent whole, which is characteristic of personality impressions as discussed earlier [SEE SECTION 3.2.1]. When the social perceiver, for example, has the explicit goal of forming an impression of a target-person, incongruent behaviours will have a higher probability of being recalled, than when the processing goal is to merely memorize the same set of behaviours (Srull, 1981). Moreover, expectancy-incongruent information about an individual target is also more memorable than expectancy-incongruent information about members of a group (Stangor & McMillan, 1992).

Furthermore, it seems to be the case that social information becomes more memorable when it is blatantly incongruent (i.e., when it is both evaluatively and descriptively incongruent), and when the social perceiver has enough available cognitive resources to try to

resolve the incongruity. Whenever the task of forming impressions is made too complex (e.g., by asking participants to simultaneously form impressions of several targets, or by increasing the number of traits at play), or the time to process the incoming information is reduced, the incongruity effect tends to disappear (Stangor & McMillan, 1992). A stronger test of the idea that the incongruity effect depends on the activity of an executive cognitive process (for resolving incongruity), and not just on the unspecified amount of available cognitive resources, was performed by Macrae, Bodenhausen, Schloerscheidt, and Milne (1999). The authors conducted two studies in which participants' cognitive resources were depleted by performing a concurrent task that would either affect executive function (i.e., random generation of digits every half or whole second), or not affect executive functioning (i.e., repeating the same word every half or whole second). Simultaneously participants were trying to form impressions of two targets. As predicted, the incongruity effect was eliminated in the condition where participants' executive functioning was recruited by the concurrent task, but not in the other condition.

The favourable conditions for the emergence of the incongruity effect seem then to indicate that it depends on the momentary ability of the social perceiver to process social information in rather complex and resource demanding ways. From this perspective, one would not expect to find the incongruity effect when the social perceivers are young children. This question will be addressed in a subsequent section dedicated to developmental person memory studies [SEE SECTION 3.2.6.B].

3.2.2.C) PERSON MEMORY MODEL AND THE TRAP MODEL

More than being a robust effect in person memory literature, the finding of the incongruity effect was very consequential for the development of highly specific models in detailing the processes involved in impression formation and the resulting cognitive representation of that impression. The first steps towards the formulation of the *person memory model* were given by Hastie and Kumar (1979), alongside the identification of the incongruity effect [SEE SECTION 3.2.2.A]. The authors suggested a hybrid model that incorporated ideas already extensively elaborated in the cognitive literature, namely components of the depth-of-processing model (Craik & Lockhart, 1972) for the encoding phase of the social information, and components of the human associative memory theory (Anderson & Bower, 1973) for the representation structure and retrieval rules. Subsequently

Hastie (e.g., 1980), Srull (e.g., 1981), and collaborators (e.g., Srull & Wyer, 1989) developed, further specified, and empirically tested the Hastie-Srull person memory model.

Basically this model proposes that, while the social perceiver is forming an impression, information referring to the same target-person will be stored in an associative network in episodic memory. The entry point of the network is a node with identifying information about the person (e.g., the librarian at the dinner party). Other nodes of the network will be formed and linked to the person-node each time the social perceiver encounters an instance of behavioural information (e.g., she wore a blue coat). Usually some expectancy will be elicited by the target (e.g., if she's a librarian, she must be cultured), and this expectancy will determine the way incoming information is processed. When the social perceiver encounters an expectancy-congruent behaviour (e.g., recited some poem verses by heart, the association with the person-node will be easily established, forming a link between nodes. When the behaviour is irrelevant concerning the expectancy (e.g., wore a blue coat), a single link between the person-node and the behaviour-node will be formed, too. However, when the perceived behaviour is expectancy-incongruent (e.g., said money spent on education is just a waste), the model suggests that the social perceiver will try to reconcile it with the prevailing impression (e.g., of a cultured person). In order to do so, the incongruent behaviour will be held longer in working memory, while the social perceiver retrieves relevant information from long-term memory, and will form additional links with this other information (i.e., will be processed *deeper* than congruent or irrelevant information). For example, the social perceiver might remember that the librarian also preferred beer to a good wine (i.e., another expectancy-incongruent behaviour), and that she knows the geographical location of most countries (i.e., an expectancy-congruent behaviour). The social perceiver might then intertwine these three pieces of information, concluding that when the librarian downplays the importance of education, she may be under the influence of alcohol, being sarcastic, or trying to advocate the importance of direct experience over formal education. Thus, according to the person memory model, expectancy-incongruent behaviours form, at encoding, more inter-item links (i.e., with congruent and other incongruent items) than any other type of information.

The second part of the incongruity effect explanation by the person memory model derives from its retrieval assumptions. The model postulates that the social perceiver initiates the memory search (as demanded by a free-recall task) by traversing a link that originates in the person-node. After that, the social perceiver will preferably follow inter-item links, in his/her quest for yet unreported behavioural items. Because the expectancy-incongruent items

are the most densely associated items in the network, they will have the higher probability of being recalled, and the incongruity effect will emerge.

The person memory model has received an impressive amount of corroborating evidence, both in its most general and also specific assumptions, as for example recall sequences or inter-item latencies of recall (see e.g., Garcia-Marques & Garcia-Marques, 2005). However, one of the omissions of the person memory model was that it did not allow understanding how the incongruity effect in recall could be reconciled with other memory and judgement findings showing that the social perceiver was biased towards congruency (e.g., the expectancy-based illusory correlations mentioned in the previous section). The *twofold retrieval by associative pathways* (TRAP) model, proposed by Garcia-Marques and Hamilton (1996), builds on the assumptions of the person memory model, but distinguishes between an exhaustive (non-selective) and a heuristic (selective) mode of retrieval. The exhaustive mode, which would operate in free-recall tasks, since the social perceiver is trying to report all behavioural instances, is assumed to function as described earlier by the person memory model. On the other hand, the heuristic mode, which would operate in frequency-estimation tasks, for example, where the social perceiver is trying to report how many behavioural instances of a certain type are represented in memory, is assumed to follow the availability heuristic (Tversky & Kahneman, 1973). In the case, for example, that the social perceiver is trying to estimate the number of expectancy-incongruent (e.g., uncultured) behaviours performed by the target-person (e.g., the librarian), this estimate will depend on the ease of retrieval of a relevant item. Because incongruent items countered the expectancy at encoding, they were weakly associated with the target-node, although densely associated with other behavioural items. Hence, the ease of retrieval, when proceeding from the target-node, is rather low for expectancy-incongruent instances (e.g., generating less instances per given unit of time), and the total amount of incongruent items will be underestimated. The TRAP model was extensively tested (Garcia-Marques, 1993; Garcia-Marques & Hamilton, 1996; Garcia-Marques, Hamilton, & Maddox, 2002) and remarkably, in those studies, the same participants, using the same informational bases, recalled more expectancy-incongruent behaviours while underestimating their frequency and while maintaining impressions rather expectancy-congruent.

In the context of the present research project, it should be noted that although the person memory model and the TRAP model provide an excellent adjustment to adult data in impression formation and person memory studies, little is known about the ontogeny of the processes that they model. A set of studies with children that have focused on person memory

will be reviewed further down [SEE SECTION 3.2.6.B]. However, consonantly with what is being argued in the present dissertation, a more direct investigation of these models' ontogeny would not only increase knowledge about child person perception, but could also provide valuable insights about more automatic and efficient adult person perception.

REMEMBERING INCONGRUENT INFORMATION

The research reviewed in this section illustrates the empirical and theoretical relevance of the study of incongruent information in impression formation contexts. This research allowed identifying and delimitating a curious phenomenon – the incongruency effect – which in turn impelled the building of well-specified and sophisticated models of person cognitive representation (i.e., the Hastie-Srull person memory model and the TRAP model). Noticeably, although these models are fully applicable to instances when the social perceiver is confronted exclusively with expectancy-congruent or irrelevant information about a target-person, it is hard to conceive how such a degree of specification would have been possible, had it not been the study of expectancy-incongruent information.

The person memory studies using expectancy-incongruent information have also provided valuable cues to how the social perceivers process this kind of information, namely by holding expectancy-incongruent items longer in the working memory, processing them more extensively, and thus creating more inter-item associations. However, this description leaves open how the social perceiver psychologically makes sense of incongruent information in impression formation contexts. This question will be addressed in the next section.

3.2.3. MAKING SENSE OF INCONGRUENT INFORMATION

A cultured librarian with dubious tastes and opinions, who, moreover, has been described by others as quiet and fun, does not represent an insoluble problem to the social perceiver. On the contrary, a certain level of perceived inconsistencies can render the target-person quite interesting to the social perceiver's eyes, who has a range of strategies at his/her service to make sense out of incongruent information.

The next two sections will focus on research conducted with traits as stimuli and in which the incongruency came in the form of the inconsistency between the meaning and/or

connotation of two or more traits. This type of incongruity is, however, essentially different from the behavioural incongruity towards an expectancy that was addressed in the previous sections. In other words, it may well be the case that when the social perceiver encounters an ignorance-implying behaviour performed by a librarian, s/he will not perceive it as ignorant. In such a case, the social perceiver will not need to make sense of inconsistent traits. The third section to follow [SEE SECTION 3.2.3.C] will resume the focus on the sense making of expectancy-incongruent behaviours.

3.2.3.A) CHANGE OF MEANING

One of the most straightforward methods that a social perceiver can use to adjust pieces of information that are seemingly incongruent with each other is to slightly modify the meaning of the incoming information. Asch (1946), as discussed previously [SEE SECTION 3.2.1.A], already singled out this possibility and offered some evidence to support it. For example, participants in Asch's studies thought of different connotations for the same input trait in order to make it evaluatively more congruent with the previously given traits (e.g., *impulsive* could be understood as *imaginative* or *rash*).

The idea that there may be a positive and a negative connotation for the same denotative personality trait was systematized by Peabody (1967). The author built a comprehensive system of traits, organising them whenever possible in sets of four, in which two of the terms were evaluatively incongruent with the other two (e.g., *impulsive* and *inhibited* vs. *self-controlled* and *uninhibited*), crossed with two terms being descriptively incongruent with the other two (e.g., *impulsive* and *uninhibited* vs. *inhibited* and *self-controlled*). In some cases it was not possible to form the complete set of four, but only a set of three (e.g., a positive connotation for *stupid* is missing), or two terms (e.g., both a positive connotation of *dishonest* and a negative connotation of *honest* are missing). Despite the fact that traits could not be exhaustively assigned to sets of four, that was possible for a considerable number of traits. Hence, Peabody's system helps to understand how social perceivers can easily achieve evaluative congruency in a personality impression of someone, without sacrificing descriptive congruency.⁸³

⁸³ However, as stated before [SEE SECTION 3.2.1.B], social perceivers do not usually sacrifice descriptive congruency in order to achieve evaluative congruency (e.g., an *impulsive* (negative attribute) person is predicted to be more likely *uninhibited* (positive attribute) than *inhibited* (negative attribute); Peabody, 1967).

Changing the meaning of a trait label (e.g., the librarian is fun in a *witty*, not *frivolous*, way), and inferring a certain trait label that adjusts better to an already formed impression (e.g., the librarian just made a *witty* remark), seem to be useful, and frequently used, tools to ensure the congruency of a personality impression. However, they seem to be insufficient when the social perceiver encounters instances involving traits that do not have an evaluatively congruent connotation or traits that convey descriptively incongruent information (e.g., it is hard to think of a good way to be *uncultured*). The way social perceivers deal with strongly (both evaluatively and descriptively) incongruent pairs of traits will be addressed in the next section.

3.2.3.B) MODES OF RESOLUTION

In a paper explicitly presented as an extension of Asch's pioneering studies (1946), Asch and Zukier (1984) again asked participants to imagine and describe a target-person who could be characterized by some given traits. The major difference in the present method was that the given traits would always come in pairs, which could consist of congruent (e.g., *intelligent* and *witty*) or incongruent traits (e.g., *brilliant* and *foolish*). Participants were also directly asked to explain how the two traits were related to each other in the target's personality.

One general comment on the participants' performances was that they proceeded with apparent ease and fluency, markedly so even when the traits were incongruent.⁸⁴ This observation suggested that the task of resolving incongruencies while forming impressions of others was not unprecedented for participants and, thus, not fully artificial.

Out of the participants' reports, the authors then identified six common modes of incongruency resolution:⁸⁵ (a) *segregation* – each trait was assigned to a different context or domain of applicability, although the two were supposed to interact constantly (e.g., *brilliant* and *foolish*); (b) *depth dimension* – one of the traits was assigned to the inner disposition of the person, while the other to the superficial manifestations (e.g., *lonely* and *sociable*); (c) *cause-effect* – one of the traits was considered to be a cause for the emergence of the other (e.g., *dependent* and *hostile*); (d) *common source* – both traits derived from an overarching

⁸⁴ In Asch and Zukier's study (1984) participants produced oral, rather than written, descriptions.

⁸⁵ A seventh mode of resolution was identified, but it occurred only within a congruent pair of traits (i.e., *enabling* - a trait, namely *intelligent*, was considered a necessary condition for the other, namely *witty*).

trait (e.g., *cheerful* and *gloomy* as manifestations of *moody*); (e) *means-end* – one of the traits was considered a medium to materialize the other (e.g., *strict* and *kind*); (f) *interpolation* – bridging information was introduced between the two traits (e.g., *intelligent* and *unambitious*). This last strategy was frequently used, also in conjunction with the other modes of resolution. In a rare number of cases, participants stated that they could not resolve the incongruity (e.g., *vindictive* and *generous*).

Hampson (1998) conducted a study with a similar task (Study 2), but where the type of incongruity between the traits was systematically manipulated using the aforementioned Peabody system [SEE SECTION 3.2.3.A]. As such, participants were asked to write down the impression they had formed about targets that were described by a pair of (a) evaluatively incongruent traits (e.g., *generous* and *extravagant*); (b) descriptively incongruent traits (e.g., *generous* and *thrifty*); or (c) evaluative and descriptively incongruent traits (e.g., *generous* and *stingy*). After this task participants rated the difficulty they had felt in forming the impression of the target person. From the participants' perspective the easiest incongruity to resolve was the evaluative one, and from two independent judges' perspective the descriptions provided for that type of incongruity were the most integrated (i.e., where incongruity resolution was more visible).

In the same paper, the author reports another study (Hampson, 1998 – Study 4) where participants were asked to select among eight modes of incongruity resolution the one that explained better why they had previously (i.e., one week before) assigned incongruent traits to describe a single target (see Hampson, 1998 – Study 1). A variant of Asch and Zukier's (1984) *segregation* mode of resolution (i.e., "different situations or circumstances can bring out different, even inconsistent, sides of people", Hampson, 1998, p. 114) was considered on average to be the most applicable explanation, followed by a *descriptive conflict* explanation ("sometimes it's hard to describe a person – it seems that both traits fit", p. 114). These results suggest that, although social perceivers seem to be able to resolve incongruities in truly integrated and complex ways, they often opt for more segregated solutions.

The results of both Asch and Zukier's study (1984) and Hampson's studies (1998) show that the social perceivers can resolve incongruity between traits, under an impression formation goal, quite proficiently and creatively. However, in these studies participants were directly asked to explicate the relation between the traits, and thus their performances are not informative of spontaneous strategies that the social perceiver may use when confronted with incongruent information. Moreover, the input material consisted of personality traits, which is useful to understand how traits, once they are abstracted, are integrated into a personality

impression, but is essentially different from understanding how the social perceiver makes sense of information that is conveyed by behaviours that are incongruent with a previously formed impression (e.g., when a cultured librarian downplays the importance of education). The following section addresses some of such complementary issues.

3.2.3.C) CAUSAL ATTRIBUTION

As discussed previously [SEE SECTION 3.2.2], Hastie and Kumar (1979) proposed that expectancy-incongruent behaviours are more memorable than congruent and irrelevant behaviours because the social perceiver processes the former type of behaviours more extensively in order to explain their occurrence. Some years later, using a similar experimental paradigm, Hastie (1984) tested two fundamental parts of this proposition, namely that under an impression formation goal (1) expectancy-incongruent, more than congruent, behaviours elicit attributional activity, and that (2) attributional activity enhances the recall probability of the correspondent item.⁸⁶

In Study 1, participants read a set of behaviours (in a proportion of two congruent behaviours to one incongruent behaviour), purportedly performed by a target-person, and formed an impression of that person. Next, participants freely wrote a brief continuation for all behaviours contained in the set (e.g., *given behaviour*: won the chess tournament; *participant's continuation*: because he had studied the game for five years). At the end of the procedure, which contained multiple sets of behaviours, participants were asked to recall the behaviours performed by each target-person. The continuations generated by the participants were coded as *explanations* (of why the behaviour was performed), *elaborations* (of the circumstances present when the behaviour was performed), or as *temporal successions* (of what happened after the behaviour was performed). The most frequent continuations overall were elaborations, but, as predicted, incongruent behaviours triggered explanations more often than congruent behaviours did. As to the recall measure, the incongruency effect was replicated, and although the correlation between explaining and recalling a behaviour was not very high, it still was statistically significant.

In Study 2, the type of continuation for each behaviour was not measured but manipulated, thus providing a stronger test of the assumption that it is the attributional

⁸⁶ Hastie (1984) narrowed the idea of “explaining the occurrence a behaviour” to its “causal attribution”, which is not surprising since causal attribution was a very popular topic at the time.

activity, which is devoted to a given behaviour, that enhances the memory for that behaviour. The paradigm was almost identical to the previous study, but this time participants were instructed about which of the three types of continuations they should write for each behaviour. The behaviours that were followed by a causal explanation were more often recalled (independently of being congruent or incongruent with the formed impression), supporting the idea that trying to explain a behaviour enhances its recall probability. However, the incongruity effect was still obtained (i.e., incongruent behaviours were better recalled with all kinds of continuation) indicating that the incongruity effect is not dependent on attributional activity as hypothesised by the author (Hastie, 1984).

Crocker, Hannah, and Weber (1983) also studied a question related to the incongruity effect and causal attributions. In one of the studies (Study 3), participants judged on two rating scales the extent to which they thought that a target behaviour (i.e., an incongruent item in the experimental condition or a congruent item in the control condition), which was embedded in a list of expectancy-congruent and irrelevant behaviours, had been caused by dispositional or situational factors. Participants rated the incongruent behaviour higher in the situational scale and the congruent behaviour higher in the dispositional scale. Hence, when explicitly asked to attribute a cause to an incongruent behaviour, after an impression is formed, social perceivers seem to prefer to attribute it to situational factors.

Summing up, social perceivers seem to be more likely to spontaneously engage in attributional activity when faced with expectancy-incongruent, rather than congruent, behaviours, which is consistent with the idea that the social perceivers are striving to attain a coherent personality impression of the target-person. However, Hastie's participants (1984) gave explanations only for less than half of the incongruent behaviours, implying that causal attribution is not the exclusive, nor axiomatic, way to process a behaviour that counters the social perceivers' impression of somebody. Furthermore, social perceivers seem to be more likely to attribute incongruent behaviours to situational forces, when explicitly questioned about the probable sources of the causes, which seems to be a sensible way of protecting the coherence of the previously formed impression.

MAKING SENSE OF INCONGRUENT INFORMATION

The studies discussed in the previous sections exemplarily show how proficiently and plausibly adult social perceivers can explain incongruent information about someone. Social

perceivers, while forming an impression, seem to avoid incongruency by picking the most adjustable connotations for trait labels (e.g., Asch, 1946; Peabody, 1967), seem to spontaneously look for plausible causes for incongruent behaviours (e.g., Hastie, 1984), and they also seem to be very fluent at explaining stronger forms of incongruency, namely when two incongruent traits are used to describe the same person (e.g., Asch & Zukier, 1984).

In the context of the present research project however, where children's and adolescents' responses to incongruency will be studied, it is relevant to note that all of the previously discussed ways of dealing with incongruency suggest again that a high level of sophistication, in terms of cognitive skills, is needed. For example, it is necessary that the social perceiver has access to a rather detailed and complex trait mental lexicon, in order to select the terms that fit a particular impression better. The social perceiver has also to master attributional reasoning, if s/he is to causally explain incongruent behaviours. Finally, many of the modes of incongruency resolution identified by Asch and Zukier (1984) were fairly complex, and in some of them it was necessary to simultaneously coordinate multiple dimensions referring to the same person (e.g., reality and appearance). One can assume that this cognitive sophistication, exhibited when adults deliberately process incongruent information in impression formation contexts, is unlikely to be found either in young children's processing or in adults' automatic processing.

3.2.4. INFERRING TRAITS UPON INCONGRUENT INFORMATION

The following sections take a step towards the exploration of what may be happening at a more automatic level, namely they turn to the consideration of how incongruent information about someone is processed when the social perceiver has no explicit intention to form an impression of that person (i.e., spontaneous processing), or when, even if having an explicit intention to form an impression, the social perceiver has just been confronted with the incongruent information (i.e., fast and efficient processing).

3.2.4.A) SPONTANEOUS TRAIT INFERENCE

It could be the case that when the social perceiver does not have an explicit goal to form a personality impression of someone (e.g., during a bus ride rather than a dinner party),

expectancy-incongruent behavioural information would be treated just as congruent information, in the sense that a coherent and integrated impression is not being actively pursued. In fact, as mentioned before [SEE SECTION 3.2.1.C], in numerous studies where an impression formation goal was contrasted with a memorization goal, participants in this latter condition recalled about the same amount of congruent and incongruent behaviours, suggesting that both types of behaviours were processed similarly (e.g., Hamilton et al., 1980). However, evidence coming from the *spontaneous trait inference* (STI) field refutes this idea. The most relevant studies, concerning STIs based on expectancy-incongruent behavioural descriptions, have already been mentioned in the first part of this dissertation [SEE SECTION 2.2.5.D], when the possible impacts of prior expectancies on trait inference processes were discussed. Yet, the basic outline of the studies and major conclusions will be briefly resumed in this section, focusing on the differential processing of expectancy-congruent and incongruent information even when the social perceiver is not intentionally trying to form an impression.

Wigboldus and collaborators (2003) reasoned that the vast majority of studies on STI had been conducted with material (i.e., behavioural descriptions) that did not convey any relevant expectancy, concerning the target-trait, about the actor (e.g., the tailor carries the old woman's groceries across the street; *target-trait*: helpful). In other words, one did not know whether participants would still spontaneously infer a certain trait, if this trait was incongruent with a prior expectancy. Thus, the authors tested the effects of category-based expectancies (i.e., stereotypes) on the drawing of STIs upon expectancy-congruent, incongruent, or irrelevant behavioural information. The five studies, with minor differences (e.g., supraliminal or subliminal presentation of the category), shared a common paradigm – the *recognition probe paradigm* – originally proposed by McKoon and Ratcliff (1986), and adapted to the STI study by Uleman, Hon, Roman, and Moskowitz (1996). Basically, participants read behavioural descriptions, some of them trait-implicative, and the category assigned to the actor could be either congruent or incongruent relatively to the target-trait (e.g., the boy scout (punk) helps the handicapped person). Immediately after each sentence, a probe-word appeared on screen and participants had to judge quickly whether the word was contained in the previous sentence or not. In the critical trials this word would be the trait implied by the behaviour (e.g., helpful). The rationale underlying this paradigm is that if the probe-word is inferred by the participants upon reading of the sentence, then it will be harder (i.e., they will make more mistakes or take a longer time) to recognize whether the probe was present or not in the sentence. The results showed that fewer STIs occurred when the

behaviour was expectancy-incongruent, than when it was congruent or irrelevant. Moreover, the data strongly suggested that the inference of the target-trait is inhibited at encoding when the incoming behavioural information is incongruent with the expectancy.

Ramos (2009) extended this line of research, still in the sphere of STIs, by applying different paradigms (e.g., *cued-recall paradigm*) and different materials (e.g., ambiguous behaviours, behaviours with situational continuations) to the study of how stereotypically and behaviourally induced expectancies affect spontaneous inferences. Consonantly with Wigboldus and collaborators' results (2003), participants were less likely to spontaneously infer traits when the behaviour was expectancy-incongruent, in which case participants were more likely to infer about the situation, for example.

The studies referred to in this section compellingly suggest that when social perceivers do not have the explicit goal of forming a coherent impression of someone, they still process expectancy-congruent and incongruent information differently. It seems to be the case that, in order to facilitate the mere comprehension of the incoming information, social perceivers are less likely to infer a trait that will conflict with a prior expectancy. However, a pertinent question refers to whether social perceivers who do have an explicit goal of forming a personality impression will also show a similar tendency. As mentioned earlier, expectancy-incongruent behaviours are better recalled when participants have an impression formation goal [SEE SECTION 3.2.2.A], suggesting that this type of information is processed differently from congruent information. The classic explanation for this phenomenon has been that the social perceiver effortfully considers other behavioural instances upon encountering an expectancy-incongruent behaviour, thus forming more inter-item associative links in memory [SEE SECTION 3.2.2.C]. However, one could also imagine that, at a more automatic level, an inhibition of the inference of incongruent traits plays a role. On the other hand, forming impressions is all about inferring traits, and social perceivers with the goal of forming an impression seem very proficient at combining incongruent traits in a coherent impression [SEE SECTION 3.2.3]. One could imagine, then, that social perceivers under an impression formation goal would infer as many traits as possible from behavioural information (i.e., including expectancy-incongruent information), and subsequently shape them into the impression. The next section is devoted to this question.

3.2.4.B) IMPRESSION FORMATION AND PERSON MEMORY

Jerónimo (2007) conducted a set of studies to test whether the trait inference inhibition process also operates in impression formation contexts and whether it relates to the incongruency effect. The paradigm common to all five studies was similar to the classical *person memory paradigm* by Hastie and Kumar (1979). In the majority of the experimental conditions participants were given a stereotype and trait-based expectancy about a target-person (e.g., John is a *computer programmer* and his great abilities allow him to be extremely *efficient* at work). Then participants would read a set of either expectancy-congruent, incongruent, or irrelevant behaviours, one at the time. The participants' aim, in all cases, was to form an impression of the target-person. Depending on the specific study, different measures of trait inferences were included (e.g., recognition accuracy of behaviours containing the trait label or not, latencies for the extraction of a trait embedded in a word puzzle). Results showed that participants were less likely to have inferred the trait correspondent to the behaviour when this trait opposed the previously formed impression. Moreover, this trait inference inhibition for expectancy-incongruent behaviours seemed to occur rather early (i.e., at the encoding of the information) and to be a quite efficient process (i.e., occurring even under cognitive overload). Hence, the detection of the operation of a trait inference inhibition process was extended from STIs to explicit impression formation settings.

However, Jerónimo's studies (2007) entail yet another noteworthy result. When the trait inference inhibition process is countered by including the correspondent trait in the presented behaviour (e.g., he was *foolish* enough as to have brushed his teeth with bleach to get them whiter), or by subliminally activating the trait, the incongruency effect is not obtained in the customary free-recall task. The author took this result as evidence that the better recall of expectancy-incongruent behaviours depends, in part, in the inability of the social perceiver to encode them as behavioural manifestations of the corresponding trait (as seems to happen with expectancy-congruent behaviours). Furthermore, the author suggested that social perceivers may surpass this problem either by finding an alternative trait to guide information encoding (i.e., one trait that is not inhibited by the prevailing impression), or by encoding the behaviour at a less abstract level, which would involve the consideration of previously encountered behavioural instances, as suggested by the person memory model [SEE SECTION 3.2.2.C]. Although Jerónimo's studies (2007) do not allow testing this suggestion, they still notably illustrate the relevance of studying the processing of incongruent information for the refinement of the knowledge about person perception and person memory.

INFERRING TRAITS UPON INCONGRUENT INFORMATION

The research reviewed in the preceding sections strongly suggests that when the social perceiver encounters behaviours that are incongruent with a previously activated expectancy, s/he will be less likely to generate the corresponding trait, than when the behaviour is congruent. Hence, although the social perceiver is quite capable of resolving incongruencies between two opposing traits that refer to the same target-person [*SEE SECTION 3.2.3.B*], it seems to be the case that the cognitive system protects the social perceiver from having to put in motion such complex and resource-demanding forms of processing. This idea is by itself not very innovative, since schema models, for example, already proposed that both person and group representations (i.e., impressions and stereotypes) would be protected by information selectivity, meaning that incongruent information would be “filtered, ignored, or distorted” (Stangor & McMillan, 1992, p. 44). However, schema models could hardly account for instances when incongruent information is benefitted, as happens for example in the incongruency effect, exactly because incongruent information was assumed to be faultily encoded. The present perspective, though, namely that expectancies inhibit the codification of incongruent information in more abstract and opposing terms (e.g., the inference of an expectancy-incongruent trait), provides a well specified and parsimonious explanation of how congruency may be pursued at a more automatic level, on the one hand, and how incongruency-related effects can emerge, on the other hand.

The next section focuses on another aspect related to the interplay of more automatic and more deliberate processing of incongruent information, namely to the detection of incongruency. In order for social perceivers to try to resolve a given incongruency, may it be by using a more elaborate processing, causal reasoning, or some other mode of explicit resolution [*SEE SECTION 3.2.3*], one can assume that they must have first detected the incongruency. Otherwise, one would expect that incongruent information would not suffer a different processing from congruent or even irrelevant information, for example, and that no special deliberate processing would be needed. Some studies that may provide relevant insights on incongruency detection are the ones that investigate processing differences in *novice* and *expert* perceivers of a given expertise domain. Some representative studies of this type will be discussed next.

3.2.5. INCONGRUENCY IN EXPERTISE DOMAINS

Reviewing studies that introduce the distinction between novice (or naïve) and expert participants are relevant in the context of the present dissertation for yet another reason. Research on expertise on the non-social domain (e.g., chess, algebra, physics) has generically proposed that the differences between experts' and novices' performances stem mainly from the experts' (1) larger body of knowledge, (2) more powerful encoding (i.e., larger meaningful units – *chunks* – are encoded, rather than small units), (3) more cohesive or organised knowledge representations, (4) application of more efficient procedures (i.e., automatized sequences vs. step-by-step procedures), and (5) use of appropriate strategies and actions evoked directly by a familiar pattern of information (see e.g., Fiske, Kinder, & Larter, 1983; Larkin, McDermott, Simon, & Simon, 1980). On the other hand, developmental information processing theories, mentioned earlier in this dissertation [SEE SECTION 2.4], suggest that developmental changes are produced by improvements at encoding, knowledge structuring, strategy use, and procedural automatization, which in turn are enabled by knowledge and experience accumulation (see e.g., Siegler et al., 2006). From this perspective, children can be compared to novice social perceivers and adults to expert social perceivers.⁸⁷ Thus, looking at how novices deal with incongruent information may be of high relevance for the consideration of how social perceivers do the same when complex cognitive strategies and/or structures are not guiding information processing (e.g., at more automatic levels) or have not yet developed (e.g., in young children).

One pioneering study in the expertise domain was conducted by Chase and Simon (1973) with chess players, namely a beginner, a master, and an intermediate class-A player. Among other conditions, participants were asked to reconstruct positions of about 25 pieces in a chessboard after viewing a model-chessboard for 5 sec. One crucial variable for the present discussion, though used as a mere control in the study, was that the positions to be reconstructed might be *meaningful* (i.e., actual game positions) or *random* (i.e., the same amount of pieces but placed randomly across the board). The expert's average performance for the meaningful positions was very good (i.e., about 16 correctly placed pieces), while for the random positions it was much worse (i.e., under 4 correct placements) and no better than the novice's performance. The novice's performance, on the other hand, was not visibly affected by the fact that some positions were actual game positions and some were not. While

⁸⁷ Naturally, this distinction cannot be assumed to be valid in all domains, for there may be certain social abilities that reach a ceiling level of performance early on in development.

in the original study these results were important to verify that the expert's mnemonic superiority was circumscribed to the field of expertise, they suggest another implication for the study of incongruity. If one considers the random positions to be expectancy-incongruent information, since they are not expected to be encountered in an actual game, and if only the expert, not the beginner, was troubled by this kind of information, then these findings suggest that some degree of knowledge sophistication is necessary for the detection of incongruity.

Closer to the social perception domain, Fiske, Kinder, and Larter (1983) conducted one study on political cognition with relevance for the study of the processing of expectancy-incongruent information. In this study, relative experts and novices (i.e., participants with varying levels of political involvement) read a description of a little-known country and were given the prior expectancy that this country was governed in a democratic, communist, or unspecified way. The description contained, amidst other information, some characteristics of a democracy and some characteristics of a communist regime. Because the authors were interested mainly in the differential use of knowledge-based strategies between experts and novices, and not differential knowledge per se, the democratic and communist characteristics used in the study were part of consensual knowledge (i.e., were known both by experts and novices). Experts' recall of the presented characteristics and inferences about non-presented features of the country were affected by the presence of the expectancy-incongruent information to a larger extent than novices' recall and inferences. In other words, although both experts and novices knew that a certain piece of information by itself could be considered as congruent or incongruent with the given expectancy, it seems to be the case that, while forming a mental representation of the country, experts noticed the presence of both types of information much more than novices, who showed a substantial bias towards expectancy-congruent information. Again, some sophistication in terms of knowledge structure seems to be required for incongruent information to be detected and further processed at encoding. A more densely organised knowledge structure may not only enable a faster determination that two pieces of information are incongruent, but may also, as suggested by Fiske and collaborators, facilitate the encoding of incoming information, so that more cognitive resources will be free for on-line processing of the incongruent information.

Another study whose results can be read in light of the distinction between expert and novice person perceivers was conducted by Bargh and Thein (1985), using the classic person memory paradigm (Hastie & Kumar, 1979). The authors included a group of participants for whom honesty was a chronically accessible construct (i.e., who usually described people

using this dimension, and considered it to be very important), and another group of participants for whom honesty was not chronically accessible. The first type of participants was supposed to have an “efficient processing structure” (p. 1132) for honesty-related information, and in this sense they can be considered as experts on this dimension of person perception. Conversely, the second type of participants can be compared to novices regarding the dimension of honesty. Participants were then distributed between a cognitive overload condition, with only a scarce time to read each behaviour, and a no-load condition, where each behaviour would be on screen for as long as participants wished. The congruency of the behaviours in this study was not established by a previously given expectancy, but through the relative proportion of honest and dishonest behaviours (i.e., a majority of dishonest behaviours rendered honest behaviours expectancy-incongruent, and vice-versa). Once again, the results supported the idea that when the social perception task is made more demanding, only experts, and not novices, process incongruent information differently from congruent information. In the no-load condition, both types of participants took longer to read and process the incongruent behaviours and showed the incongruency effect at recall. However, in the overload condition, novices regarding the honesty construct did not recall more incongruent than congruent items, thus suggesting that they did not process them differently.

Taken together, this set of studies originating from quite diverse domains point at the possibility that incongruent information does not trigger special forms or higher levels of processing for those who are still novice at some domain. Conversely, experts at that same domain detect incongruent information and process it accordingly (e.g., more elaborately). In this vein, it is plausible to suppose that young children, before their social knowledge structures in some domains become more sophisticated, may treat congruent and incongruent information undifferentiatedly.

In the preceding sections, where the theoretical framework for the study of incongruency in the context of impression formation was laid out, the focus has been set on studies conducted with adults. These studies have enabled the identification of interesting effects (e.g., incongruency effect, expectancy-based inhibition of trait inferences) and, most importantly, the development and specification of person memory models (e.g., the TRAP model). On occasion, typically at the end of a section, inferences of what could be expected in terms of children’s performances were drawn, but until this point no developmental studies have been directly addressed. The next section is devoted to the review of existing evidence

on how children deal with incongruent information in person perception and person memory contexts.

3.2.6. DEVELOPMENTAL EVIDENCE ON PROCESSING OF INCONGRUENT INFORMATION

3.2.6.A) FREE DESCRIPTION STUDIES

There are a number of studies in the developmental literature that have focused on children's impressions of others and of the self from a rather naturalistic perspective, namely using free description methods (e.g., Aboud & Skerry, 1983; Livesley & Bromley, 1973; Scarlett, Press, & Crockett, 1971; Watts, 1944). From those studies, the most systematic and comprehensive research of the development of children's and adolescents' impressions, is the aforementioned work by Livesley and Bromley (1973) [SEE SECTION 2.2.7.A], and thence this review centres on their results.

Participants in Livesley and Bromley's study (1973) were aged between 7 and 15 years and were requested to write descriptions of eight target-persons, well known to them, and varying in terms of gender (female vs. male), age (i.e., child vs. adult), and in the extent that the participants liked them (i.e., liked vs. disliked). The instructions given to the participants explicated that the descriptions should focus on "what sort of person they are" (p. 97) and not on physical attributes.

One relevant result, regarding the present framework, is that the 7-year-olds' descriptions consisted of the enumeration of aspects "juxtaposed by simple 'and' connections ... [resulting in] a string of unrelated statements lacking coherence and organization" (Livesley & Bromley, 1973, p. 214). On the other hand, adolescents' descriptions were markedly organised, attributes were integrated with other attributes or with the whole impression, and some attributes were given a more central role than others. Hence, the ability to form, or at least to verbally reproduce, holistic, coherent, and indivisible impressions, as adults' impressions typically are [SEE SECTION 3.2.1], seem to develop along the ontogenesis.

Another result concerns the inclusion of diverse personality traits in the descriptions. In spite of the instructions, which detailed that physical attributes were not to be included, 50% of the 7-year-olds' descriptions did not contain any psychological traits, and consisted mainly of identifying information (e.g., "he lives down Sandringham Road") and references

to appearance (e.g., “she has long hair”). In contrast, there was a steep increase in the inclusion of traits from 8-years-old on. Descriptions focusing on a single personality attribute were quite common during childhood (i.e., ranging from 30% to 24% between 7- and 12-years of age), but less frequent during adolescence. Across all age groups, except for the 7-year-olds, the majority of the descriptions included several traits evaluatively congruent with each other. The tendency to produce this kind of description increased strongly and steadily between the youngest participants (i.e., 21% of the descriptions at 7-years-old) and the oldest participants (i.e., 76% at 15-years-old). These results suggest that personality traits do not function as organising principles for the mental representation of a person from early on in the ontogenesis. The authors (Livesley & Bromley, 1973, p. 147) put forth the idea that children under 7 or 8 years of age form impressions by focusing on overt characteristics (e.g., physical appearance, possessions), and only after that age do they abstract covert characteristics (e.g., personality traits). Beyond that age, the abstraction of covert characteristics becomes increasingly differentiated, which is reflected in the transition of single trait descriptions (e.g., kind) to multiple traits descriptions (e.g., generous, friendly, helpful).

Finally, regarding incongruity, it was observed that across age groups only a minority of the impression descriptions contained traits that were evaluatively incongruent with each other. The percentage of these descriptions increased from 2% to 12% between the ages of 7 and 8 years, after which there seemed to be no age-related change. The small proportion of descriptions that include both positive and negative traits may have originated in the fact that the instructions directed the participants to evaluative consistency (i.e., asking participants to describe a person they liked/disliked, may have induced them to select extreme exemplars in the evaluative dimension). However, a noteworthy result is that “whereas younger subjects were content merely to *mention* that a person possessed positive and negative attributes, older subjects sought also to *explain* and *relate* the apparent inconsistencies” (Livesley & Bromley, 1973, p. 211, italics in the original).

According to the developmental theory of impression formation proposed by Livesley and Bromley (1973), which was assumedly inspired by the Piagetian theory of cognitive development, younger children’s impressions would be determined by salient features of the target-person’s behaviour, with no abstraction of dispositions (since the child perceiver is still cognitively egocentric). At this stage, if the target-person behaves in an evaluatively incongruent fashion, the child perceiver would regard “the other person as either absolutely good or absolutely bad (for the moment at least)” (p. 212). Hence, incongruity would not be detected, with new pieces of information leading to a fundamental, although temporary,

revision of the impression. The somewhat older child perceiver would already be able to extract more than one attribute from the target-person's stream of behaviours and would be able to consider the possibility of the co-existence of evaluatively incongruent traits. Although the child perceiver, at this stage, recognizes that the person may be "good *and* bad", and no more that the s/he must be "good *or* bad", the authors still believe that "the child is not aware of the conflict in his impressions, since his beliefs about people are too chaotic or syncretic" (p. 218). In other words, incongruity would be contained in the mental representation and stated, but not detected or resolved. Only in the final stage of development, would the social perceiver (at early adolescence) produce integrated and organised impressions of personality, by relating the extracted dispositions to each other and regarding them as part of an overall system. Some of the adolescents' descriptions, for example, contained references to the distinction between reality and appearance, which is one of the modes of incongruity resolution identified by Asch and Zukier (1984) with adult social perceivers [SEE SECTION 3.2.3.B]. In this type of personality impressions, incongruity would not only be stated, but also recognized as such and resolved.

Livesley and Bromley's results and conclusions (1973) are quite consistent with what could be expected from the studies conducted with adults, which have been reviewed in the previous sections of this dissertation. Resolving incongruities in the context of personality impressions requires a rather high degree of cognitive sophistication. Moreover, the sheer recognition of incongruity seems to be dependent on complex social cognitive processes. On the other hand, however, the "remarkable rapidity and ... great ease" (Asch, 1946, p. 258) with which adults typically can integrate a set of diverse characteristics into a unified and coherent impression, seems to be far from innate, but acquired and developed throughout the ontogenesis.

However rich in qualitative and quantitative data free description studies may be, they are, as stated before [SEE SECTION 2.2.7], particularly demanding on younger children's cognitive resources and verbal abilities. *Written* free description studies, like the one reviewed in this section, are even more so, and not only do not allow studying preschoolers' or younger children's performances, but may also lead to a substantial underestimation of the organisation and contents of young children's mental representations. Other types of study, as for example person memory studies, may provide more distilled and detailed insights of how the child social perceiver functions cognitively.

3.2.6.B) PERSON MEMORY STUDIES

The Stangor and McMillan's meta-analysis (1992), mentioned previously [SEE SECTION 3.2.2.B], included not only studies conducted with adults, but also 12 studies that had children as participants. Within this set of studies, it was found that the older the children were, the greater the tendency to recall expectancy-congruent information, which contrasts with the incongruity effect obtained with adults. However, the paradigms used in the developmental studies included in the meta-analysis had critical differences relative to the *adult* person memory paradigm, in which the incongruity effect is typically obtained. From the 12 studies, only four of them used recall measures, and the rest of them used recognition measures. As discussed earlier, only tasks that require an exhaustive memory search seem to produce the incongruity effect. Another noteworthy aspect is that none of these four studies instructed participants directly to form impressions of the target-persons. Instead, two of the studies provided participants with a memorization goal (Signorella & Liben, 1984; Stangor & Ruble, 1989), one of them with an evaluative goal (i.e., *how good* each target is; Cann & Garnett, 1984), and in the remaining paper the instructions were not specified (Jennings, 1975). Again, only when the participants are trying to form a coherent impression of the target-person is the incongruity effect to be expected, which was not the case. Other particularities of these studies comprise:

- (a) The focal expectancy was in all cases derived from gender stereotypes (especially gender roles), and was, as such, not an experimentally induced expectancy (e.g., a trait-based expectancy), but an expectancy derived from children's prior knowledge. Beyond the interest that some authors certainly had in the specificities of how sex typing and stereotyping influence children's social cognition, the gender category is an understandable choice for studies with children, since it may be considered as "self-defining and salient" (Martin & Halverson, 1981, p. 1119) from very early on, and one of the basic categories of person perception (Fiske & Neuberg, 1990) throughout the life-span. Although category-based expectancies have been successfully used in studies with adults to produce the incongruity effect (e.g., occupational stereotypes in Garcia-Marques & Hamilton, 1996), the gender category, being a dichotomous one, may be thought of as special case, in which the target-person is necessarily either an ingroup or outgroup member, relative to the participant's group membership. Besides, category-based expectancies may require a higher level of inferential processing than trait-based expectancies.

- (b) The type of incongruency used in the studies was not evaluative, in the sense that the presented behaviours were not intrinsically positive or negative, but descriptive, with the behaviours being congruent or incongruent with sex roles (e.g., a male police officer or a female truck driver, respectively).
- (c) The stimulus behaviours were only one per target (e.g., boy cooking at stove), which did not promote the integration of various items in the mental representation of the target.
- (d) In two of the studies, the stimulus presentation time was as brief as 2 sec, and the number of presented behaviours, equivalent to the number of targets, was rather high (ranging between 18 and 60; Signorella & Liben, 1984; Stangor & Ruble, 1989). Furthermore, in all studies, the proportion of congruent and incongruent items was identical.

It has been shown in studies with adults that all of these features diminish the probabilities of obtaining the incongruency effect at recall, plausibly because some of them do not foster information integration into a coherent mental representation (e.g., one behaviour per target), and the others make it harder to process information in a more elaborate way (e.g., short presentation times and multiple targets). It seems, thus, not very diagnostic for impression formation research with children, that the incongruency effect was not obtained in the studies reviewed by Stangor and McMillan (1992).

One year later, McAninch, Manolis, Milich, and Harris (1993) conducted a study, whose major difference to the studies outlined in the previous paragraphs was that 8- to 12-years-old participants were given a trait-based expectancy (i.e., that the target-child was either *shy* or *outgoing*).⁸⁸ The stimulus material was a video, in which a female or male target-child, supposedly talking about her/himself, made an equal number of expectancy-congruent and incongruent statements (amidst expectancy-irrelevant statements). A processing goal, however, was not clearly given. Immediately after participants read the trait-based expectancy, they were requested to provide some trait ratings about the target-child, which certainly fostered the formation of a first impression. Still, before participants watched the video they were admonished to pay close attention to it in order to be able to answer some questions afterwards, which may have redirected participants to a memorization goal.

The results showed no age-related changes, nor differences in recall for material that was congruent or incongruent with the trait-based expectancy. The final trait ratings (e.g., shy, friendly) seemed to be exclusively determined by the behavioural information, in that the

⁸⁸ Following this line of research in developmental literature, McAninch and collaborators (1993) were also interested in gender stereotypes. Hence, the authors considered the target-child's gender as providing a category-based expectancy (i.e., girl as *shy* and boy as *outgoing*).

differences between the shy and outgoing targets, which were found after the expectancy was introduced, disappeared after the participants watched the video. However, the expectancy affected the liking ratings, so that the outgoing target was liked more than the shy target, even after participants had seen identical behavioural information. These results seem to suggest that personality traits do not function as strong organising principles in children's person memory, although trait-expectancies can impact some aspects of children's person perception (i.e., liking of the target). However, unfortunately, it is again more likely that participants were processing information under a memorization goal, which renders this study, like the ones outlined before, less indicative of how children process incongruent material in impression formation settings.

The last study to be discussed in the present section is not strictly a person memory study, in the sense that it did not include memory measures. However, because Mrug and Hoza (2007) attempted to extend the person memory model [SEE SECTION 3.2.2.C] to pre-adult life stages, their study will be addressed in this developmental person memory section. The authors followed Srull and Wyer's formulation (1989) of the person memory model and added two well-documented developmental assumptions to the model: (a) children process information slower than adults, and (b) children hold fewer items in working memory than adults.⁸⁹ As such, children would be expected to be able to process less social information at any given time and to be bound to focus on salient aspects (e.g., generally the prosocial *mean-kind* dimension, or momentarily a dimension with personal relevance) whenever the incoming information is profuse or highly complex (e.g., containing incongruencies). Based on this idea, the authors formulated a set of predictions and tested them in a study, which manipulated prior expectancies and congruency of the incoming information.

In this study (Mrug & Hoza, 2007), kindergarteners, second-graders, and college students were given, or not given, a trait-based expectancy about a target-child. Afterwards, participants saw nine video clips (with narration to ensure intended interpretation), in which the target-child behaved in a way that would implicate three traits (i.e., *kind* or *mean*, *smart* or *not smart*, and *shy* or *not shy*). Two of the traits were always evaluatively incongruent with the third trait (e.g., a target-child could appear as *kind*, *smart*, and *shy*), thus granting a mainly positive or negative impression. After watching the video clips, participants produced trait

⁸⁹ It may be curious to note that these two developmental assumptions (i.e., processing speed and working memory limits), plus a third one introduced by the authors at the discussion of results (i.e., amount of accumulated social contact with diverse persons), correspond to some of the aforementioned variables that distinguish experts' from novices' processing: quicker routines, higher encoding capacity, and more extended knowledge, respectively.

and liking judgements about the target-child, and reaction times were collected. In a second part of the study, participants watched two new video clips, in which the target-child behaved incongruently with one of the two identically-valenced traits (e.g., behaved *meanly* when s/he had been kind, smart, and shy) and with the prior expectancy for those participants that were in the expectancy condition. Once again, trait and liking judgements, along with reaction times, were collected.

The most pervasive result obtained by Mrug and Hoza (2007) was a positivity bias in kindergartners' performances. For example, although all age groups rated the target similarly for the positive traits, kindergartners did not give negative trait ratings when the target had displayed *not smart* or *shy* behaviours. Moreover, kindergartners did not revise a positive impression of the target after watching two incongruent behaviours, but did revise a previously negative impression. Another result was that kindergartners' ratings of the incongruent trait were more influenced by the main valence of the impression than older participants' ratings. Upon this result, the authors raised the hypothesis "that the limited cognitive capacity of young children made it difficult for them to conceive of the actor as having both positive and negative qualities, thus biasing their ratings of the inconsistent trait in the direction of predominant valence" (p. 651).

Although Mrug and Hoza's paper (2007) represents an interesting effort towards extending the person memory model to the developmental sphere, their study does not allow for unequivocal conclusions about how children integrate incongruent information in the mental representation of someone (i.e., in the personality impression). The predictions formulated by the authors focused exclusively on the *vertical* links of the theorized associative network, namely in the encoding of behaviours in terms of traits, in the presence or absence of a prior expectancy, and in the production of trait and evaluative judgements. As mentioned elsewhere [SEE SECTION 3.2.2.C], however, *horizontal* or inter-item associative links would be of particular interest in the context of incongruent information processing. Furthermore, some specificities of the task complicate clear-cut conclusions: (a) three focal traits were at play, which probably imposed a highly asymmetrical demand on differently-aged participants' cognitive capacities; (b) two types of incongruency were introduced, namely evaluative incongruency between traits in the first part of the study, and evaluative and descriptive incongruency between behaviours (and expectancy) in the second part of the study; (c) the set of incongruent behaviours, at the second part of the study, was presented as having been filmed two months after the others, which may have induced participants to think

that the target-child had changed, thus fostering impression revision and not behavioural integration; and (d) there were no recall measures.

Some of the studies that have produced knowledge and insights closer to the domain of how children process incongruent information about someone have been reviewed in the previous two sections. However, there are other domains in the developmental literature where incongruency has been studied and theorized, some of which justify a brief discussion in the sense that they may provide further ideas about children's cognitive understanding of incongruency.

3.2.6.C) OTHER DOMAINS

Without intending an exhaustive overview of all the developmental domains where the processing of incongruent information has been studied, two instances will be discussed in the present section. The first one refers to Piaget's considerations about *contradiction* in his theory of cognitive development, and was selected given that this theory, "which has no rival in developmental psychology in scope and depth" (Beilin, 1992, p. 191), can be considered as having an unparalleled impact in the field.

Piaget (1924) noted from early on in his writings that children with a predominantly pre-operational form of reasoning (i.e., usually 2- to 7-year-olds) showed some propensity to contradict themselves, without seeming disturbed by the contradiction. In fact, the author elected *insensitivity to contradiction* as one of the characteristics of pre-operational thought. For example, in one of the most famous of Piaget's tasks – the *conservation of volume* task⁹⁰ (Piaget & Inhelder, 1941) –, pre-operational children first state that both glasses have the same amount of water, immediately after the transition state that the tall glass has more water than the other, and simultaneously state that no water was added. The author (Piaget, 1924) defined two types of contradiction typically committed by children at this stage: (a) *contradiction by amnesia*, in which the child seems to forget something s/he asserted earlier (e.g., that in both glasses there was exactly the same amount of water) and states the opposite now; and (b) *contradiction by condensing*, in which the child states two contradictory things about the same object (e.g., no water was added, and yet the tall glass has more water).

⁹⁰ Also known as the liquid conservation task.

In his later works, Piaget (1974) dedicated two volumes to the research on contradiction. One of the tasks designed to study how children deal with contradiction is commonly known by the *cubes and bells* task. In this task children are allowed to explore a set of five red cubes, all of them containing a bell. They are also told that the yellow and the blue cubes in sight (three of each) may or may not contain a bell. In reality one cube of each colour also has a bell. In the first part of the task children are asked to put only the red cubes inside a tube, without looking at them (i.e., a screen prevents children to see the cubes). By shaking the cubes, the children typically insert all seven cubes with bell in the tube and attest that it is full. At this point some children recognize that they have inserted more than the previously explored five red cubes, but a considerable amount of children (especially the younger) proceed to the second part of the task. For this part the screen is removed (i.e., children can now see the cubes), and children are asked once more to put only the red cubes in the tube, which results in the insertion of only five cubes. The critical part of this task for the study of contradiction comes next, with the experimenter confronting the child with the incongruity of the results of the first and second parts.⁹¹ Three different levels of response were identified. In the first level, children seemed to simply ignore the contradiction. Even when they recognized that the discrepancy was odd (usually by repetition of the procedure and prompting by the experimenter), they did not make visible attempts at resolving it. When the experimenter suggested that some yellow or blue cubes could have a bell, they refused this idea. These children tended to believe that because all red cubes have bells, all cubes that have bells must be red, which was not the case of the yellow and the blue cubes. In an intermediate level, the children started by asserting also that the red cubes have bells and the others do not, but were then troubled by the discrepancy (i.e., in Piaget's terms enter a state of disequilibrium) and eventually admitted the possibility that a cube with a bell may be not-red. At the final level, children resolve the incongruity with apparent ease stating that two of the non-red cubes must have bells as well.

Furthermore, in Piaget's theorizing contradiction does not only play an important role as a marker of developmental acquisitions (e.g., as children develop cognitively they become more capable of detecting, avoiding, or resolving contradictions), but contradiction itself is considered a propeller of development. In a work contemporaneous with the previously mentioned research on contradiction, Piaget (1975) discussed the essential role of experienced contradiction for the child to enter a state of disequilibrium, which in turn will impel the child

⁹¹ Children were allowed to repeat the procedure behind and in front of the screen after they were confronted with the contradiction.

to acquire a more sophisticated system of knowledge that will allow him/her to attain a new equilibrium (i.e., to progress in development; see also, Gallagher & Reid, 1981; Lourenço, 1997).

Moving on to the second instance of the developmental study of the processing of incongruent information to be discussed in this section, it refers to a model, much more restricted in scope, that defines a developmental sequence of five stages in the cognitive understanding of co-occurring emotions, including *opposing* emotions (Harter & Buddin, 1987). The review of this model, and of the study that supported it, was included in the present dissertation because it focuses on children's ability to integrate incongruent information. Although the targets of this integration are not traits or behaviours performed by another person (as in the case of impression formation), but rather emotions experienced by the self, the focus is still on integration of information, which, as discussed previously [SEE SECTION 3.2.6.B], was missing in the developmental person memory studies (i.e., the focus was more on the memorization of information).

Harter and Buddin (1987) started off with two dimensions of emotional experience, namely *valence* and *target*, which had been previously extracted from children's free descriptions of how two emotions can co-occur. The authors hypothesised a developmental sequence with the following levels: (a) The child does not conceive the possibility of the co-occurrence of emotions (e.g., "You can't have two feelings at the same time"); Thereafter the child sequentially conceives the possibility of co-occurrence of (b) emotions with the same valence directed towards a single target (e.g., "I was happy and proud that I hit a home run"); (c) emotions with the same valence directed to different targets (e.g., "I was bored because there was nothing to do, and mad because my mom punished me"); (d) differently-valenced emotions directed towards different targets (e.g., "I was scared my mom was going to punish me for not cleaning my room, and happy that I was watching TV"); and finally (e) differently-valenced emotions directed towards a single target (e.g., "I was happy I got a bike for Christmas but sad that it was only a 3-speed because I wanted a 10-speed").

The authors tested the model in a study where 4- to 12-years-old children were asked to describe situations in which they could feel two emotions (with same or opposing valence) towards one or two targets. The children were aided by photos of emotional expressions, which they could freely label (e.g., one child could label the photo as *glad* and another as *proud*), and placement boards with arrows pointing at one or two squares to refer to the single or multiple target condition.

The adjustment between the obtained results and hypothesised sequence of developmental acquisitions was highly satisfactory, in that 97% of the children who succeeded on the task at a given level did not fail at lower levels, and the mean age of the children who completed a given level but not the next increased monotonically (from 5 years of age at the initial level to 11 years at the final level). Moreover, the analysis of children's unsuccessful descriptions revealed that children at the initial level, who did not conceive of two emotions being felt at once, explicitly denied this possibility in one third of the cases (e.g., "It's hard to think of two feelings at the same time because you only have one mind"), or circumvented it by putting the two emotions in temporal order in two thirds of the cases (e.g., "I'd be happy that I was playing and then sad that I had to go to bed"). On the other hand, children who already mastered the co-occurrence of emotions, but still had difficulties envisioning a situation that would trigger both a positive and a negative emotion towards the same target, used the temporal order strategy one half of the times and in the other half provided non-convincing descriptions of how the two emotions refer to the same target (e.g., "I was unhappy that we were losing the ball game but happy that we were going on a field trip the next day").

While Piaget's studies and theorizing (e.g., 1974; 1975) point at the idea that children whose cognitive abilities have not yet attained a certain level of maturation will be insensitive to incongruity (i.e., will not detect it nor try to resolve it), Harter and Buddin's study (1987) suggests how difficult it may be to develop the abilities that allow for the integration of evaluatively incongruent information into a single mental representation. Before developing this ability, children seem to make use of different strategies that will protect their cognitive system from high levels of dissonance, such as rejecting the existence of incongruity itself, behaviourally ignoring it, or focusing on one aspect at the time.

3.2.7. SUMMARY AND HYPOTHESIS

Summing up, the data-to-theory part of the dissertation aims to illustrate how research conducted with children can be valuable for advancing ideas about the more basic strategies that the cognitive system uses in information processing, strategies which may subsist across development through adulthood at a more automatic level. The focal subject of this part of the research project is how incongruent information about someone is processed while the social perceiver is trying to form a personality impression of that person.

Personality impressions have a unitary and coherent nature, with the diverse bits of information being integrated rather than juxtaposed while the impression is being formed (Asch, 1946). Implicit theories of personality detained by the social perceivers allow them to go beyond the given information and assist them in forming impressions (e.g., Rosenberg et al., 1968). In memory, the information that is relevant for the personality impression of someone tends to be aggregated (Sedikides & Ostrom, 1988) in a highly organised mental representation (e.g., Hamilton et al., 1980).

When adult social perceivers form an impression of someone, and then try to remember all the information they received about that person, they are more likely to recall information that was incongruent with a prior expectancy (Hastie & Kumar, 1979). This incongruency effect tends to happen when the social perceiver was trying to integrate information, rather than to memorize it, when s/he is trying to exhaustively recall information held in memory, rather than to recognize information or make other judgements, and when s/he had enough available cognitive resources to implement an executive function (e.g., Stangor & McMillan, 1992). Highly detailed and robust socio-cognitive models, such as the person memory model (e.g., Hastie, 1980; Srull, 1981) and the TRAP model (Garcia-Marques & Hamilton, 1996), have theorized that the processing of expectancy-incongruent information leads to mental representations where the incongruent bits of information are the more densely associated.

At the expressive level, social perceivers seem to be very proficient at resolving incongruencies in impression formation. Some of the strategies to attain this resolution include: (a) selecting trait labels that better conform to the general evaluation of the person without losing descriptive adequacy (Peabody, 1967); (b) constructing a narrative that will integrate the opposing traits, for example by assigning one trait to how the person really is and the other to how the person acts (e.g., Asch & Zukier, 1984); or (c) causally explaining an expectancy-incongruent behaviour (e.g., Hastie, 1984).

However, the cognitive system seems to protect the social perceiver from having to put in motion effortful strategies to resolve incongruency by inhibiting the inference of traits that are expectancy-incongruent. This inhibition happens when the social perceiver is intentionally trying to form an impression (Jerónimo, 2007), but also when s/he does not have such a goal (e.g., Wigboldus et al., 2003). Moreover, evidence coming from several domains suggests that incongruency in the input information can go unnoticed for perceivers that lack a certain degree of cognitive sophistication in those particular domains, such as novices (e.g., Chase & Simon, 1973; Fiske et al., 1983).

Developmental evidence on children's personality impressions suggests that the ability to produce integrated impressions develops with age (Livesley & Bromley, 1973). Children also tend to recall more expectancy-congruent than incongruent information (e.g., Stangor & McMillan, 1992), but these results were not obtained in clear impression formation settings. Other developmental evidence in the non-social domain suggests that young children may be insensitive to incongruency (Piaget, 1924), while evidence coming from the emotion perception field suggests that the ability to integrate evaluatively incongruent emotions in a single representation emerges only very late in childhood (Harter & Buddin, 1987).

The literature reviewed in this theoretical framework seems to converge on the idea that, although adult social perceivers are very proficient at forming integrated personality impressions and at resolving incongruencies while doing so, this integration and resolution require complex and resource demanding processing. The abilities that underlie incongruency resolution seem to have a rather late ontogenetic onset. Resuming the ontogenetic prediction outlined in the initial chapter [SEE SECTION 1.3.2], the earlier processes and strategies used by children to deal with incongruent information are plausibly not put out by the more complex processes at adolescence and adulthood, but operate at a more automatic and overlearned level, ensuring processing even when the social perceiver cannot devote more cognitive resources to the situation. Thus, studying children's and adolescents' responses to incongruency in impression formation will contribute to the advancement of the understanding of person perception processes.

Although the studies included in this chapter of the dissertation do not aim at testing a specific hypothesis, but rather at exploring children's and adolescents' responses, considering the reviewed literature the following developmental sequence is expected:

- (a) Young children as *incongruency neglecters* in impression formation settings. This is not to say that expectancy-incongruent information will not be encoded, but rather that the incongruency will not be detected as such and will not trigger resolution attempts. Support for the idea that this may be one of the most basic cognitive strategies to deal with incongruency can be found in the novices' performances not disturbed by incongruency (e.g., Bargh & Thein, 1985; Chase & Simon, 1973; Fiske et al., 1983), the young children's insensitivity to contradiction in some non-social tasks (e.g., Piaget, 1974), and their inability to conceive a single representation that incorporates evaluatively incongruent information (Harter & Buddin, 1987).

- (b) Older children as *incongruency avoiders*. At a certain level of cognitive sophistication in the person perception domain, children will probably already have elaborated enough representations and operations at their disposal to fully detect incongruency in a given piece of information. However, they may still lack the ability to integrate and resolve incongruency, and, as such, its contemplation would impose a strain on the cognitive system. Therefore a preference for congruent information is hypothesised to occur. Older children's preferential recall of expectancy-congruent material (Stangor & McMillan, 1992), their increasingly differentiated trait vocabulary (Livesley & Bromley, 1973) and emotional vocabulary (Harter & Buddin, 1987) used primarily in single valenced descriptions, the efficient expectancy-based trait inference inhibition process (e.g., Wigboldus et al., 2003; Jerónimo, 2007), and a host of congruency biases identified in memory and judgements tasks with adults may reflect this basal cognitive preference for congruent information.
- (c) Adolescents and adults as *incongruency resolvers*. After the abilities to resolve incongruency in impression formation settings are fully developed, the social perceivers will be able to skillfully integrate incongruent information in a single mental representation, making use of differentiated implicit personality theories (Rosenberg et al., 1968), producing elaborated narratives upon request (Asch, 1946; Asch & Zukier, 1984), creating densely associated mental representations (Hastie, 1980; Srull, 1981), which in turn benefit incongruent information at recall (Hastie & Kumar, 1979). However, once these integrative abilities are more complex and resource consuming in nature, it is plausible that the ontogenetically earlier forms of incongruency processing will ensure cognitive functioning in face of incongruency whenever the social perceiver does not have either the possibility or the motivation to resolve the incongruency.

Study 4 and Study 5 were designed to explore the preference of children and adolescents for knowing more about a target-person described in congruent or incongruent terms. In both studies the stimuli were behaviours supposedly performed by the targets, and while in Study 4 the incongruency was evaluative, in Study 5 it was descriptive. Participants could then choose between listening to a story about the congruent or about the incongruent target.

Study 6 aimed at exploring children's and adolescents' willingness to conceive congruent and incongruent target-persons as real or fictional characters. The stimuli consisted of congruent and incongruent pairs of traits.

Study 7 intended to explore children's memory for expectancy-incongruent material in impression formation settings. The *person memory* paradigm (Hastie & Kumar, 1979) was thus adapted to its use with children. A trait expectancy about the target-person was introduced, and stimuli consisted of congruent and incongruent behaviours purportedly performed by the target. In these two last studies incongruency was both evaluative and descriptive.

3.3.1. STUDY 4 – THE KID WHO HELPS OTHERS AND DOESN'T LIKE TO SHARE

The aim of the first study of the *data-to-theory* part of this dissertation is to collect responses of differently-aged participants towards an evaluatively congruent and an incongruent target, in an impression formation setting. The literature reviewed in the previous sections suggests that young children may generally lack the cognitive abilities to form integrated impressions, and more particularly may have difficulties in contemplating and integrating incongruent information about a single target-person. If this is indeed the case, then young children should try to avoid entering situations where an extended contact with an incongruent target is to be expected. The main interest of this study rests in assessing children's and adolescents' more cognitively oriented responses (e.g., willingness to know more about the target-child), and only then the more socially oriented responses (e.g., willingness to interact with the target-child).

In this first study, statements including behavioural (e.g., *s/he does* something) and attitudinal (e.g., *s/he likes* to do something) information were preferred over traits (e.g., *s/he is* something), because some of the reviewed studies suggest that traits might not serve as organising principles in young children's representations of others (e.g., Livesley & Bromley, 1973; McAninch et al., 1993). However, it should be noted that even young children are able to infer traits from behaviours (e.g., Liu et al., 2007), which allows situating this study clearly in the impression formation domain (i.e., where participants should be trying to infer dispositional characteristics about others).

OVERVIEW

Two target-children were presented to the participants, who were instructed to form impressions. Each one of the targets was described by three statements: (a) one positive and two neutral statements for the *congruent* target, and (b) two positive and one negative statement for the *incongruent* target. Participants were then asked to choose which target they would like to listen a story about, how much they would like to play with each target, and how good or bad they thought each target was.

Although this study had a rather exploratory nature, considering the literature reviewed previously it was expected that younger children would prefer avoiding the incongruent target, while older children and/or adolescents would be more curious about this target [SEE SECTION 3.2.7].

3.3.1.A) METHOD

Participants

In this study participants were 14 preschoolers, 16 second-graders, 21 sixth-graders, and 13 ninth-graders. Major demographic characteristics (age and gender) for each grade-level are summarized in Table 14.

Data were collected once again at a medium-high socioeconomic status private school in the area of Cascais (near Lisbon), upon authorization and coordination with the school board of directors, and parents' informed consent. Children's and adolescents' assent to participate was checked individually at the beginning of each session.

Grade	n	Age			Gender	
		<i>M</i>	<i>SD</i>	[<i>min</i> ; <i>max</i>]	males	females
preschool	14	5y 10m	3m	[5y 6m; 6y 3m]	6 (43%)	8 (57%)
second	16	7y 9m	4m	[7y 3m; 8y 3m]	9 (56%)	7 (44%)
sixth	21	11y 8m	4m	[11y 3m; 12y 4m]	10 (48%)	11 (52%)
ninth	13	14y 9m	5m	[14y 3m; 15y 5m]	7 (54%)	6 (46%)

Table 14: Descriptive statistics concerning age (mean, standard deviation, minimum and maximum values) and gender (frequencies and percentages) of Study 4 participants

Note. y = years, m = months.

Material

The visual support material consisted of two sets (i.e., a female and a male version) of two cards, each card with a drawing of a different target-child. The drawings were created using Microsoft Office ClipArt.⁹²

The experimental material consisted of six statements, used to describe the two target-children. These statements were created so that they would be adequate to young children's daily experiences and easily understood by them. Since the social and intellectual dimensions have proved very important for impression formation (e.g., Fiske, Cuddy, & Glick, 2007; Rosenberg et al., 1968) [SEE SECTION 3.2.1.B], two statements intended to refer to the intellectual dimension, two other to the social dimension, and the remaining two to be neutral concerning both dimensions. Hence, the congruent target was described by a positive intellectual statement ("always does well on the school assignments") and the two neutral statements ("likes to take walks"; "likes to watch TV"). The incongruent target was also described by a positive intellectual statement ("always knows the right answers to the teacher's questions"), but then by a negative social statement ("doesn't like to share") and a positive social statement ("likes to help others"). Accordingly, the incongruent target was described by more pieces of positive information than the congruent target (i.e., two out of three vs. one out of three, respectively), but also by a piece of negative information, which was absent in the case of the congruent target.

Procedure

The initial part of the procedure was similar to the studies described in the previous chapter of this dissertation. The sessions were run individually by a female experimenter, who presented orally all the instructions and questions, and noted down the answers. Ninth-graders

⁹² Exemplars of these cards can be found in Appendix M1.

were forewarned that the materials were meant to be appropriate for children, but that their answers would be highly valuable in that they could provide meaningful comparisons.

Participants were told that they were about to hear information about two target-children.⁹³ Then, they were instructed to try to imagine what the targets were like and to try to think what kind of child each target was, which aimed at inducing an impression formation goal. Male participants were presented with the male version, while female participants got the female version. The first target was then introduced by the experimenter (“this kid here”), who would place the respective card at the table in front of the participant and recite the corresponding three statements at a slow pace (approx. 5 sec between the beginning of each statement). The second target was introduced immediately after the first with an analogous procedure (i.e., prompting “this other kid”, placing the card, and reciting the three other statements). The presentation order of the congruent and incongruent targets was counterbalanced between participants.

Next, participants were guided through the dependent measures, which are detailed further down. In one of those measures participants chose to listen to a story either about the congruent or the incongruent target. After all the dependent measures were collected, the experimenter told the story to the participants, which in reality was always the same one. The narration of the story was accompanied by a Microsoft Office PowerPoint 2003 presentation, set up with edited graphics from Microsoft Office ClipArt, featuring the chosen target-child (i.e., there were four versions of the images, two female and two male).⁹⁴

Finally, participants were thanked for their collaboration and dismissed.

Design

Participants within each grade-level and gender were presented with two types of targets (i.e., within-subjects variable), in counterbalanced order. The resulting design can be formalized as follows: 4 *grade-levels* (preschool vs. 2nd-grade vs. 6th-grade vs. 9th-grade) × 2 *versions* (female vs. male) × 2 *orders* (congruent first vs. incongruent first) × 2 *target-types* (congruent vs. incongruent).

Dependent Measures

Cognitive contact measure. The focal dependent measure of this study aimed at assessing whether differently-aged participants preferred to continue to think, or to know

⁹³ See Appendix M1 for the text used in the presentation of the target-children.

⁹⁴ See Appendix M2 for the images and script of the final story.

more, about a congruent or an incongruent target. Immediately after the presentation of the two targets, participants were given the choice to listen to a story about one of them. This dichotomous forced option was practically a behavioural measure, in the sense that participants actually then listened to a story they believed to have chosen. However, so that the content of the story would not influence the remaining dependent measures, participants were assured that the story would be told after a few more questions, and the other dependent measures were introduced.⁹⁵

Social contact measure. This measure intended to assess the extent of participants' predicted willingness to interact with a target that had been described either in congruent or incongruent terms. After participants had made the cognitive contact choice, they were asked to rate how much they "would like to play"⁹⁶ with the chosen target in a 5-point pictorial scale. The points of the scale were represented by circles of increasing size and the extreme points were labelled *nothing at all* and *very much*.

Evaluative ratings. Participants were then asked to judge whether the target they had chosen before was a *very good* kid, a *very bad* kid, or something in between. The 5-point pictorial scale ranged from a frowning face to a smiley face.

After participants answered the social contact and the evaluative rating measures regarding the target chosen at the cognitive contact measure, they were once again asked to answer the social contact and evaluative rating measures, this time regarding the non-chosen target.

3.3.1.B) RESULTS

Cognitive contact measure

The frequency of participants, at the four grade-levels, who chose to listen to a story either about the congruent or the incongruent target is inscribed in Table 15 and depicted, in terms of percentages, in Figure 6.

⁹⁵ An exemplar of the coding sheets can be found in Appendix N.

⁹⁶ Or "would like to hang out" for adolescent participants.

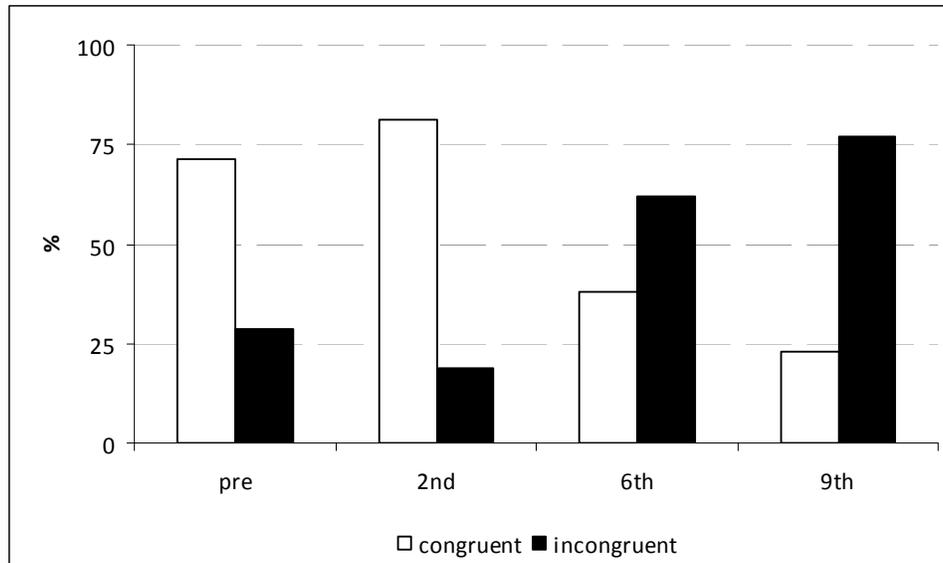


Figure 6: Percentages of cognitive contact choice either with the congruent or the incongruent target for each grade-level in Study 4

An overall chi-square test performed on the 4 (grade-level) \times 2 (target-type) contingency table was significant, $\chi^2(3, N = 64) = 13.58, p = .004$, indicating that the choice of the congruent or incongruent target was not independent from the grade-level. In order to test whether the departure from independence was consistent with an age-related linear trend, a regression technique suggested by Everitt (1977) was employed. Basically, linear coefficients (i.e., -3; -1; 1; 3) were assigned to the four levels of school-grade, since this variable had an ordinal nature, binary coefficients (i.e., 0; 1) were assigned to the two types of target, and then the regression was calculated. This procedure allowed partitioning the overall chi-square statistic into a highly significant linear component, $\chi^2(1, N = 64) = 10.51, p = .001, r^2 = .164$, and a non-significant residual, $\chi^2(2, N = 64) = 3.08, p = .215$. In more substantive terms, this result means that the tendency to choose listening to a story about a target-child who was previously described by incongruent statements, over a story about a congruent target, increases with age. Hence, while preschoolers and second-graders seemed to prefer to avoid thinking more about an incongruent target, ninth-graders clearly seemed to be more comfortable with, and curious about, knowing more about such a target.

The version of the material (i.e., female vs. male), or the gender of the participants, did not influence the direction of the choice for the congruent or incongruent target at any of the grade-levels.⁹⁷ The order of presentation (i.e., whether the incongruent target was presented first or last), though, seem to have had some impact in participants' choices. Table 15

⁹⁷ See Appendix O1 for the three-dimensional contingency table with *version* as a variable.

contains the values obtained for the *order* variable. Statistical analyses were not run with these multidimensional tables, since the *version* and *order* variables were quite successfully blocked in the design (i.e., were distributed equally across grade-levels), and they were not focal variables of the present study. Nevertheless, it may be interesting to note that overall participants chose more frequently to listen to a story about the last target to be presented (in average 66% of the times, when 50% would be expected if order of presentation did not impact choice; see *recency* column).

Choice per grade	<i>n</i>	Order of presentation		Recency	Totals
		congruent first	incongruent first		
Preschool	14				
<i>congruent</i>		4	6		10
<i>incongruent</i>		3	1	64%	4
Second	16				
<i>congruent</i>		6	7		13
<i>incongruent</i>		2	1	56%	3
Sixth	21				
<i>congruent</i>		2	6		8
<i>incongruent</i>		9	4	71%	13
Ninth	13				
<i>congruent</i>		0	3		3
<i>incongruent</i>		6	4	69%	10

Table 15: Frequencies of cognitive contact choice with the congruent and incongruent target per grade-level and order of presentation in Study 4

Preschoolers tended to chose more frequently to listen to a story about a congruent target, $Z = 1.34$, $p = .091$,⁹⁸ and ninth-graders a story about an incongruent target, $Z = 1.34$, $p = .048$, independently of the order of presentation. Still, in both groups there was some tendency to choose the last target to be presented. Second-graders chose more often the congruent target, $Z = 2.25$, $p = .012$, and their choices seem to have been quite independent of presentation order. In stark contrast, sixth-graders' choices seem to have been more influenced by presentation order than by the type of target, $Z = 0.87$, $p = .191$. In fact, it was in the sixth-grade that the higher values of recency in choice were obtained and an interaction between presentation order and target-type was detectable (i.e., the incongruent target was chosen more frequently when it was the last one to be presented, but was less chosen when the congruent target was the last to be presented).

⁹⁸ Given by one-tailed sign tests.

Social contact measure

The data obtained with the two scales that aimed at assessing the participants' willingness to engage in social contact (i.e., play/hang out) with the congruent and incongruent targets are described in Table 16 and were analysed using a 4 (grade-level) \times 2 (order) \times 2 (target) repeated measures ANOVA with two between-subjects factors. The variances obtained in the ratings for both targets were not homogeneous,⁹⁹ and so, once again, an ANOVA with rank-transformed data¹⁰⁰ was preferred over the analogous ANOVA with the raw data.¹⁰¹ The *version* factor did not produce any significant effect or interactions, and was thus excluded from the reported analyses.

Group	Target	Descriptive			Contrasts			
		<i>n</i>	<i>M</i>	95% CI	<i>SD</i>	<i>t</i> (56)	two-tailed <i>p</i>	η_p^2
preschoolers								
	<i>congruent</i>	14	4.50	[3.91; 5.09]	1.02	3.81	< .001	.205
	<i>incongruent</i>		3.07	[2.18; 3.96]	1.54			
2 nd -graders								
	<i>congruent</i>	16	4.50	[4.16; 4.84]	0.63	4.03	< .001	.224
	<i>incongruent</i>		3.25	[2.62; 3.88]	1.18			
6 th -graders								
	<i>congruent</i>	21	3.90	[3.71; 4.10]	0.44	2.89	.006	.129
	<i>incongruent</i>		3.14	[2.78; 3.50]	0.79			
9 th -graders								
	<i>congruent</i>	13	4.00	[3.45; 4.55]	0.91	2.24	.029	.082
	<i>incongruent</i>		3.23	[2.73; 3.73]	0.83			

Table 16: Descriptive statistics of the social contact measure (means, 95% confidence intervals, and standard deviations) and test statistics with respective p-values and effect sizes for the contrasts between targets of Study 4

The grade-level produced a marginally significant effect, $F(3, 56) = 2.62$, $p = .059$, $\eta_p^2 = .123$, denoting that, in general, the stated willingness to interact socially with any one of the targets tended to decrease with age towards the midpoint of the scale.¹⁰² This effect was qualified by a significant interaction with the *order* factor, $F(3, 56) = 3.90$, $p = .013$, $\eta_p^2 = .173$, revealing that the age-related decrease in the willingness for social contact was obtained only when the incongruent target was presented first and the congruent target was presented last.

⁹⁹ See Appendix O2 for the Levene's tests per target.

¹⁰⁰ Since the present ANOVA was a repeated measures ANOVA, the rank transformation was performed over the total number of observations (i.e., joining the ratings for the congruent and incongruent targets).

¹⁰¹ Both ANOVAs produced the same significant effects; see Appendix O2 for the ANOVA tables.

¹⁰² This effect did not approach significance in the ANOVA performed on raw data.

More interesting for the present purposes, however, was the significant difference between targets in the social contact measure, $F(1, 56) = 41.43, p < .001, \eta_p^2 = .425$, which was not qualified either by grade-level or order of presentation (see the full lines of Figure 7 for an illustration of this effect). Hence, although sixth- and ninth-graders chose more frequently the incongruent target for cognitive contact (i.e., to listen a story about), all grade-levels preferred the congruent target for social contact (i.e., contrasts between targets in all grade-levels were significant; see Table 16). Still, a linear age-related trend was detected, via contrast analysis,¹⁰³ for the congruent target, $t(56) = 2.52, p = .015, \eta_p^2 = .102$, while for the incongruent target no such trend was statistically significant, $t(56) < 1$.

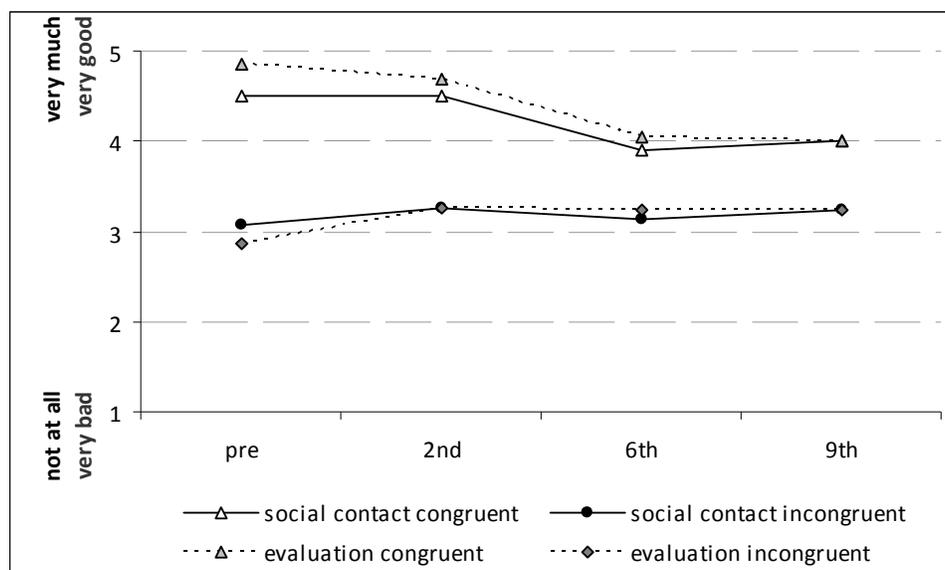


Figure 7: Ratings of the social contact measure (full lines) and evaluative measure (dotted lines) for each grade-level and target in Study 4

Evaluative ratings

As can be intuited from Figure 7, the evaluative ratings collected for both targets (i.e., dotted lines), or the extent to which participants judged the targets to be *bad* or *good*, share some characteristics with the social contact measure (i.e., full lines). The descriptive statistics concerning the evaluative ratings are presented in Table 17. A 4 (grade-level) \times 2 (order) \times 2 (target) repeated measures ANOVA with two between-subjects factors was performed on the raw data, since the normality and the variance homogeneity assumptions were satisfied.¹⁰⁴ Although the *order* factor did not produce significant effects or interactions in this analysis, it

¹⁰³ Contrasts using linear polynomial coefficients (i.e., -3, -1, 1, 3).

¹⁰⁴ See Appendix O3 for the distribution histograms and Levene's tests per target.

was kept in the ANOVA model, due to the fact that it accounted for some of the variance in the previous measures with the same participants. Once again, the *version* factor did not contribute with any significant effect, and was thus excluded from the analyses.

Group	Target	Descriptive				Contrasts		
		<i>n</i>	<i>M</i>	95% CI	<i>SD</i>	<i>t</i> (56)	two-tailed <i>p</i>	η_p^2
preschoolers								
	<i>congruent</i>	14	4.86	[4.65; 5.07]	0.36	7.42	< .001	.496
	<i>incongruent</i>		2.86	[2.15; 3.57]	1.23			
2 nd -graders								
	<i>congruent</i>	16	4.69	[4.37; 5.01]	0.60	5.70	< .001	.367
	<i>incongruent</i>		3.25	[2.84; 3.66]	0.77			
6 th -graders								
	<i>congruent</i>	21	4.05	[3.87; 4.22]	0.38	3.67	.001	.194
	<i>incongruent</i>		3.24	[2.89; 3.59]	0.77			
9 th -graders								
	<i>congruent</i>	13	4.00	[3.57; 4.43]	0.71	2.71	.009	.116
	<i>incongruent</i>		3.23	[2.73; 3.73]	0.83			

Table 17: Descriptive statistics of the evaluative ratings (means, 95% confidence intervals, and standard deviations) and test statistics with respective *p*-values and effect sizes for the contrasts between targets of Study 4

The *target-type* factor yielded again a highly significant effect, $F(1, 56) = 48.42$, $p < .001$, $\eta_p^2 = .629$, with participants from all grade-levels rating the congruent target more positively than the incongruent target (see contrasts in Table 17). This time, the interaction between target-type and grade-level attained significance, $F(3, 56) = 5.08$, $p = .004$, $\eta_p^2 = .214$, but the more detailed analysis of this interaction produced results that are similar to the ones obtained with the social contact measure. Namely, while evaluations of the congruent target decreased linearly with grade-level, $t(56) = 5.03$, $p < .001$, $\eta_p^2 = .311$, evaluations of the incongruent target did not increase or decrease linearly, $t(56) = 1.06$, $p = .293$, $\eta_p^2 = .020$.

Association between dependent measures

In order to further explore eventual relations between the dependent measures of this study, Pearson product-moment correlation coefficients were calculated between all five measures (i.e., cognitive contact, social contact with the congruent and incongruent targets,

and evaluation of the congruent and incongruent targets)¹⁰⁵, separated for each grade-level and for the total sample.¹⁰⁶

As expected from the previously presented results, the willingness to interact socially with each target was associated with his/her evaluation. For the incongruent target the overall association was $r(62) = .58, p < .001$, and it was particularly expressive in the younger groups (preschool: $r(12) = .69, p = .006$; 2nd-grade: $r(14) = .73, p = .001$). For the congruent target the overall association was $r(62) = .42, p < .001$, and while the correlation was quite large for the sixth-graders, $r(19) = .62, p = .002$, it was very low for second-graders, $r(14) = .09, p = .747$. Thus, generally, the more participants judged a particular target to be a nice person, independently of being someone who was described in congruent or incongruent terms, the more they reported willingness to socially interact with this target.

Another interesting result was that neither the willingness for social contact nor the evaluations of one of the targets correlated with the ratings provided for the other target. This result suggests that participants were not primarily trying to establish comparisons between the targets, but rather attempting at providing independent judgements for each target, which strengthens confidence on the used paradigm.

Finally, the preference for cognitive contact with the congruent target was significantly associated with more willingness for social contact with that target only for second-graders, $r(14) = .65, p = .006$. In contrast, the preference for cognitive contact with the incongruent target correlated significantly with more willingness for social contact with the incongruent target only for ninth-graders, $r(11) = .61, p = .025$. The inexistence of other statistically significant correlations between the cognitive contact and the other measures should be interpreted with extreme caution, though, since in all grade-levels, except maybe for the sixth, the cognitive contact measure provided sample size splits that deviate clearly from 50/50, thus potentiating attenuation of the coefficients (e.g., Becker, 1986).

3.3.1.C) DISCUSSION

The results obtained in the present study suggest that, in an impression formation setting, young children prefer to think, or to know more, about a target-child who is described

¹⁰⁵ For the correlation between the dichotomous cognitive contact measure and the other variables, the point-biserial correlation coefficient was calculated, which is a mathematical equivalent of the Pearson product-moment correlation coefficient.

¹⁰⁶ A table containing all coefficients can be found in Appendix O4.

in congruent terms. In contrast, adolescents seem to prefer to know more about an incongruent target. This finding is in consonance with the prediction that young children, having fewer cognitive resources and abilities to resolve incongruity, would try to avoid cognitive contact with this type of information, while older children would increasingly be more comfortable with processing incongruent information about a person.

In greater detail, it can be said that the youngest children in the sample (i.e., preschoolers) chose more frequently to have further cognitive contact with the congruent target, but that their choices were somewhat influenced by the order of presentation, suggesting that they avoided incongruity less consistently than the group of second-graders, for example.

The second-graders were the group that more clearly avoided cognitive contact with the incongruent target, not only by consistently preferring to listen to a story about the congruent target, but also by being less influenced by contextual factors, such as order of presentation. These children's preference for socially interacting with the congruent target, which, unlike other groups, correlated significantly with their preference for cognitive contact with the congruent target, may constitute another reflection of this avoidance tendency. Namely, if incongruity is a burden for a cognitive system that already understands it as incongruity, but is not yet capable of making sense of it, seeking to socialise primarily with congruent targets is a sensible option.

In the group of older children (i.e., the 6th-graders) the tendency to prefer knowing more about the congruent over the incongruent target reversed. This was the group where the proportions of choice between targets for cognitive contact were more balanced, and where the children were more influenced by extraneous factors, as the presentation order of the targets. These findings suggest that around late childhood the expressiveness of earlier avoidance tendencies towards incongruity decreases, and that a preference for thinking about persons described in incongruent terms may be starting to settle in.

Finally, the group of adolescents (i.e., the 9th-graders) showed a preference for knowing more about the incongruent target, although their choices were still influenced, to some extent, by the order of presentation. This was the only group in the overall sample where choosing to listen to a story about the incongruent target correlated significantly with an increased wish to socially interact with that same target. In the same line of reasoning to the one applied to the interpretation of second-graders' results, if the cognitive system is already capable of dealing successfully with incongruent information about someone, then socialising with an incongruent person may be stimulating.

Across all grade-levels, participants predicted they would like to socialise with the congruent target and perceived this target generally as a good person. The extent to which participants made this prediction and judgement, however, decreased linearly with age. In contrast, the willingness to socialise with the incongruent target was only moderate, and lesser than with the congruent target, at all grade-levels. This target was also perceived as being neither a good nor a bad person. Moreover, no age-related differences were detected in these ratings regarding the incongruent target. This dissociation between the results of the cognitive contact measure, on the one hand, and the results of the social contact measure and evaluative ratings, on the other hand, is quite interesting. Namely, it points at the possibility that, while differently-aged social perceivers increasingly seek information about an incongruent target, possibly in order to better resolve and integrate the incongruencies in the personality impression, they do not generally value incongruency as a positive feature. In other words, the dissociation may be signalling that there are age-related changes in the way social perceivers cognitively construe a mental representation of someone, which are independent, at least in part, of the way social perceivers evaluate others.

However, a major shortcoming of the present study is that although the incongruent target was described by more pieces of positive information than the congruent target, it was the only target to be described by a negative statement. This occurrence may have at least two important consequences. First, it may be the case that the different measures included in the present study were differentially sensitive to the presence of negative information about someone. It has been shown, for example, that adult social perceivers are cognitively captivated by negative information and simultaneously let this information influence the impression more heavily than positive information (Fiske, 1980). Thus, in the present study, the just described dissociation between the cognitive and the social contact measures may have come about because this cognitive preference for processing negative information, in impression formation settings, may have a later ontogenetic onset than the tendency for negative information to be more influential in liking and evaluative judgements. In other words, there is a confound between incongruency and negativity in the targets' descriptions, and the results obtained in the different dependent measures may have been due, integrally or partially, to the assignment of the only negative piece of information to the incongruent target.

Second, and in a related vein, it may be the case that the sensitivity to negative information is itself age-dependent. In fact, scattered across developmental literature, one can find a number of instances where young social perceivers exhibited positivity biases in the prediction of the behaviour of others (e.g., Newman, 1991; Rholes & Ruble, 1984, 1986) and

in the assignment of traits and abilities (e.g., Mrug & Hoza, 2007) much more than older children and adolescents did, suggesting that young children may try to avoid being confronted with negative social information. In this case, the confound between incongruency and negativity would be even more complex, in the sense that the younger groups might have been responding mainly to the negativity enclosed in the target's description (i.e., trying to avoid it), while older groups, less sensitive to negativity, might have been influenced mainly by the incongruency in the description.

This shortcoming of the study could not be completely overcome within the present paradigm. One interesting idea would be to try unconfounding negativity and incongruency by pitting a negative congruent target (instead of the present congruent target) against the incongruent target, for example. However, the above discussed consideration that the social processing of negative information may change substantially with age would once again limit the interpretation of such a test. Namely, there could be a serious disproportion between younger and older age-groups' perception of the negative statements in general, and of the negative target in particular, which would complicate the results interpretation.

In spite of this shortcoming, the results of the present study were considered interesting enough to stimulate the pursuit of the exploration of how differently-aged social perceivers respond to incongruency in impression formation settings. Hence, in the following study, participants were again confronted with targets described either in congruent or incongruent terms, but this time bypassing the valence problematic, as much as possible.

3.3.2. STUDY 5 – SITTING AWAY FROM ONE'S BEST FRIEND

The aim of the present study is quite similar to the previous study's aim, namely to examine the responses of younger and older children, as well as adolescents, to incongruency in an impression formation setting. The major difference lies in the fact that for this study descriptive incongruency, rather than evaluative incongruency, was used. As explained in the discussion section of the preceding study, the use of evaluative incongruency entails the problem of constraining the incongruent target's description to contain negative (as well as positive) information. Thus, in order to circumvent the problems associated with valenced material, in this study the incongruent target was described by inconsistent statements that did not necessarily carry either a positive or a negative value. Moreover, in order to ensure that the congruent and the incongruent targets did not differ in perceived positivity from the

outset, both targets' descriptions were pre-tested concerning the two major underlying dimensions in personality impressions judgements (i.e., social and intellectual desirability; Fiske et al., 2007; Rosenberg et al., 1968).

Other minor differences between the previous and the current study are the inclusion of an undergraduate sample and the exploration of participants' explicit causal attributions concerning the targets' behaviours. Although there were no theoretical reasons to expect that the undergraduates' responses would differ from the ninth-graders' ones, collecting data within the same paradigm with young adults, who constitute a better studied population regarding impression formation tasks, may certainly be of worth to obtain a more comprehensive view of eventual age-related changes. Regarding the causal attributions, it seems of particular interest to look at how differently-aged participants explain the behaviour of the incongruent target. These explanations were expected to provide insights about the psychological strategies used at different age-levels to deal with incongruent information.

OVERVIEW

Again, two target-children were presented to the participants, who were instructed to form impressions. The *congruent* target was described by behaviours that were consistent over time (i.e., s/he did always the same thing) and that were congruent with a prior expectancy (i.e., s/he sat next to her/his best friend). The *incongruent* target was described by inconsistent behaviours (i.e., sometimes s/he did one thing, some other times s/he did another thing), one of which was incongruent with the prior expectancy (i.e., s/he did not sit next to her/his best friend). The focal dependent measure was again which target would be selected by the participants to listen to a story about. Further measures were the extent to which participants predicted they would enjoy interacting with each target and to which extent they judged each target to be a nice or a mean person. Moreover, participants' explanations for the targets' behaviours were collected.

The results were expected to replicate the pattern obtained in the last study, namely that until late childhood participants would prefer avoiding cognitive contact with the incongruent target, while adolescents, and in the present case young adults too, would prefer having cognitive contact with this type of target. However, if one of the major forces behind younger children's rejection of the incongruent target in the previous study had been the negative information, it could also be the case that these children would now not show a clear preference for either type of target.

3.3.2.A) METHOD

Participants

The 80 participants in this study were preschoolers, second-, sixth-, ninth-graders, and undergraduates (16 participants in each grade-level). In all groups 50% of the participants were females, except for the undergraduates' group, which contained 94% female participants (i.e., only one male participant). Descriptive statistics concerning participants' age per grade-level are summarized in Table 18.

Child and adolescent participants came from the same background, and were recruited with the same procedures, as in Study 4. Adult participants were undergraduate students at ISCTE-IUL, Lisbon, and their participation granted them credits for a psychology course.

Grade	Age		
	<i>M</i>	<i>SD</i>	<i>[min; max]</i>
preschool	5y 7m	4m	[5y 1m; 6y 1m]
second	7y 7m	4m	[6y 8m; 8y 1m]
sixth	11y 2m	7m	[10y 5m; 11y 11m]
ninth	14y 8m	4m	[14y 0m; 15y 2m]
undergraduate	19y	2y	[17y; 25y]

Table 18: Descriptive statistics concerning age (mean, standard deviation, minimum and maximum values) of Study 5 participants
 Note. All n=16. y = years, m = months. 50% males and females in each grade-level, except for undergraduates (94% females).

Material

For the current study the presentation of the target-children was pre-recorded and accompanied by images visible in a computer screen.¹⁰⁷ All the information about one of the targets was given, succeeded by all the information about the other target. Both targets were introduced as having a best friend, who reciprocated their affection. The difference between targets resided in the fact that the *congruent* target always chose to sit next to her/his best friend, while the *incongruent* target sometimes chose to sit and sometimes chose not to sit next to her/his best friend.

¹⁰⁷ The images and script of the presentation can be found in Appendix P.

The images were created using Microsoft Office ClipArt and the narration was recorded by a female voice. The combined presentation was set up using Microsoft Office PowerPoint 2003. There were eight versions of the presentation, resulting from the crossing of gender (female and male versions), order (congruent first and incongruent first versions), and visual targets (figure 1 first and figure 2 first versions).

The congruent and incongruent targets were pre-tested with a sample of 10 female participants per grade-level (excluding undergraduates), using the above described presentation, in order to establish whether there were any differences of perceived social and intellectual desirability between targets. The details of this pre-test are reported in Appendix Q. Generally, the congruent and incongruent targets were perceived as being identically *nice* and *smart*, suggesting that there were no marked differences in terms of valence in the way both targets were perceived. Sixth-graders, however, constituted an exceptional case, having judged the congruent target in a substantially more positive light than the incongruent target, both in the social and intellectual dimensions. As discussed in the pre-test report [SEE APPENDIX Q], the current material was still selected to be used in the present study, but special attention in the interpretation of the sixth-graders' eventual results is warranted, in the sense that in this grade-level (but not in the other three) there will be a confound between congruency and perceived valence of the targets.

Procedure

The procedure of the current study was very similar to the one used in the previous study. Sessions were run individually and by the same female experimenter. The setting for child and adolescent participants was a small meeting room at their school, while adult participants were tested in a room of the Social and Organisational Psychology Laboratory (LAPSO) of the ISCTE-IUL, Lisbon.

Participants were given an impression formation goal, namely they were instructed to imagine what the target-children were like and what sort of person each target was. Then, the presentation of the two targets was played on the computer.¹⁰⁸ As before, male participants watched male versions and female participants watched female versions. However, in the current procedure, besides presentation order of the congruent and incongruent targets, the visual appearance of the first and second targets to be presented was also counterbalanced.

¹⁰⁸ Please recall that the images and script of the presentation can be found in Appendix P.

After watching the presentation, participants were guided through the dependent measures by the experimenter, who noted their answers. These measures were very similar to the ones used in the previous study and are detailed below. Because the first measure required participants to choose one of the targets to listen to a story about, at the end of the procedure a story (the one used in Study 4) was told to the participants.¹⁰⁹ Lastly, the participants were dismissed upon appreciation for their collaboration.

Design

Participants within each grade-level and gender were distributed randomly across four versions of the presentation (i.e., order of presentation and visual targets were counterbalanced). The two types of target were manipulated within subjects, yielding the following design: 5 *grade-levels* (preschool vs. 2nd-grade vs. 6th-grade vs. 9th-grade vs. undergraduate) × 2 *genders* (female vs. male) × 2 *orders* (congruent first vs. incongruent first) × 2 *visual targets* (figure 1 first vs. figure 2 first) × 2 *target-type* (congruent vs. incongruent).

Dependent Measures

Cognitive contact measure. As in Study 4, the focal measure of this study was participants' choice to listen to a story either about the congruent or the incongruent target.¹¹⁰ This measure was intended as an operationalization of participants' preference for learning or thinking more about one of the targets.

Social contact measure. The measure for assessing participants' predicted willingness to interact with each one of the targets was the same as in the previous study, namely the question "How much do you think you would like to play/hang out with this kid" together with a 5-point pictorial scale of increasing size circles, anchored at *nothing at all* and *very much* at each extreme.

Evaluative ratings. This measure suffered a minor change, since the labels used in Study 4 (*very bad* and *very good*) seemed too extreme. Thus, participants were asked to rate each target in the same 5-point pictorial scale, ranging from a frowning to a smiley face, but this time anchored at the labels *mean* and *nice*.

Behaviour explanations. After responding to the other dependent measures, participants were asked to attribute causes to the two target-children's behaviour, prompted

¹⁰⁹ Please recall that the images and script of this story can be found in Appendix M2.

¹¹⁰ See Appendix R for an exemplar of the coding sheets.

by “Why do you think this kid always chooses to sit next to her/his friend?” and “And why do you think this kid sometimes chooses to sit next to her/his friend and some other times doesn’t?”. This measure was included mainly to explore how participants made sense of the inconsistent behaviour of the incongruent target.

In the current study, after responding the first measure (i.e., the cognitive contact measure), participants produced the social contact and the evaluative ratings for the first target they had seen in the presentation and afterwards the correspondent ratings for the second target of the presentation. Behaviour explanations were produced at the end and, again, following the original order of presentation.

3.3.2.B) RESULTS

Cognitive contact measure

Figure 8 shows the percentage of participants in each grade-level who chose to listen to a story either about the congruent or the incongruent target.

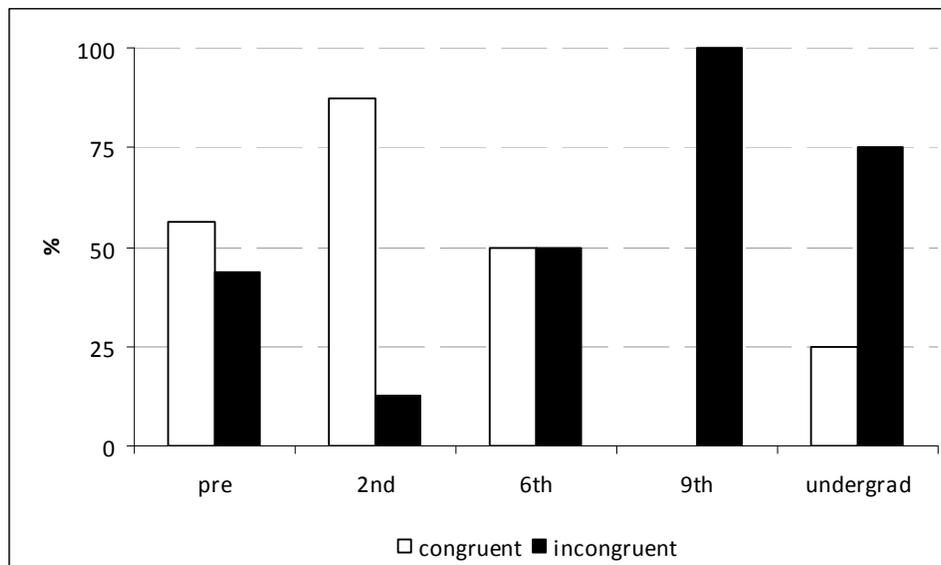


Figure 8: Percentages of cognitive contact choice either with the congruent or the incongruent target for each grade-level in Study 5

The overall chi-square statistic calculated upon the 5 (grade-level) \times 2 (target-type) contingency table was highly significant, $\chi^2(4, N = 80) = 28.44, p < .001$, attesting the association between grade-level and choice of target. The linear component of this association

was once again significant, $\chi^2(1, N = 80) = 14.63, p < .001, r^2 = .183$, which means that as the grade-level increases, so does the probability that listening to a story about the incongruent target is chosen over a story about the congruent target. However, in the present study, the residual component of the overall association was significant as well, $\chi^2(3, N = 80) = 13.82, p = .003$, indicating that a substantial part of the departure from independence between the two variables is not explained by the age-related linear trend.

Contrasting with the previous study's results, preschoolers in the present study seem to not have actively tried to avoid thinking more about the incongruent target, namely their choices between targets were fairly balanced, $Z = 0.25, p = .401$.¹¹¹ At all other grade-levels, the pattern of results was consistent with the pattern obtained in Study 4, with second-graders clearly avoiding listening more about the incongruent target, $Z = 2.75, p = .003$, while ninth-graders, $Z = 3.75, p < .001$, and here undergraduates as well, $Z = 1.75, p = .040$, actively sought more knowledge about this target. The sixth-graders' pattern of choices is consistent with an intermediate stage of this tendency shift.

The gender variable had again no visible impact in the direction of choice for cognitive contact in any of the grade-levels.¹¹² In contrast, the order of presentation variable seems to have once again influenced choices to a certain degree. The observation of the values inscribed in Table 19 allows concluding that, this time, the effect of order was more erratic across grade-levels than in the previous study (i.e., there was a tendency for preschoolers and undergraduates to choose the first target to be presented, while 2nd- and 6th-graders tended to choose the last target). However, consistently with the results of Study 4, the order of presentation interacted with the cognitive contact measure only in the sixth-grade sample, where participants did not show a preference either for the congruent or incongruent target, but chose the last target to be presented 75% of the times. Ninth-graders' choices were independent of presentation order. The above analysis of the *gender* and *order* effects obtained with this particular participants sample is intended as merely descriptive, since, as it was also the case in the previous study, both variables were successfully blocked in the design and are not focal measures of the study.

¹¹¹ Given by one-tailed sign tests.

¹¹² See Appendix S1 for the three-dimensional contingency table with *gender* as a variable.

Choice per grade	Order of presentation		Recency	Totals
	congruent first	incongruent first		
Preschool				
<i>congruent</i>	5	4	44%	9
<i>incongruent</i>	3	4		7
Second				
<i>congruent</i>	6	8	63%	14
<i>incongruent</i>	2	0		2
Sixth				
<i>congruent</i>	2	6	75%	8
<i>incongruent</i>	6	2		8
Ninth				
<i>congruent</i>	0	0	50%	0
<i>incongruent</i>	8	8		16
Undergraduate				
<i>congruent</i>	3	1	38%	4
<i>incongruent</i>	5	7		12

Table 19: Frequencies of cognitive contact choice with the congruent and incongruent target per grade-level and order of presentation in Study 5
Note. All n=16.

Social contact measure

The descriptive statistics of the data obtained with the social contact measure (i.e., the predicted willingness to engage in social interaction with each one of the targets) are presented in Table 20 and represented as the full lines of Figure 9. Higher values mean a higher perceived willingness for social contact. The data were further analysed using a 5 (grade-level) \times 2 (order) \times 2 (target) repeated measures ANOVA with between-subjects factors. Because the homogeneity of variances could not be assured for the incongruent target,¹¹³ the reported ANOVA was performed with the rank-transformed data.¹¹⁴

¹¹³ See Appendix S2 for the Levene's tests per target.

¹¹⁴ The ANOVA performed with the raw data leads to identical results. The full ANOVA tables can be found in Appendix S2.

Group	Target	Descriptive			Contrasts		
		<i>M</i>	95% CI	<i>SD</i>	<i>t</i> (70)	two-tailed <i>p</i>	η_p^2
preschoolers							
	<i>congruent</i>	4.31	[3.77; 4.85]	1.01	1.40	.167	.027
	<i>incongruent</i>	3.56	[2.63; 4.50]	1.75			
2 nd -graders							
	<i>congruent</i>	4.50	[4.16; 4.84]	0.63	2.54	.013	.084
	<i>incongruent</i>	3.69	[3.11; 4.26]	1.08			
6 th -graders							
	<i>congruent</i>	4.44	[4.05; 4.83]	0.73	3.54	.001	.152
	<i>incongruent</i>	3.25	[2.65; 3.85]	1.13			
9 th -graders							
	<i>congruent</i>	3.38	[2.86; 3.89]	0.96	1.71	.090	.040
	<i>incongruent</i>	4.00	[3.72; 4.28]	0.52			
undergraduates							
	<i>congruent</i>	3.94	[3.58; 4.30]	0.68	< 1		.006
	<i>incongruent</i>	3.75	[3.39; 4.11]	0.68			

Table 20: Descriptive statistics of the social contact measure (means, 95% confidence intervals, and standard deviations) and test statistics with respective p-values and effect sizes for the contrasts between targets of Study 5

The type of target produced a significant effect, $F(1, 70) = 8.18$, $p = .006$, $\eta_p^2 = .105$, with the congruent target being generally preferred for social contact over the incongruent target, qualified by an interaction with grade-level, $F(4, 70) = 4.03$, $p = .005$, $\eta_p^2 = .187$, which suggests that the extent of this preference was not constant across grade-levels. The contrast analysis, whose results are inscribed in the right pane of Table 20, attests that the preference for social contact with the congruent target was significant only for the second-grade, $t(70) = 2.54$, $p = .013$, $\eta_p^2 = .084$, and the sixth-grade, $t(70) = 3.54$, $p = .001$, $\eta_p^2 = .152$. In the ninth-grade there was a reverse tendency for preferring social contact with the incongruent target, which was marginally significant, $t(70) = 1.71$, $p = .090$, $\eta_p^2 = .040$.

The previously described results do not replicate the results obtained with the same measure in Study 4, where the difference between targets was more stable across grade-levels. However, the significant age-related linear trend in the perceived willingness to interact with the congruent target, observed in the previous study, was replicated, $t(70) = 3.07$, $p = .003$, $\eta_p^2 = .119$, along with the absence of such a linear trend for the incongruent target, $t(70) < 1$.

The undergraduate sample of the present study contained only one male participant, conversely to all other grade-levels where male and female participants were equally represented. For this reason, all variance analyses including *gender* as a factor were

performed excluding the undergraduate group. For the social contact measure, the *gender* factor did not produce any statistically significant effects or interactions.

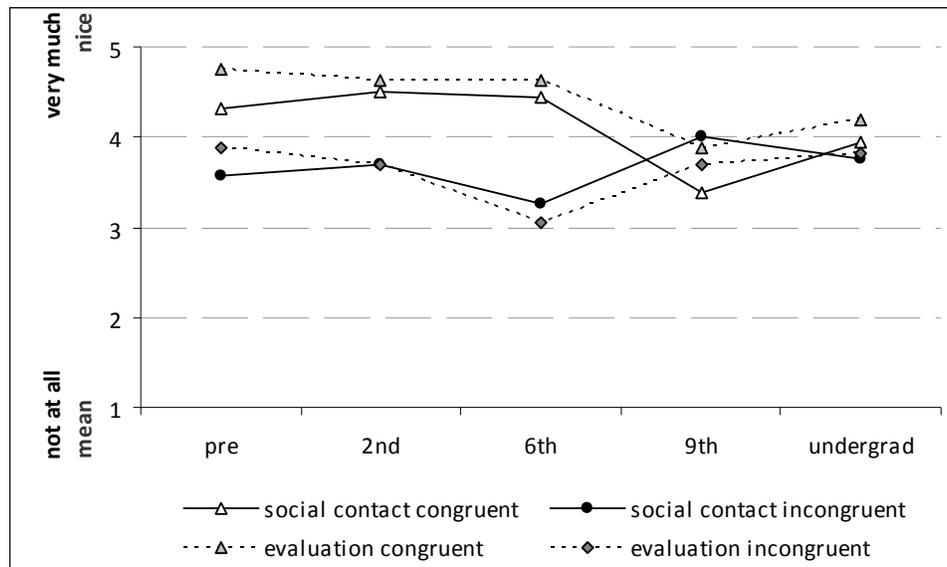


Figure 9: Ratings of the social contact measure (full lines) and evaluative measure (dotted lines) for each grade-level and target in Study 5

Evaluative ratings

Some statistics concerning the extent to which differently-aged participants perceived the congruent and incongruent targets as *mean* or *nice* persons are presented in Table 21. As in Study 4, the average evaluative ratings (see dotted lines of Figure 9) lie rather close to the average social contact ratings (i.e., full lines). The analyses of the evaluative ratings were conducted under a 5 (grade-level) \times 2 (order) \times 2 (target) repeated measures ANOVA with between-subjects factors model. Before analyses, the data were transformed into ranks because variances of the ratings for the congruent target were not homogeneous.¹¹⁵

¹¹⁵ See Appendix S3 for the Levene's tests per target and for the ANOVA tables with the raw and rank-transformed data. The analyses performed with the raw data lead to similar results, with the exception that the grade-level main effect did not attain statistical significance.

Group	Target	Descriptive			Contrasts		
		<i>M</i>	95% CI	<i>SD</i>	<i>t</i> (70)	two-tailed <i>p</i>	η_p^2
preschoolers							
	<i>congruent</i>	4.75	[4.44; 5.06]	0.58	2.91	.005	.108
	<i>incongruent</i>	3.88	[3.18; 4.57]	1.31			
2 nd -graders							
	<i>congruent</i>	4.63	[4.36; 4.89]	0.50	3.55	.001	.152
	<i>incongruent</i>	3.69	[3.18; 4.19]	0.95			
6 th -graders							
	<i>congruent</i>	4.63	[4.36; 4.89]	0.50	5.45	< .001	.298
	<i>incongruent</i>	3.06	[2.57; 3.56]	0.93			
9 th -graders							
	<i>congruent</i>	3.88	[3.36; 4.39]	0.96	< 1		.007
	<i>incongruent</i>	3.68	[3.18; 4.19]	0.95			
undergraduates							
	<i>congruent</i>	4.19	[3.84; 4.54]	0.66	1.39	.169	.027
	<i>incongruent</i>	3.75	[3.41; 4.21]	0.75			

Table 21: Descriptive statistics of the evaluative ratings (means, 95% confidence intervals, and standard deviations) and test statistics with respective *p*-values and effect sizes for the contrasts between targets of Study 5

The *grade-level* factor produced a significant effect, $F(4, 70) = 2.59, p = .044, \eta_p^2 = .129$, with more positive ratings being attributed by younger children. The correspondent linear trend was also significant, $t(70) = 2.68, p = .009, \eta_p^2 = .092$, indicating that the evaluations of the targets became linearly less positive as grade-level increased. The presentation order of the congruent and incongruent targets did not affect the evaluations nor interacted with other factors.

Overall, the congruent target was perceived as being a nicer person than the incongruent target, $F(1, 70) = 39.30, p < .001, \eta_p^2 = .571$, but a significant interaction with the grade-level qualified this effect, $F(4, 70) = 3.48, p = .012, \eta_p^2 = .166$. The contrast analysis revealed that only preschoolers, second-, and sixth-graders evaluated the congruent target more positively than the incongruent target (see *t*-values, associated *p*-values, and effect sizes in Table 21). The differences in the evaluations of both targets were not significant for ninth-graders or undergraduates. Moreover, an age-related linear trend could be identified in the evaluations of the congruent target, $t(70) = 3.56, p = .001, \eta_p^2 = .153$, but not of the incongruent target, $t(70) < 1$. These results are a bit surprising in the sense that they are not consistent with the pre-test results, where only the sixth-graders evaluated the targets differently. However, it must be taken into account that in the present study participants had already answered the cognitive contact and the social contact measures before and may thus

be somehow justifying their previous responses or simply perceiving the targets differently after having decided how much they would like to listen to a story about or to play with each one of the targets.

As explained in the previous section, in order to include *gender* as a factor in the ANOVA, the undergraduate sample had to be excluded. A 4 (grade-level) \times 2 (gender) \times 2 (target) repeated measures ANOVA, conducted upon the rank-transformed data, revealed that gender interacted with the type of target in the evaluation ratings, $F(1, 56) = 12.61, p = .001, \eta_p^2 = .184$.¹¹⁶ Namely, male participants rated the congruent target more positively, but the incongruent target more negatively, than female participants. However, since this tendency was constant across grade-levels, and participants' gender was paired with the gender of the version, this statistical result will not be further interpreted.

Association between dependent measures

As in the previous study, the correlations between dependent measures were calculated for the total sample and for each grade-level separately.¹¹⁷ The pattern of correlations replicates extensively the pattern obtained in Study 4. More specifically, the predicted willingness to interact with each target was generally correlated with the evaluation of the correspondent target (incongruent target: $r(78) = .66, p < .001$; congruent target: $r(78) = .39, p < .001$), but not with the other target's evaluation or predicted willingness for social contact. Consistently with the previous study's results, the correlation between the social contact and the evaluation measures for the incongruent target was positive in all grade-levels, but particularly expressive for preschoolers, $r(14) = .76, p = .001$, second-graders, $r(14) = .88, p < .001$, and ninth-graders, $r(14) = .55, p = .029$. On the other hand, the analogous correlation for the congruent target was less consistent across grade-levels, ranging from a large value among sixth-graders, $r(14) = .66, p = .005$, to a null correlation among second-graders.

The most substantial difference in the pattern of correlations, relatively to the previous study, is that there were no significant correlations between the cognitive contact measure and the other measures in the analysis per grade-level. There was an overall tendency for those who chose to listen to a story about the incongruent target to be less willing to interact with the congruent target, $r(78) = .40, p < .001$, and to judge the congruent target less positively, $r(78) = .41, p < .001$. However, these overall correlations have only a limited interest and, in the present case, they may merely reflect the already reported age-related linear trends for the

¹¹⁶ The full ANOVA table can be found in Appendix S3.

¹¹⁷ A table containing all coefficients can be found in Appendix S4.

increase of choices of the incongruent target in the cognitive contact measure and the decrease of the ratings for the congruent target in the social contact and evaluation measures. Again, it should be reminded that the cognitive contact measure resulted in uneven sample splits, which influences the magnitude of the correlation coefficients. In fact, in the current study, there was an extreme case of uneven sample size split in the ninth-graders' group, where all participants chose the incongruent target for cognitive contact, precluding thus the possibility of calculating the correlation coefficients.

Behaviour explanations

The explanations for the target-children's behaviour offered by the participants were coded as denying given information, as referring to specific situational aspects, to dispositional factors of the target-child, or as non-responses. As in the case of the studies presented in the first part of this dissertation, all answers were coded in at least one of these categories (i.e., the category system was exhaustive but not mutually exclusive, when answers were treated as units). The *premise denial* category gathered all statements that implied either that the target-child did not like her/his friend a lot (e.g., "because maybe he doesn't like his best friend that much"), that they were not best friends (e.g., "because he isn't that much of a friend of his"), or that the target-child did not choose where to sit (e.g., "because sometimes he doesn't have a place to sit next to his friend"), for these types of statements contradict the information given in the presentation of the targets. The *situational* category included references to circumstantial aspects, usually circumscribed in time and space. The most frequent statements of this type pointed at momentary disagreements in the friendship relation (e.g., "because sometimes they get upset") or at the link between sitting close to a friend and paying less attention to class (e.g., "sometimes she moves away so that she can be more attentive"). The *dispositional* category comprised references to more stable factors within the target-child, including attitudes towards the friend (e.g., "because she likes her friend a lot"), attitudes towards others (e.g., "maybe she's a person who gets along with everybody"), and personality traits (e.g., "because maybe she's a more sociable person"). Finally, answers that did not imply possible causes but were mere reformulations of the given description were included in the *non-response* category (e.g., "he wanted to sit in another chair").¹¹⁸

The majority of the explanations (91%) could be coded exclusively in one category by the two independent judges. For those explanations the Cohen's kappa coefficient was $\kappa =$

¹¹⁸ See Appendix S5 for a list of the verbatim answers.

.78, which indicates a good level of inter-judges agreement. Regarding the remaining 9% of the explanations, which were coded in more than one category by one or both of the judges, there was an agreement in 75% of the cases. The codifications offered by a third independent judge in the disagreements cases were used as tiebreakers. The final frequencies of occurrence for each category per target-type and grade-level are summarized in Table 22.

Target	Premise denial	Situational	Dispositional	Non-response
congruent				
<i>preschoolers</i>	0	0	14	2
<i>2nd-graders</i>	0	0	16	0
<i>6th-graders</i>	0	0	16	0
<i>9th-graders</i>	0	1	16	0
<i>undergraduates</i>	0	3	15	0
incongruent				
<i>preschoolers</i>	8	2	6	0
<i>2nd-graders</i>	4	5	6	1
<i>6th-graders</i>	4	5	7	0
<i>9th-graders</i>	1	3	15	0
<i>undergraduates</i>	0	8	12	0

Table 22: Frequencies of strategies (premise denial, situational, dispositional) and of non-responses in the behavioural explanations given by participants of Study 5.

Note. All n=16.

From the observation of Table 22 it can be concluded that the type of explanations for the behaviour of the congruent target did not seem to change according to grade-level, namely the vast majority of the participants pointed at a dispositional explanation. This does not mean, however, that the content of the explanations was identical across grade-levels. For example, while younger children tended to equate sitting next to the friend with a positive attitude towards that friend, older participants sometimes inferred more negative characteristics, such as being more dependent or less sociable.

In contrast to the explanations provided for the congruent behaviour, the way participants explained the incongruent behaviour revealed an age-related shift of strategies. The modal strategy for preschoolers involved contradicting a bit the previously given information, so that the incongruent behaviour would become more consistent with the dispositional characteristics of the target-child. A frequent idea was that the incongruent

target liked his/her friend less than the congruent target did, although both targets were presented as liking their best friends a lot. This strategy was still visibly used by second- and sixth-graders, but decreased in frequency with grade-level. The dispositional category was also frequently used by preschoolers, some of which inferred that the target-child had other friends besides the best friend (an explanation that continued to be quite frequent across grade-levels). Other preschoolers mentioned vaguely that the target behaved as s/he did because s/he *felt like it* or wanted to. Although these instances were coded in the dispositional category, it is not clear whether the participants were inclined to think that “feeling like it” is more situationally- or dispositionally-driven.

Second-graders evoked more often than preschoolers situational factors as explanations for the incongruent target’s behaviour. This type of explanation does not alter the given dispositional information about the target, but does not also really integrate the incongruent information in a unified impression. A situation commonly suggested was a disagreement between the two friends. This strategy continued to be used across grade-levels. Both second- and sixth-graders’ explanations were fairly distributed across categories.

A more integrated strategy, where participants called on other dispositional factors in order to explain the incongruent behaviour, was most commonly used by ninth-graders and undergraduates. The participants in these two groups frequently inferred a characteristic from the incongruent behaviour that would not directly oppose the previously stated information, but rather provide a more faceted and complex personality impression of the target. Some of these participants suggested, for example, that the incongruent target was quite sociable, thus having to distribute his/her time by more than one friend, or independent, while some others suggested that s/he was more instrumental and worried with impression management.

At this point two cautionary remarks should, however, be made regarding the behaviour explanations. One of those remarks is that participants provided these explanations after they had responded to all other dependent measures. Hence, at least in some cases, the participants may have been justifying their own previous responses, as for example how much they predicted they would like to play with each one of the targets, rather than providing their prioristic interpretations of the behaviour of the two target-children. The second remark is that the categories system that was created to codify the present behaviour explanations, being so abstract, may falsely induce the idea that the described strategies are fairly generalisable. However, the analysed explanations were obtained with a very specific and restricted behavioural material, and the system may be poorly adequate to categorize explanatory strategies for other kinds of incongruent behaviours, for example.

3.3.2.C) DISCUSSION

The current results generally support the conclusions drawn in the previous study by replicating the age-related changes from second-graders' avoidance of going on thinking about the incongruent target until ninth-graders' preference for knowing more about this same target. This replication is particularly meaningful since the type of material used in both studies differed substantially. Moreover, by greatly reducing the eventual role played by valence differences, the present study could offer additional insights on younger children's responses to incongruency in impression formation settings. Namely, there were very few signs in this study that preschoolers would prefer to actively avoid incongruent information. Another extension provided by the present study were the undergraduates' responses, which did not differ substantially from the ninth-graders' ones, thus suggesting that marked qualitative changes between adolescence and young adulthood in the processing of incongruent information in impression formation settings are rather unlikely. The results obtained for each grade-level will be discussed in greater detail in the following paragraphs.

Preschoolers chose almost as frequently to listen to a story about a child who sometimes sits next to his/her best friend and sometimes does not as a story about another child who always sits next to his/her best friend. These younger participants' ratings of how much they would like to play with each one of the target-children did not differ statistically as well. Moreover, when asked about why the incongruent target would sometimes sit next to his/her friend and sometimes not, preschoolers frequently reported an inference that openly contradicted prior information. All these results are consistent with the idea that at an initial stage incongruent information about one person may not be detected or conceived as incongruent, just like the preschoolers' insensitivity to contradiction discussed by Piaget (1924) or the novices' undifferentiation between congruent and incongruent information at some expertise domains (e.g., Chase & Simon, 1973; Fiske et al., 1983). The different, and sometimes opposing, inferences drawn from the incoming information seemed more to be momentarily substituted by each other or to coexist *side by side*, than to clash with each other or to be subjected to unifying pressures. One of the results obtained in the current study, however, does not clearly fit this image, namely the fact that preschoolers evaluated the incongruent target as a less nice person than the congruent target. Still, in a pre-test, using the same scale, both targets had been evaluated similarly, which suggests that the difference of the targets' evaluations in the present study derived mainly from the processes involved in

responding to the other dependent measures. It should also be noted that it was in the preschoolers' group that the results in the cognitive contact measure differed more markedly between studies. This inconsistency may, however, be easily interpreted as valence-related. While preschoolers plausibly already use valence, or particularly negative information, as a diagnostic cue in impression formation settings, they seemingly do not use incongruity as diagnostic information. In more concrete terms, the possibility that was raised in the discussion of the previous study, namely that preschoolers may have rejected the incongruent target because of the negative behaviour, and not because of the incongruity itself, gained additional support with the present results.

The second-graders' responses, in contrast with preschoolers' ones, are very much consistent with the idea that these social perceivers try to avoid being confronted with incongruent information, plausibly because they have not yet developed the necessary cognitive abilities (or resources) to deal with this type of information. Second-graders consistently chose to listen to a story about the congruent target-child, they predicted that they would prefer to play with that target, and evaluated him/her more positively. These participants' explanations of the incongruent target's behaviour focused usually in the situation as a primary determinant of behaviour, and more rarely achieved dispositional characterizations that did not contradict previously given information.

The sixth-graders' responses were quite similar to the second-graders' ones regarding the predicted willingness to interact with each one of the target-children and their evaluation (i.e., the congruent target was rated more positively in both measures). However, in the focal measure of willingness for cognitive contact, the two groups clearly differed. Sixth-graders chose to listen to a story about the congruent or the incongruent target indistinctly. The idea that the absence of a clear preference reflects a transitional position between preferring not to know more about the incongruent target and its opposite gets additional support from the sixth-graders' choices permeability to extraneous factors (i.e., order of target presentation) and from the variety of explanation types for the incongruent behaviour, as well.

Between the sixth- and the ninth-grade there were visible changes in all dependent measures. The adolescents in this study preferred unanimously to listen to a story about the incongruent target and provided explanations for his/her behaviour that fitted a unified personality impression. Moreover, ninth-graders tended to report that they would prefer to socially interact with the incongruent target and evaluated both targets as equally nice. All these results suggest that adolescents are much more comfortable with processing incongruent information in impression formation settings than children, which in turn corroborates the

idea that this type of processing requires more cognitive resources and/or more complex cognitive abilities.

The undergraduates' responses were fairly similar to the ones provided by ninth-graders, conferring confidence that the aforementioned changes were not peculiar to the ninth-graders' group of participants, but more likely reflect a developmental product that persists through adulthood (or at least until young adulthood).

A result that was constant across the current and the previous study, whenever the congruent and the incongruent targets were rated independently, was that the congruent target would be rated less positively with increasing age, while there was no such linear relation between ratings and age for the incongruent target. Although the social contact and the evaluation measures were not the focal interest of this set of studies, the just described linear trends also conform fairly well to the idea that across the ontogeny there are non-linear changes in the way incongruent information about someone is processed. If these changes did not occur, a more linear trend in the ratings was to be expected, which would plausibly reflect, as in the case of the congruent target, a decrease of the positivity bias, or of the optimism, in the evaluation of others, or simply a difference in the way the rating scales are used (e.g., a departure from the extreme values). However, if the incongruency moves from not being detected, to be actively avoided, and then accepted but not necessarily conceived as more positive, it is natural that no linear relation between ratings and age can be found.

Another potentially interesting aspect is that the results pattern of the cognitive contact measure differed less, in the qualitative sense, between studies than the pattern of the social contact measure.¹¹⁹ This result corroborates the idea that the focal measure taps more clearly into the effects of the congruency variable, while the other seems to be more affected by the valence variable. However, one should not generalize the results obtained in these measures to conclude, for example, that older social perceivers do not penalize descriptive incongruency (e.g., behavioural inconsistency) in their social interactions, since this result may have been totally dependent on the attributions that participants made with this particular material.

Before moving on to the next study, a critical remark on how the results of the focal measure (i.e., cognitive contact measure) have been presented and discussed must be made. Usually the results have been interpreted focusing on the incongruent target, and thus percentages of choices favouring the congruent target have been interpreted as an avoidance

¹¹⁹ Please recall that in the previous study the congruent target was preferred for social contact across all grade-levels, while in the present study such preference was statistically significant only for second- and sixth-graders.

tendency for thinking about the incongruent target, and percentages favouring the incongruent target have been interpreted as a preference for thinking about this target. However, these data could be interpreted in a complementary way (i.e., as an approach tendency towards the congruent target followed by an avoidance tendency towards the same target) or in a mixed way (i.e., an ontogenetically earlier preference for the congruent target and a later preference for the incongruent target). The present data are insufficient to distinguish between these interpretations. There are, however, two main, and interrelated, reasons that underlie the way the results were described and interpreted. The first one is the already mentioned adopted perspective. The aim of the present set of studies was the exploration of responses to incongruency, not congruency, and thus the readings were made in relation to the incongruent target. The second reason is that there are fewer reasons to hypothesise age-related changes in the way congruent information is processed in impression formation than for incongruent information. The behaviour explanations provided by differently-aged participants in the present study, for example, support this idea. While the explanations for the congruent target's behaviour were fairly similar across grade-levels, the explanations for the incongruent behaviour differed substantially. An interesting follow-up study, although not accomplished in the present research project, would thus try to establish whether participants chose one of the stories because they preferred to know more about that target, preferred not knowing more about the other target, or both.

Summing up, the results of this set of two studies are quite consistent with each other and there are plausible interpretations for the cases where the results were different, which enhances confidence on the drawn conclusions. However, in both studies the same focal measure was used, namely the participants' willingness to know more about a congruent or an incongruent target, and, as such, results may have been particular to this task. Thus, in order to pursue the exploration of children's and adolescents' response to incongruency in impression formation settings, another study was designed including a different focal measure and a different type of material (i.e., traits instead of behaviours).

3.3.3. STUDY 6 – THE SMART AND DUMB KID

The present study was inspired by Asch and Zukier's study (1984), which explored the narrative modes that social perceivers use to attain a unified personality impression of someone who is described in incongruent terms. As mentioned earlier [SEE SECTION 3.2.3.B], the

adult participants in this study resolved with apparent ease a number of incongruencies and succeeded at describing a coherent impression. However, in a small minority of the cases, participants reported not being able to conceive a person who could be described simultaneously by a given pair of traits. Studies 4 and 5 of the present dissertation support the idea that children (especially younger children) may lack the cognitive resources or abilities to make sense of incongruent information in a unified personality impression. Hence, before asking children and adolescents to resolve some given incongruency, the present study tried to capture whether they could conceive of a person described by that incongruent information. This new measure of participants' willingness to accept that a person can be described in incongruent terms does not require a choice between a congruent and an incongruent target and is one of the major differences of the present study relatively to the two previous ones.

Moreover, while in Studies 4 and 5 the target-persons were described in behavioural terms, the targets of the present study were described by traits. Mainly due to young children's restricted trait vocabulary, the traits selected as material for the present study were highly valenced and blatantly incongruent with each other. This study represented, thus, predictably a very hard challenge for the participants, in the sense that the incongruency was both evaluative and descriptive, which Hampson (1998) has shown to be the most difficult type of incongruency to resolve, and was more extreme than merely a trait not implicating the other, as some of the instances in Asch and Zukier's study (1984). Nevertheless, studying children's and adolescents' responses to incongruent traits (and not just behaviours) seemed to be a desirable extension for the exploration of responses to incongruency.

OVERVIEW

In this study participants had to decide whether some target-persons, described simultaneously by two congruent (e.g., sweet and polite) or incongruent (e.g., smart and dumb) attributes, existed in reality. If participants answered affirmatively, they were asked to explain why the targets could be described by that pair of traits and how many more people could be described that way. All participants estimated how many people could be described by each one of the traits individually.

The main idea underlying the present study is that if it is hard for a social perceiver to cognitively conceive of someone who can be simultaneously described by incongruent information, then s/he will not likely affirm that such a person exists. Therefore, younger children were expected to reject the existence of the targets described by incongruent traits,

while adolescents were expected to accept their existence. Because all materials were valenced, it was predicted that the youngest participants (i.e., preschoolers) would show high rejection rates, as in Study 4, and not a more balanced rate between acceptances and rejections, as in Study 5. Moreover, participants of all grade-levels were expected to accept the existence of people described by congruent traits to a higher extent than of people described by incongruent traits.

3.3.3.A) METHOD

Participants

Participants in this study were 23 preschoolers, 16 second-graders, 10 sixth-graders, and 10 ninth-graders. Some descriptive data concerning age and gender of the participants can be found in Table 23. The samples were drawn from the same context as in the previous studies (i.e., a medium-high socio-economical status private school).

Grade-level	n	Age			Gender	
		<i>M</i>	<i>SD</i>	[<i>min</i> ; <i>max</i>]	males	females
preschool	23	5y 10m	4m	[5y 4m; 6y 4m]	8 (35%)	15 (65%)
second	16	7y 11m	3m	[7y 5m; 8y 4m]	9 (56%)	7 (44%)
sixth	10	11y 8m	7m	[10y 4m; 12y 4m]	5 (50%)	5 (50%)
ninth	10	14y 11m	4m	[14y 5m; 15y 4m]	5 (50%)	5 (50%)

Table 23: Descriptive statistics concerning age (mean, standard deviation, minimum and maximum values) and gender (frequencies and percentages) of Study 6 participants

Note. y = years, m = months.

Material

Seven pairs of traits were selected to be used in the present study. The main criterion that underlay this selection was preschoolers' understanding of the meaning of the traits. As part of a more comprehensive study, which aimed at collecting Portuguese trait terms that children use and understand in descriptions of others, and which will not be reported in the present dissertation, it was established that all grade-levels understood adequately the

meaning of the 14 traits in question.¹²⁰ A subsequent preoccupation was that the selected trait pairs would cover diverse areas potentially important for impression formation and that some of the pairs would be congruent for comparison purposes, although the interest lay especially in the incongruent trait pairs. Hence, the following trait pairs were used: (1) congruent positive – *sweet* and *polite*; (2) congruent negative – *selfish* and *rude*; (3) incongruent intellectual – *smart* and *dumb*; (4) incongruent social – *good* and *bad*;¹²¹ (5) incongruent moral – *says truths* and *is a liar*;¹²² (6) incongruent emotional – *happy* and *sad*; (7) incongruent physical – *clean* and *dirty*. The trait pairs were organised in four versions of the material. The differences between versions consisted in the presentation order of the trait pairs (the congruent pairs occupied always the third and sixth positions) and in the presentation order of the traits within a pair (e.g., in two of the versions the intellectual pair was *smart and dumb*, while in the other two the same pair was *dumb and smart*).

Procedure

The initial parts of the procedure and the experimental setting of the present study shared a lot of similarities with the previous studies (e.g., individual sessions, responses annotated by experimenter). After checking the participant's assent to participate and collecting some demographic data, the experimenter explained that she was going to tell the participant about some children (boys and girls for adolescent participants), and that the participant should try to find out whether this children really existed or not. For the first pair of traits (e.g., smart and dumb) the experimenter would say "I'm thinking of a kid who is smart and dumb at the same time" and then present all dependent measures regarding that pair of traits. After the participant responded to the last dependent measure, the experimenter would present the second trait pair using the same formulation, move on to the dependent measures, and so forth until the seven trait pairs were completed. At the end, participants were thanked for their collaboration and dismissed.

¹²⁰ Namely, the majority of the participants in the more comprehensive study was able to produce the trait label (e.g., selfish) after listening to a trait-implicative behaviour (e.g., never shares his toys) and the prompt "This kid is really..."

¹²¹ This pair could be referred as merely evaluative, but it will be considered as an exemplar of the social sphere, since young children frequently interpret *good* as doing nice things to others and *bad* as doing mean things to others.

¹²² This was the only pair where a behaviour rather than the trait label was used, because the labels *truthful* or *honest* were not spontaneously used by young Portuguese children.

Design

4 *grade-levels* (preschool vs. 2nd-grade vs. 6th-grade vs. 9th-grade) × 4 *versions* (order 1 vs. order 2 vs. order 3 vs. order 4) × 7 *trait pairs* (1 congruent positive vs. 1 congruent negative vs. 5 incongruent).

Dependent Measures

Acceptance of co-occurrence. The focal measure of the present study aimed at assessing the participants' willingness to accept that two traits can co-occur in a real person's personality. Thus, for each trait pair, the experimenter told the participants she was thinking of a child who was one of the traits (e.g., smart) and the other trait (e.g., dumb) at the same time. Participants were then asked whether they thought that this child existed in reality or not.¹²³

Explanations for co-occurrence. If participants responded affirmatively in the previous measure, they were then asked to explain how the two traits could describe the same person. This measure was adapted from Asch & Zukier's task (1984), but because young children tend to have difficulty with open-ended, introspection-oriented questions, the question was phrased as "Why do you think other people say this kid is smart and dumb [trait pair] at the same time?". This measure aimed at exploring the participants' psychological strategies to deal with two, often opposing, pieces of information about someone.

Frequency estimates of co-occurrence. Again, if participants accepted the co-occurrence of traits as real (i.e., answered *yes* in the first measure), they would be asked to estimate the amount of people who could be described by that pair of traits in a 4-point pictorial scale. The points were labelled *very few*, *some*, *many*, and *lots*, and the pictorial elements varied between a single silhouette and a group of many silhouettes. The value zero was automatically assigned to those instances where participants answered *no* in the acceptance of co-occurrence measure. All other instances were coded with values between 1 and 4, corresponding to the 4 points of scale. This measure was included in order to facilitate the interpretation of the results obtained in the acceptance of co-occurrence measure. Namely, the fact that a participant is willing to accept the existence of a person described by a pair of traits may only indicate that s/he conceives the co-occurrence as a possibility but not as a prevalent reality.

¹²³ An exemplar of the coding sheets can be found in Appendix T.

Frequency estimates of individual traits. Independently of the previous answers all participants were asked to estimate the amount of people who could be described by each one of the traits in the pair, using the just described 4-point scale. This measure intended to detect eventual cases where participants rejected the real existence of a person described by a pair of traits, not because they doubted the possibility of co-occurrence, but because they doubted that a particular trait was present in the population at all.

3.3.3.B) RESULTS

Acceptance of co-occurrence

Figure 10 depicts the percentage of participants at each grade-level who asserted that a person described by each one of the pair of traits existed in reality.¹²⁴

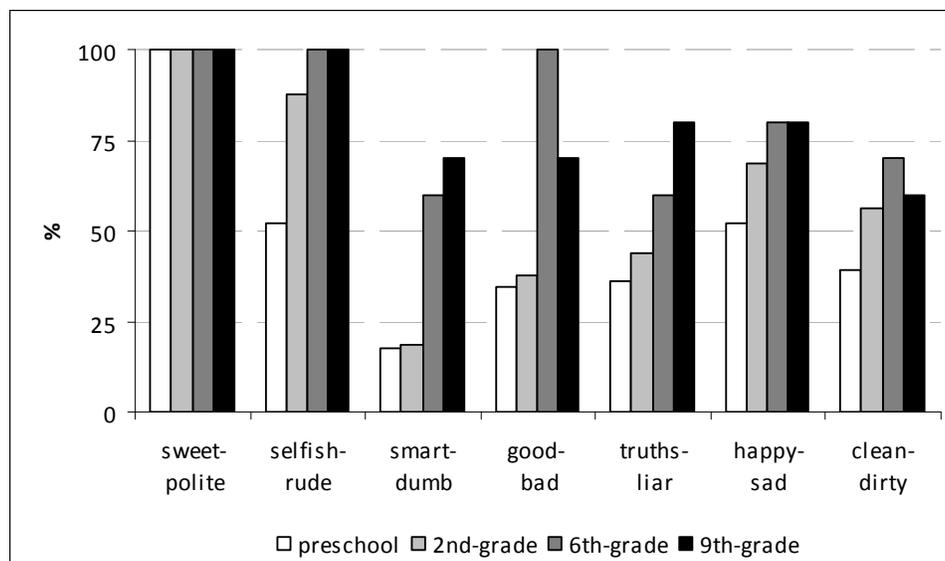


Figure 10: Percentages of co-occurrence acceptance by grade-level for each trait pair in Study 6

The first set of bars in the figure concerns the congruent pair where both traits were positive (i.e., sweet and polite). The possibility of co-occurrence of these traits was accepted by all participants at all grade-levels, suggesting that differently-aged social perceivers can easily conceive of someone who is described by multiple positive traits. The second set of bars depicts the acceptance percentages for the negative congruent pair of traits (i.e., selfish

¹²⁴ For raw frequencies please refer to Table U1.

and rude). It was expected that both congruent pairs would attain higher levels of acceptance than the incongruent pairs. While this expectation was generally corroborated by the data, about half of the preschoolers' sample (48%) rejected the existence of someone described by the two negative traits. This result is particularly important for the interpretation of the results for the remaining pairs of incongruent traits, since it suggests that a substantial amount of preschoolers may reject the co-occurrence of incongruent traits as real, not because the traits are incongruent, but because one of the traits is negative. Conversely, since the other grade-levels accepted the co-occurrence of the congruent traits almost unanimously (the exception are 2nd-graders with 88% of acceptance of the negative pair), the differential results for the incongruent pairs can be more clearly interpreted in terms of the incongruency, not the negativity, factor.

The procedure proposed by Everitt (1977) to extract the linear component out of the overall chi-square statistic, which was used in the two previous studies, was applied to the present data as well. Namely, the overall association between grade-level and co-occurrence acceptance was calculated, then the linear component of the association was determined, and finally the statistical significance of the residual component was examined. The values obtained by this procedure for each one of the trait pairs are inscribed in Table 24.

Trait pair	co-occurrence acceptance				overall	linear component	residual
	grade	pre	2 nd	6 th			
<i>n</i>	23	16	10	10	$\chi^2(3, N = 59)$	$\chi^2(1, N = 59)$	$\chi^2(2, N = 59)$
sweet-polite	23	16	10	10			
selfish-rude	12	14	10	10	15.41 <i>p</i> =.002	12.69 <i>p</i> <.001	2.72 <i>p</i> =.257
smart-dumb	4	3	6	7	13.29 <i>p</i> =.004	11.48 <i>p</i> =.001	1.81 <i>p</i> =.405
good-bad	8	6	10	7	14.62 <i>p</i> =.002	8.44 <i>p</i> =.004	6.18 <i>p</i> =.046
truths-liar	6	7	6	8	9.15 <i>p</i> =.027	9.14 <i>p</i> =.002	0.01 <i>p</i> =.994
happy-sad	12	11	8	8	3.77 <i>p</i> =.288	3.36 <i>p</i> =.067	0.40 <i>p</i> =.817
clean-dirty	9	9	7	6	3.19 <i>p</i> =.363	2.22 <i>p</i> =.136	0.97 <i>p</i> =.615

Table 24: Frequencies of co-occurrence acceptance per grade-level and test statistics with respective p-values for the overall, linear, and residual association between co-occurrence acceptance and grade-level in Study 6

A clear age-related linear trend in the acceptance of the co-occurrence of incongruent traits was obtained for two of the pairs, namely the ones in the intellectual sphere (i.e., smart and dumb) and in the moral sphere (i.e., says truths and is a liar). In both cases the linear component was highly significant (smart-dumb: $\chi^2(1, N = 59) = 11.48, p = .001, r^2 = .195$; truths-liar: $\chi^2(1, N = 59) = 9.14; p = .002, r^2 = .155$), while the residual amount of association was non-significant. The two younger groups (i.e., preschoolers and 2nd-graders) were particularly sceptical about the existence of someone that could be described as smart and dumb simultaneously. The majority of the oldest participants (i.e., 9th-graders), on the other hand, accepted the existence of both a smart and dumb person and of someone who tells truths and is a liar.

A similar age-related linear trend emerged for the pair of traits in the social sphere (i.e., good and bad), $\chi^2(1, N = 59) = 8.44, p = .004, r^2 = .143$, with the majority of younger children doubting the existence of someone who is good and bad, and the majority of adolescents affirming this person as real. However, in this case the residual component of the overall association also attained statistical significance, $\chi^2(2, N = 59) = 6.18, p = .046$, attesting that some of the differences between grade-levels do not fit this linear pattern. In

fact, the group of sixth-graders unanimously admitted the existence of a good and bad person, thus deviating from an intermediate position.

The two remaining incongruent pairs of traits did not reveal reliable associations between co-occurrence acceptance and grade-level, particularly the pair in the more physical sphere (i.e., clean and dirty). For the pair in the emotional sphere (i.e., happy and sad) the age-related linear trend in the acceptance of co-occurrence was marginally significant, $\chi^2(1, N = 59) = 3.36, p = .067, r^2 = .057$. In both cases the data pattern seems to suggest, rather than the age-related linear trend, that the preschoolers' responses were different from the other three grade-levels' responses.

Frequency estimates of co-occurrence

As mentioned earlier, those participants who said that the person described by any pair of traits was real were asked to estimate the prevalence of people who could be described similarly.¹²⁵ If these participants accepted the co-occurrence of traits just because they were more able to conceive possibilities that go beyond the reality they know, rather than because they believed that real people can often be described by incongruent traits, then their frequency estimates should be rather low.

Some descriptive statistics concerning this measure are presented in Table 25 and plotted in Figure 11. Because the frequency estimates for all the incongruent trait pairs showed a similar pattern, and in order to facilitate representation and analysis, a compound value, namely the average, for the five incongruent pairs was calculated. The internal consistency of this compound of five items over all 59 participants given by the Cronbach's alpha was $\alpha=.76$, and would not be higher with the exclusion of any pair of traits.

¹²⁵ Please recall that in order to maintain the sample size constant across trait pairs, a null value (which would be equivalent to the qualitative response "none") was assigned to the frequency estimates of those participants who rejected the existence of a person described by the pair of traits.

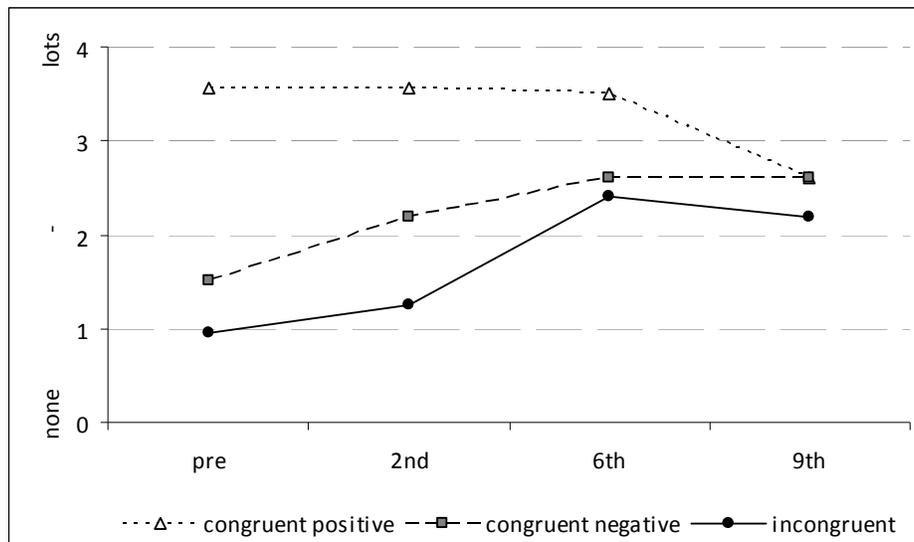


Figure 11: Estimates of the prevalence of people who can be described by the congruent and incongruent pairs of traits of Study 6

As shown by Figure 11, and more clearly by the 95% CI in Table 25 or the response distributions in Appendix U1, the older children and adolescents (i.e., 6th- and 9th-graders) did not estimate the co-occurrence of incongruent traits to be particularly rare in the population. Thus, it seems that these participants did not accept the occurrence of incongruity merely as a theoretical possibility, but they actually conceived it as an actual phenomenon.

The rank-transformed frequency estimates data were further analysed in a 4 (grade-level) \times 2 (gender) \times 3 (pair-type) repeated measures ANOVA with between-subjects factors. The rank-transformed data were preferred over the raw data because the variances concerning the estimates of the negative congruent pair were not homogeneous, Levene's $F(3, 55) = 8.37, p < .001$.¹²⁶ The version factor was excluded from the reported analyses since it did not produce any significant effect or interactions. On the other hand, the gender factor was kept in the analyses, although it was not a focal variable, for its main effect attained statistical significance, $F(1, 51) = 5.53, p = .023, \eta_p^2 = .098$, denoting that female participants gave in average higher frequency estimates than male participants. However, the gender factor did not interact with any other variable, and will thus not be further interpreted.

The overall frequency estimates differed across grade-levels, $F(3, 51) = 3.37, p = .025, \eta_p^2 = .165$, but an age-related linear trend, calculated via contrast analysis, was only marginally significant, $t(51) = 1.74, p = .088, \eta_p^2 = .056$. In fact, the grade-level effect was qualified by an interaction with the within-subjects type of pair factor, $F(6, 102) = 4.42, p =$

¹²⁶ See Appendix U1 for material related with the ANOVA assumptions and full ANOVA tables. The ANOVA conducted with the raw data produced identical results.

.001, $\eta_p^2 = .206$. When broken down per pair type, all three age-related linear trends were significant. While the frequency estimates decreased linearly with grade-level for the positive congruent pair, $t(51) = 3.15$, $p = .003$, $\eta_p^2 = .163$, the frequency estimates both for the negative congruent pair, $t(51) = 2.39$, $p = .021$, $\eta_p^2 = .100$, and for the compound of incongruent pairs, $t(51) = 3.15$, $p = .003$, $\eta_p^2 = .194$, increased linearly with grade-level. Concerning the congruent pairs, these trends may be a reflection of the aforementioned younger children's positivity bias. It could also be argued that the linear trend for the incongruent pairs of traits reflects exactly the same bias, namely that younger children estimate the amount of people who can be described by a pair of incongruent traits to be lower than the older participants do, because one of those traits is always negative. This argument, however, can be hardly applied to the second-graders' case, where they estimated the frequency of people who could be described by two negative traits to be higher than that of people described by one positive and one negative trait, $t(51) = 2.63$, $p = .011$, $\eta_p^2 = .119$.

Pairs	<i>n</i>	<i>M</i>	95% CI	<i>SD</i>	cong vs. incong		
					<i>t</i> (51)	two-tailed <i>p</i>	η_p^2
preschoolers	23						
<i>positive</i>		3.57	[3.22; 3.91]	0.79			
<i>negative</i>		1.52	[0.82; 2.22]	1.62	6.19	< .001	.429
<i>incongruent</i>		0.95	[0.55; 1.34]	0.91			
2 nd -graders	16						
<i>positive</i>		3.56	[3.17; 3.95]	0.73			
<i>negative</i>		2.19	[1.63; 2.75]	0.79	5.70	< .001	.389
<i>incongruent</i>		1.26	[0.65; 1.88]	1.15			
6 th -graders	10						
<i>positive</i>		3.50	[2.99; 4.01]	0.71			
<i>negative</i>		2.60	[2.10; 3.10]	0.70	1.98	.052	.072
<i>incongruent</i>		2.40	[1.59; 3.21]	1.14			
9 th -graders	10						
<i>positive</i>		2.60	[2.10; 3.10]	0.70			
<i>negative</i>		2.60	[2.00; 3.20]	0.84	1.37	.176	.036
<i>incongruent</i>		2.18	[1.65; 2.71]	0.74			

Table 25: Descriptive statistics of the frequency estimates for the co-occurrence of traits (means, 95% confidence intervals, and standard deviations) and test statistics with respective p-values and effect sizes for the contrasts between congruent and incongruent trait pairs in Study 6

As for the acceptance of co-occurrence measure, it was expected that the co-occurrence of the congruent traits would be considered more prevalent in the population than the co-occurrence of incongruent traits by those participants who would have difficulties in conceiving a unified impression out of incongruent information. The main effect produced by the type of pair factor, $F(6, 102) = 39.97, p < .001, \eta_p^2 = .439$, was analysed in more detail with contrast analysis. The test statistics, associated significance values, and effect sizes, of the comparisons between the two congruent pairs, on the one hand, and the compound of the five incongruent pairs, on the other hand, are presented in Table 25. As expected, preschoolers and second-graders estimated the co-occurrence of congruent pairs to be more frequent than the co-occurrence of incongruent traits. Sixth-graders showed a similar tendency, which was marginally significant, and only ninth-graders estimated both congruent and incongruent trait pairs to be similarly prevalent.

Frequency estimates of individual traits

In a similar vein to the previous measure, participants were asked to estimate the frequency of people who could be described by any individual trait, in order to check whether the rejection of the co-occurrence of a pair of traits as real could be due to the rejection of the prevalence in the population of at least one of the traits in the pair. Again, for ease of representation and analysis, and since all positive and all negative traits shared the same patterns of results, the traits were grouped by valence. The internal consistency of the compound of the seven positive traits, as given by Cronbach's alpha, was $\alpha=.79$ and would not benefit from the exclusion of any trait. The analogous value for the compound of the seven negative traits was $\alpha=.74$ and could be improved to $\alpha=.77$ with the exclusion of the trait *dumb*. However, since the present values were acceptable, the trait *dumb* was kept in the compound. The mean frequency estimates for the two groups of traits per grade-level are plotted in Figure 12 and some further descriptive statistics are presented in Table 26.

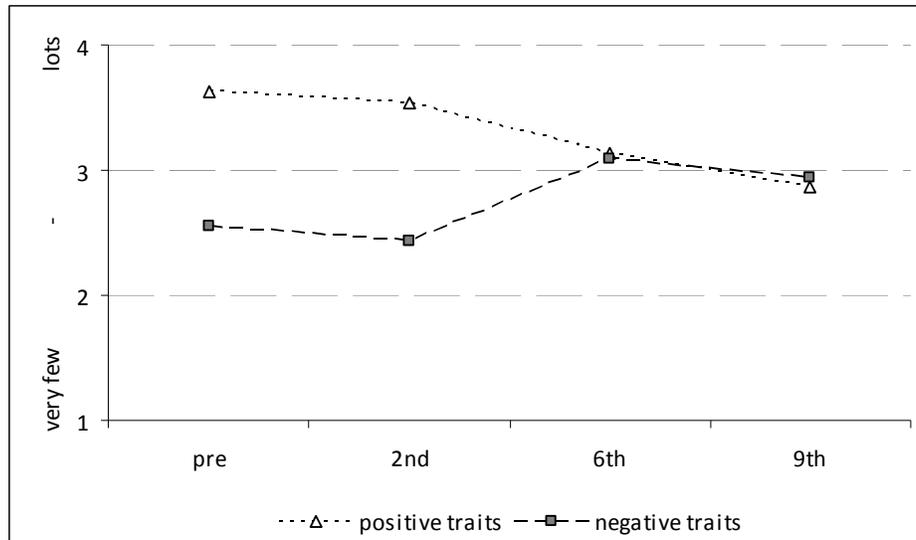


Figure 12: Estimates of the prevalence of people who can be described by the positive and negative traits of Study 6

Although the two younger groups of participants were the ones that rejected more often the existence of someone described simultaneously by a positive and a negative trait, the 95% CI suggest that these two groups consider that there are many to lots of people who can be described by a positive trait and that there are some to many people who can be described by a negative trait. If their rejection of the co-occurrence of traits was based on their doubts that some of the traits were prevalent at all in the population, lower frequency estimates would be expected (i.e., maybe between *very few* and *some*).

As previously, the data were further analysed with a 4 (grade-level) \times 2 (gender) \times 2 (trait valence) repeated measures ANOVA with between-subjects factors. This time raw data were used since the normality and variance homogeneity assumptions were acceptably met.¹²⁷ Again, the different versions of the material did not significantly impact the results and, thus, this factor was excluded from the analyses. Similarly, the gender factor did not produce any significant effect or interactions, but it was kept in the ANOVA model to enhance consistency with the analyses of the previous measure.

¹²⁷ See Appendix U2 for material related with the ANOVA assumptions

Traits	<i>n</i>	<i>M</i>	95% CI	<i>SD</i>	positive vs. negative		
					<i>t</i> (51)	two-tailed <i>p</i>	η_p^2
preschoolers	23						
<i>positive</i>		3.63	[3.46; 3.80]	0.39			
<i>negative</i>		2.55	[2.28; 2.83]	0.63	6.34	< .001	.440
2 nd -graders	16						
<i>positive</i>		3.54	[3.29; 3.78]	0.46			
<i>negative</i>		2.44	[2.24; 2.63]	0.37	5.55	< .001	.377
6 th -graders	10						
<i>positive</i>		3.13	[2.67; 3.59]	0.64			
<i>negative</i>		3.09	[2.77; 3.40]	0.44	< 1		.001
9 th -graders	10						
<i>positive</i>		2.87	[2.65; 3.09]	0.31			
<i>negative</i>		2.94	[2.58; 3.30]	0.50	< 1		.002

Table 26: Descriptive statistics of the frequency estimates for individual traits (means, 95% confidence intervals, and standard deviations) and test statistics with respective p-values and effect sizes for the contrasts between positive and negative traits in Study 6

Overall, participants estimated that there would be more people who could be described by the positive traits than by the negative traits, $F(1, 51) = 24.28$, $p < .001$, $\eta_p^2 = .323$, but this effect was qualified by an interaction with the grade-level, $F(3, 51) = 8.62$, $p < .001$, $\eta_p^2 = .336$. The age-related linear trends for both the positive traits, $t(51) = 4.77$, $p < .001$, $\eta_p^2 = .308$, and for the negative traits, $t(51) = 2.89$, $p = .006$, $\eta_p^2 = .141$, were significant and in opposing directions. An even more detailed contrast analysis (which results are inscribed in Table 26), comparing the estimates regarding the positive and negative traits at each grade-level, revealed that only preschoolers and second-graders, but not sixth- or ninth-graders, estimated that there are more people who could be described by a positive than by a negative trait.

Explanations for co-occurrence

The participants' explanations of how someone could be described by the two traits in a pair were coded in four categories.¹²⁸ The first category was named *literal* and included the explanations that only made reference to specific behaviours that illustrate the given traits (e.g., selfish and rude: "because she doesn't share with anyone and because she swears"). If the mentioned behaviours were more general, encompassing both traits, or not directly

¹²⁸ Due to experimenter mistake some of the explanations referring to the positive congruent pair were lost. The sample sizes for that trait pair were as follows – preschool: $n=11$; 2nd-grade: $n=10$; 6th-grade: $n=9$; 9th-grade: $n=10$. For all other trait pairs, the sample sizes equal the number of participants who accepted the co-occurrence of the traits.

illustrative of the traits (e.g., selfish and rude: “because she misbehaves and has bad grades”), the explanation would be rather coded in the *integrated* category, since it would be assumed that the participant had made a broader inference.

The second category included the explanations that had a rather *segregated* nature and corresponded generically to Asch and Zukier’s (1984) *segregation* mode of resolution. In these explanations each trait was usually assigned to a different moment in time (e.g., good and bad: “because one day she’s bad and another she’s good”) or to a different context (e.g., smart and dumb: “he’s dumb for making the assignments and smart for other things”). Again, if a reason for the apparent segregated behaviour was given (e.g., says truths and is a liar: “she says the truth when that is convenient and lies when that’s convenient”), the explanation would be coded in the *integrated* category, since a common framework for both traits was provided.

The third category contained all the explanations that could be considered, more or less, *integrated*. In Asch and Zukier’s terms it would encompass the *depth dimension*, *cause-effect*, *common source*, *means-end*, and even *interpolation* resolutions. The instances coded in this category explained how someone could be simultaneously described by the two traits (e.g., happy and sad: “she plays happy but she’s always sad”) or contained a reference to other traits inferred from the given ones (e.g., sweet and polite: “he ... is very responsible”).

Finally, a fourth category – *uncategorized* – was created to include the cases that could not satisfactorily be coded under any of the other three categories and the cases when the participant failed to give any response.

In the present study all answers were coded exclusively in one of the categories, and the coders were instructed to assign the more complex category whenever they were in doubt between two categories. The less complex category was theorized to be the *literal* one, since the explanations included in that category could be considered almost as reformulations of the given information. The most complex category would be the *integrated*, as its explanations pointed to a more coherent personality impression (and to more fully resolved incongruencies). The *segregated* category was theorized to reflect an intermediate level of complexity. The Cohen’s kappa index of inter-judges agreement calculated for the two initial coders was $\kappa = .52$ (70% of agreements), indicating an only moderate agreement level.¹²⁹ The disagreements between judges were resolved by the codifications of a third judge.

¹²⁹ One of the initial judges coded much more instances in the literal category than the other judge.

The percentages of the explanations coded as *literal*, *segregated*, *integrated*, or *uncategorized* are presented in Table 27, per type of trait pair (i.e., collapsed across incongruent pairs) and grade-level.¹³⁰ A column with the percentages of participants at each grade-level who rejected the co-occurrence of the traits, and hence did not even try to produce an explanation, was added in order to provide a more complete picture.

Trait pairs	Rejected	Literal	Segregated	Integrated	Uncategorized
congruent positive					
<i>preschoolers</i>	0%	64%	0%	18%	18%
<i>2nd-graders</i>	0%	90%	10%	0%	0%
<i>6th-graders</i>	0%	56%	0%	44%	0%
<i>9th-graders</i>	0%	20%	0%	80%	0%
congruent negative					
<i>preschoolers</i>	48%	30%	9%	13%	0%
<i>2nd-graders</i>	13%	50%	13%	25%	0%
<i>6th-graders</i>	0%	33%	0%	56%	11%
<i>9th-graders</i>	0%	30%	0%	70%	0%
incongruent					
<i>preschoolers</i>	66%	10%	11%	6%	7%
<i>2nd-graders</i>	55%	6%	20%	19%	0%
<i>6th-graders</i>	26%	6%	24%	42%	2%
<i>9th-graders</i>	28%	2%	28%	42%	0%

Table 27: Percentages of participants' explanations coded as literal, segregated, integrated, or uncategorized, along with the percentages of participants who rejected the co-occurrence of traits in Study 6.

In the context of the present study two main results seem noteworthy. First, there was a marked difference between the types of explanations provided for the co-occurrence of congruent traits versus incongruent traits. The co-occurrence of congruent traits was explained by participants of all grade-levels, either by restating the given information (i.e., literal explanations) or by providing a more integrated impression of the target-person, usually through the inference of other evaluatively congruent traits. On the other hand, the co-occurrence of incongruent traits was explained preferentially by *segregated* or *integrated* strategies, except for preschoolers, whose explanations were distributed across all four categories. These results, namely the high percentage of *literal* explanations (i.e., explanations

¹³⁰ See Appendix U3 for a list of the verbatim answers.

that are not resolutions) for the congruent pairs, are consistent with Asch and Zukier's observation (1984) that the resolution of congruent pairs at times seemed to be more difficult than the resolution of incongruent pairs.

The second noteworthy result is that the percentage of explanations coded as *integrated* increased with grade-level, both for congruent and incongruent trait pairs.¹³¹ However, while for the co-occurrence of congruent traits, the majority of the ninth-graders' explanations was coded as integrated, for the co-occurrence of incongruent traits an expressive amount of the explanations were coded as segregated. Again, these results are in consonance with adults' results by Asch and Zukier (1984), who observed high frequencies of the *segregation* resolution mode for some of the incongruent pairs. The age-related increase of integrated explanations is also consistent with the idea that the older participants, in contrast to the younger ones, were better able to integrate incongruent information about someone in a unified personality impression.

Another interesting aspect, although not reflected in the percentages shown in Table 27, was that some of the younger children who rejected the co-occurrence of traits spontaneously provided explanations for their rejection.¹³² Much in line with some of the statements collected by Harter and Buddin (1987) in their study of the understanding of co-occurring emotions (e.g., "You'd have to be two different people to have two feelings at the very same time!", p. 398), some of the children in the present study also referred to this impossibility to unify two different traits in the same person (e.g., smart and dumb: "He had to cut his head in half!"; clean and dirty: "But it could be that the eldest sister is clean and tidy and she's the youngest sister and she's dirty").

Similarly to the previous study, some cautionary remarks should be made about this dependent variable. The first one relates to the nature of the task, namely to its high dependence on verbal language. It may be the case that children produced explanations that were considered less complex (i.e., literal and segregated) only because they do not master verbal language as well as adolescents, for example. The second remark relates to the formulated question. While in Asch and Zukier's study (1984) the participants were explicitly asked to explain how the two traits related to each other, which plausibly promoted integrated solutions, in the present study participants were asked to explain how could someone be described by the two traits simultaneously, which may have encouraged more literal

¹³¹ This finding is still true when the percentages of just the participants who gave an explanation (and not all participants) are considered.

¹³² These statements were also included in Appendix U3.

explanations. Finally, a third remark refers to the applied codification. In spite of the possibility that the instructions did not promote more complex explanations, it may still be the case that the complexity of the provided explanations was overestimated in the present study. For example, the criteria for the codification in the integrated category were rather lenient (e.g., the codification system foresaw some cases in which a seemingly literal or segregated resolution would be coded as integrated; the explanation did not need to be very plausible) and the coders were instructed to opt for the more complex category when in doubt.

3.3.3.C) DISCUSSION

Generally, the results obtained across all measures included in the present study conform to the previously outlined predictions: (1) participants accepted more frequently the possibility that a person could be described by a pair of congruent traits, than by a pair of incongruent traits, especially younger children who also believed congruently described people to be more prevalent in the population than incongruently described people; (2) older participants accepted more frequently than younger participants the existence of people described in incongruent terms and provided more integrated explanations for the occurrence of the incongruencies.

However, there are particularities about each one of these findings. Regarding the first one, while the existence of people described by the positive congruent pair was accepted constantly across grade-levels, the negative congruent pair produced acceptance rates that increased with age (just like the incongruent trait pairs). This result can be interpreted as an instance of younger children's positivity bias in person perception, in the sense that it seemed easier for younger children to conceive the existence of people described in positive, rather than in negative, terms. In fact, other indicators of a positivity bias in younger children's person perception were collected in the current study: (a) higher frequency estimates for people described exclusively in positive terms than for people described solely by negative traits or a combination of positive and negative traits, and (b) higher frequency estimates for people described by a single positive trait in comparison to people described by a single negative trait.

Regarding the second enunciated finding, namely the age-related increase in the acceptance of the co-occurrence of incongruent traits, this pattern was not obtained equally for each incongruent pair of traits. The pairs where the age-related linear changes were clearer

were the ones that, from the outset, seemed to be more difficult to reconcile (i.e., smart-dumb; says truths-is a liar). Some researchers suggest (e.g., Reeder, 1993) that traits that refer to abilities (e.g., *smart* and *dumb*) and to morality (e.g., *says truths* and *liar*) enclose an asymmetry not present in other kinds of traits. For example, a smart person may do dumb things (e.g., under low motivation conditions), but a dumb person should not be able to do smart things. Hence, it should not be difficult to conceive of someone who is smart and does dumb things, but it should be difficult to conceive of someone dumb who is also smart. Asch and Zukier (1984), in a related vein, observed that capacity attributes were “dominant” (p. 1238) and preserved their meaning when combined with other trait terms. A similar reasoning can be applied to the moral sphere, namely while an honest person will not behave dishonestly, a dishonest person may behave dishonestly or honestly, and therefore it should be hard to conceive of someone who is both truthful and a liar. On the other hand, the pairs that contained traits that could be more easily thought of as states (i.e., happy-sad; clean-dirty) did not produce statistically significant age-related linear trends.¹³³ This type of pairs seemed, from the outset, easier to reconcile, for example by referring each trait to different states of the same person. In fact, these two trait pairs obtained the highest acceptance levels from young children of all incongruent pairs. However, this was not true for older participants, which is not consonant with a strict view of resolution easiness.

Similarly to the discussion sections of the two previous studies, the next paragraphs will attempt to profile social perceivers at each grade-level, based on the collected responses. As mentioned earlier, preschoolers in the present study were rather optimistic: half of them believed that a person described by two negative traits did not exist and, in average, they thought that more people with positive traits existed than people with negative traits. This rejection of negativity, however, renders unclear whether preschoolers rejected incongruently described targets on incongruency- or valence-related grounds, since all incongruent trait pairs contained one negative trait. Preschoolers’ explanations of how someone could be described by a pair of traits had generally a low level of integration between the two concepts. The explanations that were considered to be integrated, which occurred mostly with the congruent pairs, did more often refer to a general evaluative aspect that was inferred from the given information than to a well specified personality impression where the two traits were functionally linked.

¹³³ In the *happy* and *sad* pair, however, the trend was marginally significant.

Second-graders' rejection of incongruently described people, on the other hand, seemed to be more clearly related with the incongruency factor. These children already accepted the possibility that someone described by two negative traits may exist, but still tended to reject the existence of people described by two incongruent traits. Moreover, they believed that there are actually more people of the former (i.e., negative) than of the latter (i.e., incongruent) kind. Again, these findings are in consonance with the idea that in middle childhood social perceivers are still unprepared to deal cognitively with incongruent information in impression formation contexts.

Sixth- and ninth-graders had, in the present study, rather similar performances. The higher levels of acceptance that someone can be described in incongruent terms, by these older children and adolescents, does not seem to derive solely from their enhanced ability to conceive possibilities beyond what is observable or real. In fact, these social perceivers seemed to believe that plenty of people could actually be described by incongruent traits and that there are all sorts of people (i.e., with positive traits, negative traits, or a mixture of both). However, there were two instances where sixth- and ninth-graders' responses differed. One of them was the unexpected high degree of acceptance by sixth-graders that people can be *good* and *bad* simultaneously. A speculative interpretation is that this pair, being so saturated in the evaluative dimension, captured more clearly the transition from the dichotic belief that people are either good or bad to the belief that all people are good and bad, which in turn is then made more flexible and nuanced during adolescence. The other difference between sixth- and ninth-graders concerned the production of more integrated explanations for the co-occurrence of congruent traits by the older participants. Since an analogous effect was not observed for the incongruent trait pairs, it seems plausible that this difference is more related to verbal abilities than to substantial differences in the processing of information.

Besides the already mentioned limitations of the present study (e.g., the high dependence of the explanations task on verbal skills), some other shortcomings must be addressed. First, the interpretation of the simultaneity imposition may have differed across grade-levels. In other words, when the experimenter said, for example, that she was thinking of a kid who is smart and dumb *at the same time*, some participants may have assumed that it had to be in the exact same moment, while others may have simply thought that the description had to fit the same person. Eventual differences in criterion, such as these, are difficult to avoid, and they would be problematic if instead of being distributed across grade-levels, one of the interpretations was more frequent in a certain group or groups. However, there are not indicators that younger children made the stricter interpretation, and thus

rejected more often the existence of the incongruently described person. On the contrary, only preschoolers and second-graders, and not older participants, gave segregated explanations (i.e., less strict for simultaneity) for the co-occurrence of congruent traits.

Second, the sample sizes were not constant across grade-levels and were rather low for sixth- and ninth-graders. While this happened due to availability constraints of the participant pool, it may be argued that it was more important to have a larger sample of younger children, with whom it is less certain that the task is being understood as intended, than of older participants, which was the case.

Third, the fact that the trait pairs were a within-subjects variable may introduce the question that the responses given to a certain pair may have been influenced by the responses given to other pairs. Again, the sample sizes were too small to allow for testing order effects. Still, the within-subjects design provides the advantage of knowing that the same participants who accepted the co-occurrence of the congruent traits, rejected sometimes the co-occurrence of incongruent traits.

Finally, the type of incongruency used in the current study, namely co-joint evaluative and descriptive incongruency, was rated by adults in Hampson's study (1998) as the most difficult type of incongruency to reconcile in an impression formation task. Moreover, while Asch and Zukier (1984) studied some trait pairs that were non-fitting but not antagonistic (e.g., *shy* and *courageous*), in the present study the traits in all pairs were opposites. Hence, participants', and particularly young children's, abilities to deal with incongruent traits may be underestimated in the current results. An interesting future research possibility would be to conduct a similar study but with milder forms of incongruency. Due to children's limited trait vocabulary, it seems difficult to unconfound descriptive incongruency (e.g., *generous* and *thrifty*) and evaluative incongruency (e.g., *generous* and *extravagant*) as Peabody suggested (1967). However, it is possible to create pairs that are evaluatively incongruent without being descriptively incongruent (e.g., *smart* and *sad*), more inline with some of Asch and Zukier's pairs (1984).

In spite of the mentioned shortcomings, the present study's results converge with the results of the two previous ones in some important points: (1) younger children's responses seem to have been determined by valence-related aspects to a high extent, rather than solely by the presence of incongruent information; (2) children in middle childhood, on the other hand, seemed to be quite sensitive to incongruency and to generally avoid contemplating incongruent information in impression formation; (3) older children showed signs of increased comfort with the processing of incongruent information; and (4) adolescents

seemed proficient at dealing with incongruent information in impression formation settings. This confluence among studies' results provides even further confidence on the obtained age-related differences when considering that a variety of kinds of incongruency (i.e., evaluative, descriptive, and both), of stimuli (i.e., behavioural descriptions and traits) and of measures were used across these three studies.

The focal measures of these three studies were created anew with the aim of exploring children's and adolescents' responses to incongruent information in impression formation contexts and, as argued above, resulted in promising findings. Still, it was considered desirable to take the exploration one step further using a paradigm that was already vastly used in the social cognitive literature – the *person memory* paradigm –, which was accomplished in the following study.

3.3.4. STUDY 7 – THE NICE KID WHO YELLED AT GRANDMA

As presented in the theoretical framework of this part of the dissertation [SEE SECTION 3.2.2.], the findings obtained with the person memory paradigm allowed identifying (Hastie & Kumar, 1979) and replicating the incongruency effect numerous times (e.g., Costa, 2009; Jerónimo, 2007), and more importantly allowed building, testing, and perfecting sophisticated models of person memory (e.g., Garcia-Marques & Hamilton, 1996; Hastie, 1980; Srull, 1981). Moreover, according to Hamilton and collaborators (1980), in a paper that placed impression formation at the centre of the social cognitive approach, a personality impression can be defined “as the perceiver's *cognitive representation* of another person” (pp. 1050-51), formed by active organisational processes and stored in memory. Therefore, including a person memory study in the exploration of children's and adolescents' responses in impression formation contexts was almost inevitable.

Several person memory studies conducted with children were also briefly reviewed in the framework section of this dissertation chapter [SEE SECTION 3.2.6.] and none of them consisted of a close adaptation of the adult person memory paradigm. Possibly the only exception was the study by McAninch and collaborators (1993), which still had important differences relatively to the adult studies (e.g., the behavioural information was stated by the target-person him/herself in a short video; the participants were asked to produce trait and liking judgements between the expectancy introduction and the behavioural information presentation). Thus, the aim of the present study was to investigate children's performances,

as young as possible, in an adaptation of the person memory paradigm, as close as possible to the versions used with adult participants.

Due to young children's limited trait vocabulary, two broad traits (i.e., *nice* and *mean*) saturated in evaluative meaning were used in this study, in order to assure that even the youngest children (i.e., 4-year-olds) would understand the given expectancy about the target-person and would be able to infer them from the given behavioural descriptions. The rest of the procedure was adapted from the original study by Hastie and Kumar (1979) with two exceptions: (a) two distinct information processing goals were introduced, namely a memorization (M) goal and an impression formation (IF) goal; (b) a second memory measure besides free recall, namely an adaptation of the frequency estimates, and liking judgements were included. The first modification derived from the ample evidence that the participants' performances in recall tests vary a lot according with the processing goal at encoding. Participants under an IF goal have been shown to paradoxically recall more information than participants under a M goal, which has been interpreted as evidence that when social perceivers are forming impressions they impose a more complex organisation on the incoming information than when they are merely trying to memorize the information (e.g., Hamilton et al., 1980). The second modification derived from the TRAP model's empirically validated suggestion that different memory tasks (and other judgements), performed on the same encoded material, rely on different retrieval modes. For example, while free recall depends on an exhaustive search mode and may produce the incongruency effect, frequency estimates and other memory-based judgements depend on a heuristic search mode and usually result in expectancy-congruent biases (e.g., Garcia-Marques & Hamilton, 1996). The inclusion of the two kinds of measures could thus be helpful in the exploration of age-related changes in both types of processes, even if the main interest relied in the free recall task.

OVERVIEW

Participants were instructed either to memorize a set of behaviours or to form an impression of a target-child based on that set of behaviours [*processing goal*], and were told upfront that the target-child was described by other children as being either nice or mean [*prior expectancy*]. Then, participants listened to a set of behavioural descriptions, half of which was congruent with the expectancy and the other half incongruent, and were asked to recall them immediately after presentation. Participants were also asked to estimate whether

expectancy-congruent or incongruent behaviours had been preponderant and to report whether they liked the target. Memory for the prior expectancy was checked.

No differences between the recall of expectancy-congruent and incongruent behaviours were expected for the memorization goal conditions. For the impression formation conditions it was expected that only older participants, and not the younger, would show the incongruency effect, as a result of an increasing tendency to form more integrated impressions. Moreover, it was expected that older children would also recall more information under the impression formation goal than under the memorization goal, as another sign of increasingly organised mental representations of others.

3.3.4.A) METHOD

Participants

Participants in this study were 31 4-year-olds, 31 5-year-olds, 32 7-year-olds, and 31 10-year-olds. Major demographic characteristics (age and gender) of each age-group are summarized in Table 28. Participants lived in the area of New Haven, Connecticut, and the majority was registered in the participants' database of the Social Cognitive Development (SCD) Lab at Yale University. These participants were tested at the SCD lab upon parents' informed consent. A minority of the 4-year-olds was recruited and tested at their preschool upon directors' and parents' informed consent.

Group	Age			Gender	
	<i>M</i>	<i>SD</i>	<i>[min; max]</i>	males	females
4-year-olds	4y 7m	4m	[4y 0m; 4y 11m]	15 (48%)	16 (52%)
5-year-olds	5y 6m	3m	[5y 0m; 5y 10m]	13 (42%)	18 (58%)
7-year-olds	7y 5m	4m	[7y 0m; 7y 11m]	16 (50%)	16 (50%)
10-year-olds	10y 5m	3m	[10y 0m; 10y 11m]	18 (58%)	13 (42%)

Table 28: Descriptive statistics concerning age (mean, standard deviation, minimum and maximum values) and gender (frequencies and percentages) of Study 7 participants

Note. All n=31, except for 7-year-olds (n=32). y = years, m = months.

Material

A list of 98 nice and mean behavioural descriptions, intended to be understandable by young children, was created by 10 young adults. This list of behaviours was then rated by 59 children (3- to 5-years-old) in a 4-point pictorial scale ranging from *really bad* (1) to *really good* (4).¹³⁴ Based on the obtained ratings, a set of 12 nice ($M = 3.84$, $SD = 0.38$) and 12 mean ($M = 1.32$, $SD = 0.60$) behaviours was selected for use in the present study. An example of a nice behaviour is “cleaned up the room” and of a mean behaviour is “bit his brother”.¹³⁵ Four versions of the material (i.e., four lists of 12 behaviours) were created using the pre-selected 24 behavioural descriptions and different orders of presentation. All lists contained 50% of positive behaviours and 50% of negative behaviours.

Another pilot study was conducted in order to explore which amount of behavioural descriptions would be advisable to present to each age-group, so that neither null nor perfect recall would be very probable. Based on the results of this pilot study, it was decided that 4-year-olds would listen to the first four behaviours of the list, 5-year-olds to the first six behaviours, 7-year-olds to the first eight behaviours, and 10-year-olds to all 12 behaviours.

Moreover, a set of ten photos of male and female target-children was created so that the participants, especially the youngest, could have some visual support during the experimental task.¹³⁶ In a similar vein, 12 common names (e.g., John, Mary) were compiled for use as the name of the target-child during the task. Photos and names were randomly assigned to each experimental session.

Procedure

The sessions were run individually by the experimenter, who presented all the materials orally and noted down the answers. Four native English-speaking experimenters collected the data for the present study: almost half of the sessions (46%) were conducted by a female experimenter, and the other half was conducted by one of three male experimenters. The vast majority of the sessions (96%) took place at the SCD lab, and the remaining sessions were conducted in a private preschool.

After asking children’s assent to participate, the experimenter presented the target-child showing the photo and saying his/her name.¹³⁷ Then, participants were informed they were about to listen to some things the target-child had done last week. In the memorization

¹³⁴ The details of this pre-test can be found in Appendix V.

¹³⁵ Appendix V contains a list of all selected behaviours.

¹³⁶ See Appendix W for the photos used in this study.

¹³⁷ The instructions script can be found in Appendix X.

(M) goal conditions, the participants were asked to listen carefully because then they would be asked to repeat those things. In the impression formation (IF) conditions, the participants were asked to try to figure out what kind of child the target was and whether they would like to play with him/her.

Subsequently the experimenter introduced the prior expectancy, informing participants that other children, who knew the target, thought that s/he was either really nice or really mean. Although it is common in adult studies (e.g., Hastie & Kumar, 1979) to induce prior expectancies with multiple and related traits, in the present study a single trait was used due to young children's limited trait vocabulary.

Immediately after the introduction of the prior expectancy, the participants listened to the set of behaviours (4, 6, 8, or 12 according to age-group) read at a rather slow pace ($M = 4.5$ sec, $SD = 0.59$ sec, for a subset of 28 analysed video logs). In all versions and all list sizes, the positive and negative behaviours alternated with sometimes two behaviours, but not more than two, of the same valence occurring in succession. The same behaviours were used in the nice- and in the mean-expectancy conditions, and, as such, the exact same behaviours (e.g., the positive ones) would sometimes be expectancy-congruent (e.g., in the nice-expectancy conditions) and sometimes be incongruent (e.g., in the mean-expectancy conditions).

After the presentation of the behaviours, participants were guided through the dependent measures to be described further down. At the end of the session, participants were thanked and received a little gift at their choice for participating in the study.

Design

Participants within each age-group were distributed randomly by eight experimental groups (three independent variables with two levels each) and were presented with an equal number of congruent and incongruent behaviours. The design can be formalized as: 4 *age-groups* (4 year-olds vs. 5 year-olds vs. 7 year-olds vs. 10 year-olds) \times 2 *processing goals* (memorization vs. impression formation) \times 2 *target-gender* (female vs. male) \times 2 *expectancy* (nice vs. mean) \times 2 *behaviour-type* (congruent vs. incongruent).

Dependent Measures

Free recall. Immediately after the presentation of the behaviours purportedly performed by the target-child, participants were asked to recall them with the experimenter's prompt "What did John [target-child] do last week?". Additional prompts, like "Do you remember anything at all? What did he do?", "Remember what I told you?", "Can you guess?"

What's your best guess?", were used whenever children, usually younger ones, remained silent.¹³⁸

Preponderance estimates. Participants were then asked to estimate whether the target-child had done more positive or more negative behaviours, or about the same amount of positive and negative behaviours. This measure was intended to function as a rough equivalent of the behaviour frequency estimate in adult studies (e.g., Garcia-Marques & Hamilton, 1996), which is a memory measure, like free recall, but supposedly dependent on a very different retrieval process (i.e., heuristic process for estimates and an exhaustive process for free recall). However, the preponderance estimates measure was always collected after free recall (i.e., may be directly affected by the recall results), and does not provide independent estimates for congruent and incongruent behaviours, contrary to frequency estimates.

Liking ratings. Participants provided liking ratings of the target-child on a 4-point rating scale, conveyed orally by the experimenter in two steps. In the first step the experimenter asked whether the participant liked the target-child or not. In the second step the experimenter offered two more alternatives depending on the participant's response to the first step. If the response had been positive, the options were *really like him/her* and *like him/her a little*, while if the response had been negative, the options were *really don't like him/her* and *don't like him/her a little*. The values 1 to 4 were assigned to the responses in increasing order of liking. This measure was included in order to study the eventual impact of the prior expectancy in the final impression participants formed of the target-child.

Memory for expectancy. The final dependent measure was a control question for the memory of the prior expectancy. Participants were asked whether the experimenter, at the beginning, had said that other children thought the target-child was nice or mean.

3.3.4.B) RESULTS

Memory for expectancy

A surprisingly high number of children (i.e., 18%) did not remember correctly the prior expectancy given by the experimenter before reciting the behaviours. Moreover, these children were not condensed in certain groups, but present in all age-groups (4yr-olds: 23%;

¹³⁸ See Appendix X for an exemplar of the coding sheet

5yr-olds: 23%; 7yr-olds: 16%; 10yr-olds: 13%), in the two processing goals (M: 16%; IF: 21%), and for both types of expectancy (nice: 21%; mean: 16%).

These results may indicate that giving a single trait is insufficient for children to form a solid prior expectancy. Another possibility would be that children had *forgotten* about the initial expectancy in face of the incongruent behaviours. If this was the case, then it would be expectable to find a positive relation between preferential recall of expectancy-incongruent behaviours and incorrect answers in this control measure. In order to investigate this eventual relation, a recall-difference index¹³⁹ was calculated for each participant and correlated with his/her accuracy in the present task. However, this relation was not statistically significant for any one of the age-groups.

All forthcoming analyses were repeated excluding the participants who failed this control question. Because the obtained results were very similar (with and without these participants) and did not alter any of the drawn conclusions, the reported analyses include the data from all participants.

Free recall

As mentioned earlier, each age-group was given a different amount of behavioural descriptions as stimuli for memorization or impression formation. Although the decision about the suitable amounts was not made arbitrarily, but based on the results of a pilot study, it is impossible to ascertain that the amount of behaviours selected for one of the groups was equivalent, in terms of cognitive demands and otherwise, to the amount selected for any of the other groups. For example, null recall among 4-year-olds happened in 35% of the cases (the majority of them in IF conditions), in 13% of the cases for 5-year-olds, 3% for 7-year-olds, and in none of the 10-year-olds' group. As such, direct comparisons of the recall between age-groups are unsubstantiated and were not statistically analysed. For illustrative purposes, recall proportions were calculated (Figures 13 and 14), but the analyses were conducted with the number of recalled behaviours as dependent variable, separately for each age-group.

In the 4- and 5-year-olds' groups 10% of the participants produced statements that were coded as intrusions. Seemingly all the intrusions referred to activities that the participants themselves had done in the past and the majority of them was not clearly valenced (e.g., "went to the dino museum"). Intrusions seemed to be more frequent in the

¹³⁹ The recall-difference index equals the number of recalled congruent items minus the number of recalled incongruent items, divided by the number of all recalled items. Participants with null recall had to be dropped from the analysis, since the index could not be calculated in those cases.

mean-expectancy conditions, but due to their small amount these occurrences were not further analysed.¹⁴⁰ In the older age-groups (i.e., 7- and 10-year-olds) intrusions did not occur.

The focal analysis of the free recall data concerned the comparisons between recall for congruent and incongruent items in each one of the processing goals (see Figure 13).

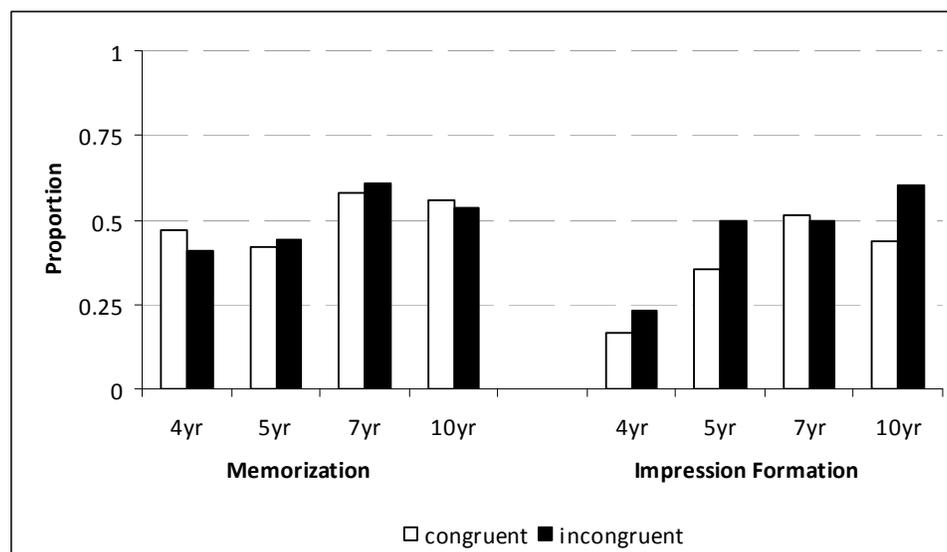


Figure 13: Proportion of congruent and incongruent recalled items per age-group and processing goal in Study 7

Preliminary analyses showed that neither the different versions of the material, nor the gender of the participant, or the gender of the target produced significant effects or interactions. The only exception was found in the 4-year-olds' group, where the target-gender interacted significantly with the processing goal and the type of item, $F(1, 23) = 6.30$, $p = .020$, $\eta_p^2 = .215$. This third-order interaction originated from the fact that participants in the M conditions recalled more congruent behaviours when the target was a girl and more incongruent behaviours when the target was a boy. However, this statistical result does not seem to have a substantial interpretation and the target-gender factor did not impact any other result. Therefore, and in order to optimize the consistency with the analyses performed for the other age-groups, these three factors (i.e., version, participant-gender, and target-gender) were excluded from the reported analysis.

A 2 (processing goal) \times 2 (expectancy) \times 2 (item-type) repeated measures ANOVA with between-subjects factors was calculated for each age-group. In all cases the assumptions of normality and variance homogeneity seemed to be well enough satisfied and, thus, the

¹⁴⁰ A list of all intrusions can be found in Appendix Y1.

ANOVAs were conducted on the raw data.¹⁴¹ Some descriptive statistics and contrast test statistics by age-group can be found in Table 29.

	<i>n</i>	<i>M</i>	95% CI	<i>SD</i>	cong vs. incong		
					<i>t</i> (df)	two-tailed <i>p</i>	η_p^2
Memorization							
4-year-olds	16						
<i>congruent</i> (<i>n</i> =2)		0.94	[0.58; 1.30]	0.68	<i>t</i> (27) < 1		.018
<i>incongruent</i> (<i>n</i> =2)		0.81	[0.37; 1.26]	0.83			
5-year-olds	15						
<i>congruent</i> (<i>n</i> =3)		1.27	[0.78; 1.76]	0.88	<i>t</i> (27) < 1		.003
<i>incongruent</i> (<i>n</i> =3)		1.33	[0.79; 1.87]	0.98			
7-year-olds	16						
<i>congruent</i> (<i>n</i> =4)		2.31	[1.89; 2.74]	0.79	<i>t</i> (28) < 1		.005
<i>incongruent</i> (<i>n</i> =4)		2.44	[1.96; 2.91]	0.89			
10-year-olds	15						
<i>congruent</i> (<i>n</i> =6)		3.33	[2.72; 3.95]	1.11	<i>t</i> (27) < 1		.014
<i>incongruent</i> (<i>n</i> =6)		3.20	[2.33; 4.07]	1.57			
Impression Formation							
4-year-olds	15						
<i>congruent</i> (<i>n</i> =2)		0.33	[-0.01; 0.68]	0.62	<i>t</i> (27) < 1		.019
<i>incongruent</i> (<i>n</i> =2)		0.47	[0.11; 0.82]	0.64			
5-year-olds	16						
<i>congruent</i> (<i>n</i> =3)		1.06	[0.53; 1.59]	1.00	<i>t</i> (27) = 1.68	.104	.095
<i>incongruent</i> (<i>n</i> =3)		1.50	[0.99; 2.01]	0.97			
7-year-olds	16						
<i>congruent</i> (<i>n</i> =4)		2.06	[1.50; 2.63]	1.06	<i>t</i> (28) < 1		.001
<i>incongruent</i> (<i>n</i> =4)		2.00	[1.42; 2.58]	1.10			
10-year-olds	16						
<i>congruent</i> (<i>n</i> =6)		2.63	[2.01; 3.24]	1.15	<i>t</i> (27) = 2.35	.026	.170
<i>incongruent</i> (<i>n</i> =6)		3.63	[2.95; 4.30]	1.26			

Table 29: Descriptive statistics of the number of recalled behaviours (means, 95% confidence intervals, and standard deviations) and test statistics with respective p-values and effect sizes for the contrasts between the recall of congruent and incongruent items in Study 7

In the 4-year-olds' group the only factor that produced an effect that approached statistical significance was the processing goal, $F(1, 27) = 4.10$, $p = .053$, $\eta_p^2 = .132$, denoting that participants in the M conditions tended to recall in average more items than participants in the IF conditions. For the 5-year-olds' group none of the factors produced effects or interactions. In the group of the 7-year-olds, the processing goal produced once again a

¹⁴¹ See Appendix Y2 for the Levene's tests and full ANOVA tables by age-group.

marginal main effect, $F(1, 28) = 2.93, p = .098, \eta_p^2 = .095$, with participants in the M conditions tending to recall more items than participants in the IF conditions. Moreover, there was a significant main effect for the prior expectancy, $F(1, 28) = 10.50, p = .003, \eta_p^2 = .273$, indicating that participants in the mean-expectancy conditions recalled reliably more behaviours than participants in the nice-expectancy conditions. While this main effect was not significantly qualified by an interaction with the processing goal factor, the IF goal contributed more visibly to the main effect of the prior expectancy than the M goal, as evidenced by the contrasts (IF: $t(28) = 3.05, p = .005, \eta_p^2 = .249$; M: $t(28) = 1.54, p = .135, \eta_p^2 = .078$). With the 10-year-olds, the interaction between processing goal and type of item reached statistical significance, $F(1, 27) = 4.36, p = .046, \eta_p^2 = .139$, in the expected direction, namely only IF participants, but not M participants, recalled more expectancy-incongruent than congruent behaviours, $t(27) = 2.35, p = .026, \eta_p^2 = .170$. However, the prior expectancy also interacted significantly with the item-type factor, $F(1, 27) = 25.31, p < .001, \eta_p^2 = .484$, attesting that participants in the nice-expectancy conditions recalled more incongruent items, $t(27) = 4.63, p < .001, \eta_p^2 = .443$, while participants in the mean-expectancy conditions recalled more congruent items, $t(27) = 2.59, p = .015, \eta_p^2 = .199$.

Another set of analyses was conducted in order to verify eventual effects of the valence of the behavioural descriptions on the participants' recall (see Figure 14). In principle if there was a tendency to recall better either the positive or the negative items, the interaction between prior expectancy and type of item in the previous set of analyses should have been significant (as it was the case for the 10-year-olds' group). However, recoding the behaviours as positive or negative and entering this factor directly in the analyses would allow confirming the previous results and exploring other eventual interactions. Four 2 (processing goal) $\times 2$ (expectancy) $\times 2$ (item-valence) repeated measures ANOVAs with between-subjects factors were calculated, one for each age-group.¹⁴² As expected the only significant effects for valence were obtained in the group of the 10-year-olds, with negative behaviours being recalled significantly better than positive behaviours, $F(1, 27) = 32.34, p < .001, \eta_p^2 = .545$. Moreover, there was a significant third-order interaction between processing goal, prior expectancy, and valence of the item, $F(1, 27) = 6.22, p = .019, \eta_p^2 = .187$. The contrast analysis revealed that, while in the M conditions negative items were better recalled independently of the prior expectancy (nice-expectancy: $t(27) = 2.65, p = .013, \eta_p^2 = .207$; mean-expectancy: $t(27) = 3.40, p = .002, \eta_p^2 = .300$), in the IF conditions the negative items

¹⁴² See Appendix Y2 for material related with the ANOVA assumptions and for the full ANOVA table.

were better recalled only when they were incongruent with the prior expectancy (nice-expectancy: $t(27) = 5.00, p < .001, \eta_p^2 = .481$; mean-expectancy: $t(27) < 1$).

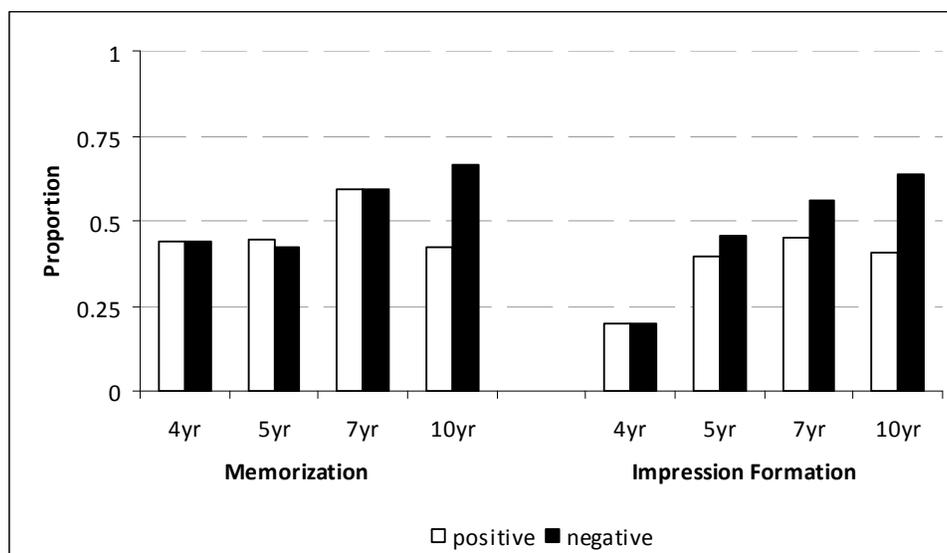


Figure 14: Proportion of positive and negative recalled items per age-group and processing goal in Study 7

Summing up the main results so far, the incongruity effect was found only in the 10-year-old age-group. Not only did these children recall more expectancy-incongruent than congruent items, but they only did so in the IF, and not in the M, conditions. However, this effect was not accompanied by a better total recall on IF conditions when compared to M conditions, which would corroborate the idea that 10-year-olds are already forming organised and integrated personality impressions. On the contrary, there was a tendency for better recall in M than in IF both for 4- and 7-year-olds. The first robust sign of the impact of valence on information processing, in the present study, emerged in the 7-year-olds' group, with their better recall of the behaviours that were supposedly performed by a mean target child. In the 10-year-olds' group, the sensitivity to the valenced material was observed in the better recall of negative items, when compared to the positive ones, in the M conditions. In the IF conditions, this negativity effect seemed to co-exist with the incongruity effect (i.e., there was a better recall for negative items, but only when they were expectancy-incongruent).

Preponderance estimates

The estimates provided by the participants were coded with the value -1 if they said the target-child had done *more bad things*, with the value +1 if they opted for *more good*

things, and with the value 0 if the participants believed that the target child had done about the same amount of good and bad things (i.e., the correct answer). If children formed a first impression based on the given expectancy and if they developed expectancy-based illusory correlations, as it is usually the case with adults (Garcia-Marques & Hamilton, 1996), then one would expect to find lower estimate values in the mean-expectancy conditions than in the nice-expectancy conditions. The obtained average values are depicted in Figure 15 and some more descriptive statistics are presented in Table 30.

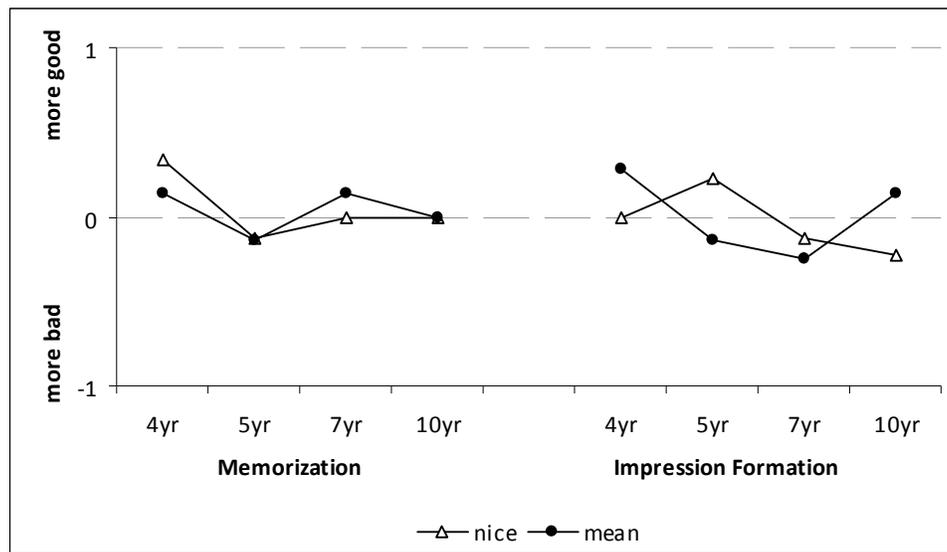


Figure 15: Preponderance estimates per age-group and processing goal in Study 7

Again, preliminary analyses showed no evidence of impact of the participant-gender, target-gender, and version variables. A 4 (age-group) \times 2 (processing goal) \times 2 (expectancy) ANOVA conducted on the preponderance estimates attested that there were no reliable differences in any of the age-groups, processing goals or prior expectancy conditions.¹⁴³

¹⁴³ See Appendix Y3 for the ANOVA assumptions related material and the full ANOVA table.

	Mean-expectancy			Nice-expectancy		
	<i>M</i>	95% CI	<i>SD</i>	<i>M</i>	95% CI	<i>SD</i>
<i>Memorization</i>						
4-year-olds	0.14	[-0.50; 0.78]	0.69	0.33	[-0.21; 0.88]	0.71
5-year-olds	-0.14	[-0.78; 0.50]	0.69	-0.13	[-0.82; 0.57]	0.83
7-year-olds	0.14	[-0.50; 0.78]	0.69	0.00	[-0.38; 0.38]	0.50
10-year-olds	0.00	[-0.76; 0.76]	0.82	0.00	[-0.45; 0.45]	0.53
<i>Impression Formation</i>						
4-year-olds	0.29	[-0.41; 0.98]	0.76	0.00	[-0.92; 0.92]	1.00
5-year-olds	-0.14	[-0.97; 0.69]	0.90	0.22	[-0.12; 0.56]	0.44
7-year-olds	-0.25	[-0.64; 0.14]	0.46	-0.13	[-0.67; 0.41]	0.64
10-year-olds	0.14	[-0.21; 0.49]	0.38	-0.22	[-0.73; 0.29]	0.67

Table 30: Descriptive statistics of the preponderance estimates (means, 95% confidence intervals, and standard deviations) in Study 7

Note. There was one missing response in the 4-year-olds' group, IF, nice-expectancy condition.

Liking ratings

As with the previous measure, it was expected that if participants formed a first impression based on the prior expectancy, their evaluative judgements of the target-child might be more favourable in the nice-expectancy conditions than in the mean-expectancy conditions. Figure 16 presents the average liking ratings for each age-group and processing goal, and Table 31 presents further descriptive statistics.

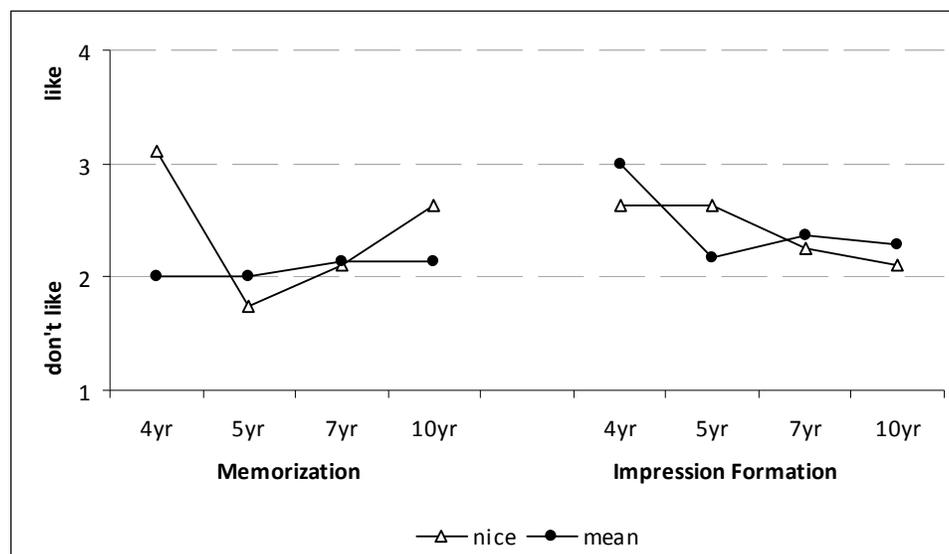


Figure 16: Liking ratings per age-group and processing goal in Study 7

A 4 (age-group) \times 2 (processing goal) \times 2 (expectancy) ANOVA on the liking ratings revealed no significant effects or interactions.¹⁴⁴ The only expectancy-based difference in the liking ratings was found in the 4-year-olds group in the M condition, $t(107) = 2.34$, $p = .021$, $\eta_p^2 = .049$.

	Mean-expectancy			Nice-expectancy		
	<i>M</i>	95% CI	<i>SD</i>	<i>M</i>	95% CI	<i>SD</i>
<i>Memorization</i>						
4-year-olds	2.00	[0.93; 3.07]	1.15	3.11	[2.30; 3.92]	1.05
5-year-olds	2.00	[1.08; 2.92]	1.00	1.75	[0.88; 2.62]	1.04
7-year-olds	2.14	[1.31; 2.97]	0.90	2.11	[1.51; 2.71]	0.78
10-year-olds	2.14	[1.50; 2.78]	0.69	2.63	[2.19; 3.06]	0.52
<i>Impression Formation</i>						
4-year-olds	3.00	[1.93; 4.07]	1.15	2.63	[1.74; 3.51]	1.06
5-year-olds	2.17	[0.62; 3.71]	1.47	2.63	[1.74; 3.51]	1.06
7-year-olds	2.38	[1.94; 2.81]	0.52	2.25	[1.51; 2.99]	0.89
10-year-olds	2.29	[1.59; 2.98]	0.76	2.11	[1.51; 2.71]	0.78

Table 31: Descriptive statistics of the liking ratings (means, 95% confidence intervals, and standard deviations) in Study 7

Note. There were two missing responses in the 5-year-olds' group, IF condition: one in the nice- and the other in the mean-expectancy condition.

The gender of the participant and the gender of the target did not produce significant effects or interactions when added individually to the above described analysis. However, when entered together in a 4 (age-group) \times 2 (participant-gender) \times 2 (target-gender) ANOVA the interaction between both factors was highly significant, $F(1, 107) = 19.42$, $p < .001$, $\eta_p^2 = .154$.¹⁴⁵ This interaction originated from the fact that female participants liked female targets more ($M = 2.86$) than male targets ($M = 1.97$), while the reverse was true for male participants (male targets: $M = 2.59$; female targets: $M = 2.06$). Hence, although there was no evidence of a consistent expectancy bias in the liking ratings of the present study, the

¹⁴⁴ See Appendix Y4 for the ANOVA assumptions related material and the full ANOVA table.

¹⁴⁵ In this ANOVA model the age-group main effect was statistically significant, $F(3, 107) = 2.76$, $p = .046$, $\eta_p^2 = .072$. This main effect seemed to be due to the higher liking ratings produced by 4-year-olds in comparison to the other three age-groups, $t(107) = 2.71$, $p = .008$, $\eta_p^2 = .064$. The full ANOVA table can be found in Appendix Y4.

results replicated a robust finding in the developmental literature, namely children's gender-based in-group favouritism (e.g., Maccoby, 1988; McAninch et al., 1993; Powlishta, 1995).

Correlations among recall, estimates, and liking

Eventual associations between the dependent measures were explored with the aim of detailing the analyses of the data obtained with the present study. For calculating the correlations the recall-difference index¹⁴⁶ was used and the two other measures (i.e., preponderance estimates and liking ratings) were recoded, as follows: (a) the estimates were recoded so that higher values reflected an estimate that is expectancy-congruent (i.e., when a preponderance of nice behaviours was estimated for a nice target, or a preponderance of mean behaviours was estimated for a mean target); (b) similarly, the liking ratings were recoded so that higher values reflected expectancy-congruent liking (i.e., more liking of a nice target and less liking of a mean target).

Possibly due to the small sample sizes, only one out of 24 correlation coefficients attained statistical significance.¹⁴⁷ However, some of the results seem noteworthy. First, when collapsed across age-groups, the overall correlation between preponderance estimates and liking ratings was significant both in the M conditions, $r(57) = .32, p = .016$, and in the IF conditions, $r(50) = .33, p = .018$. These correlations suggest that estimates and liking judgements rely on similar processes or are affected by similar factors. Second, in neither one of the processing goal conditions were the liking ratings correlated with the recall-difference index (M: $r(57) = .13, p = .341$; IF: $r(50) = -.03, p = .858$), suggesting that the liking judgements were not dependent on the type of information that the participant explicitly recalled. Third, the participants' estimates correlated with their recall-difference index only in the M conditions, $r(57) = .39, p = .002$, but not in the IF conditions, $r(50) = -.06, p = .656$, which is an interesting result considering that both free recall and estimates are memory measures.

This pattern of correlations replicates the results obtained, with fairly similar measures, in the study accompanying the proposal of the TRAP model (i.e., Garcia-Marques & Hamilton, 1996 – Study 1). In the present study, the assumptions of this model, namely that while free recall depends on an exhaustive retrieval process, the estimates and other memory-based judgements depend on a more heuristic retrieval process, would also help

¹⁴⁶ This index was presented in the *memory for expectancy* section and basically reflects the tendency of each participant to recall more congruent or incongruent behaviours.

¹⁴⁷ See Appendix Y5 for the table containing all correlations coefficients.

understanding the obtained pattern of correlations. However, two aspects must be noted. (1) According to the TRAP model, the outcomes of the exhaustive and heuristic retrieval processes will differ only when the behaviours are associated with each other in memory (as it is usually the case with adults under an IF goal), and thus the absence of a significant correlation between estimates and recall in IF conditions, but the presence of such a correlation in M conditions. This dissociation between processing goals was, as mentioned, obtained in the present study, however other signs of a more interrelated memory representation under an IF, rather than a M, goal were not found (e.g., a better total recall in IF conditions compared to M conditions). (2) The correlations per age-group were not statistically significant, which may be due mainly to the fact that the sample sizes were small. However, one could expect that in most of the cases, the pattern would be similar. While in the M conditions this is true for all age-groups except for the 7-year-olds, in the IF conditions the only age-group that resembles the overall pattern is the 5-year-olds. This finding may be interesting by itself, and would need further exploration, but seriously questions any interpretation of the overall correlations for the IF conditions.

3.3.4.c) DISCUSSION

The results obtained with the focal measure of this study, namely the free recall task, were consistent with the predicted ontogenetically late emergence of the incongruity effect. While 10-year-old participants with a memorization processing goal recalled equally well expectancy-congruent and incongruent behaviours supposedly performed by a target-child, their counterparts with an impression formation goal recalled better the expectancy-incongruent items (i.e., they exhibited the incongruity effect). All other age-groups, independently of the processing goal, did not show any tendency to recall better one type of behaviours over the other. These findings suggest that only 10-year-olds, and not younger groups, were interconnecting the different bits of information in a unified mental representation (i.e., were forming an integrated impression) when asked to form an impression of the target.

However, the expected better recall for participants who were trying to form an impression, compared to participants who were merely memorizing the material, did not occur in any age-group. In fact, the reverse tendency was found for 4- and 7-year-olds. With adults the usual higher recall in IF conditions (e.g., Garcia-Marques & Hamilton, 1996;

Hamilton et al., 1980) is interpreted as evidence that the mental representation of the target formed under an IF goal is more organised, containing more interbehavioural associations, than the representation formed under a M goal. Therefore, in order to be able to fully attribute these characteristics to the 10-year-olds' mental representations formed under IF conditions, the total amount of recall should have been higher than in M conditions, which was not the case.

Based on the previous studies of the current research project, and also in the literature (e.g., Kinzler & Shutts, 2008), valence-related effects in recall were expected, namely among younger children. Nonetheless, the analyses of the present recall data did not identify valence-related effects in the groups younger than 7 years of age. For this group there was a negativity effect so that the behavioural information regarding the target initially described as *mean*, independently of its valence or level of congruency with the expectancy, was better recalled than information regarding the *nice* target, particularly in IF conditions. For the 10-year-olds another negativity effect arose, but this time it was the negative behavioural information per se that was better recalled under the M goal. Under an IF goal, both the negativity and the incongruency of the information impacted the recall levels, so that the negative behaviours were better recalled when they referred to a positive target, but were not better recalled than the positive behaviours when they referred to a negative target.

The predicted expectancy-based effects on the two other measures, namely the preponderance estimates and the liking judgements, were not obtained. Although there were some signs that these measures may have been functioning properly, like the gender-based in-group favouritism obtained with the linking ratings and the pattern of correlations among measures, there are some methodological aspects, to be detailed further down, that must be addressed before more substantial conclusions can be drawn.

From the results section and from the preceding paragraphs it should be clear that the current results contain a high number of null effects. Some of these effects were predicted based on the adult person memory literature, like the null recall difference between expectancy-congruent and incongruent behaviours in the M conditions (e.g., Garcia-Marques & Hamilton, 1996), and others, like the analogous null difference in the IF conditions for the younger participants, were predicted based on the studies that suggest that younger children have difficulties in forming integrated personality impressions (e.g., Studies 4, 5, and 6). Some other null effects, however, were not expected, like the absence of valence effects in younger ages and the null recall differences between M and IF conditions. To this latter kind of unpredicted null effects, belong the results obtained with the two other measures (i.e.,

preponderance estimates and liking ratings), as well. However, independently of having been predicted or not, null effects should not be over-interpreted. In the present case, there are a lot of methodological aspects that may have influenced the results and be at the origin of these null effects. These methodological features will be reviewed in the next paragraphs.

The impression formation goal. In the adults person memory literature, a good indicator that the participants were successfully induced into an impression formation processing goal is a better total recall on IF conditions than on M conditions. As noted before, this indicator was not obtained in the present study. While the reason for this absence may be theoretically interesting, indicating for example that children are not yet capable of producing highly interconnected mental representations of others, the absence of better recall in IF conditions may also have originated in methodological problems. It can be argued that the instructions were not understood, or were not enough to induce an IF goal in the children participants. A promising way to overcome this problem in the future would be to give participants *anticipated interaction* instructions, namely to tell them that after listening to some information about the target, they would actually meet and interact with the target. In adult person memory literature, this type of instructions (i.e., anticipated interaction) heighten participants' attention to the target-person, their levels of recall for target-related information, and their confidence in trait ratings of the target, for example (Berscheid, Graziano, Monson, & Dermer, 1976), suggesting that it fosters a more thorough impression formation. Moreover, Devine, Sedikides, & Fuhrman (1989) compared a set of different processing goals and concluded that anticipated interaction resulted in the highest levels of organisation in the mental representation of others, even higher than the impression formation goal.

Another possibility is that children may be less flexible than adults in using information that was encoded with a specific goal, in a way that is not consistent with that goal. In other words, it is possible that children do not have great difficulties at recalling information that was encoded under a M goal (i.e., the free recall task was expected), but have a hard time recalling information that was encoded under an IF processing goal (i.e., where the free recall task comes as a surprise). This possibility could explain why there was a tendency for better recall in the M, rather than the IF, condition in the 4- and 7-year-olds' groups. Yet, the absence of this tendency in the 5-year-olds' group would remain difficult to understand.

The absence of a filler task. In some of the person memory studies with adults and children (see e.g., Stangor & McMillan, 1992), a filler task is included between the stimuli presentation (i.e., encoding) phase and the memory test (i.e., retrieval). The filler task ensures

that the working memory was free of the previously learned material when participants are performing the retrieval task. However, with young children the risk that the memory test becomes too difficult with an intercalated filler task is high, and in the present case it was opted for an immediate recall test. Nevertheless, the absence of a filler task may have selectively facilitated higher levels of recall in the M conditions, where children were already expecting a memory test. This possibility would then help understanding why recall in the M condition tended to be higher than in the IF condition in younger age-groups and why 10-year-olds did not recall more items under the IF condition, as expected. In future studies the inclusion of a small delay between phases (e.g., 2 min) may be advisable to rule out this explanation.

The prior expectancy. The paradigm used in the present study depends crucially on a successfully induced prior expectancy. The behavioural stimuli will be defined as congruent or incongruent solely in respect to this prior expectancy (particularly since there were as many congruent as incongruent behaviours). It was decided to give a single strong evaluative trait label (i.e., *nice* and *mean*) as the prior expectancy because young children have a limited trait vocabulary, and particularly in the case of *mean*, easy synonyms were hard to find. Unfortunately, with the present data, one cannot fully guaranty that this prior expectancy was effectively induced: (a) there was a surprisingly high number of participants who, at the end of the procedure, did not recognize accurately the previously given expectancy;¹⁴⁸ (b) no expectancy-based effects were found in the preponderance estimates or in the liking ratings measures. A special care in future studies should be taken to make the prior expectancy more salient, may it be by providing more related trait labels, more expectancy-congruent behaviours, or eventually by prompting participants to repeat the given expectancy before the presentation of the stimuli list.

The difficulty of the task. Some of the characteristics of the experimental tasks created for the current study may have reduced the probabilities of finding the incongruency effect. One of these features was the inclusion of an equal number of expectancy-congruent and incongruent items, which would allow attest that an eventually obtained incongruency effect (as in the case of the 10-year-olds) was not merely a Von Restorff effect. However, although in the adult person memory literature the incongruency effect has been found with this kind of lists (e.g., Garcia-Marques & Hamilton, 1996; Hastie & Kumar, 1979) and even with lists where the expectancy-incongruent items are in majority (Srull, 1981), the dimension of the

¹⁴⁸ But please recall that analyses conducted excluding these participants' data lead to the same results as the reported analyses.

effect is typically smaller than when expectancy-congruent items outnumber the incongruent items.

Another feature of this paradigm is that the focal measure must be free recall, which usually relies heavily on verbal reports. Hence, this task may be disproportionately more demanding for younger children in comparison to older children, and even for these latter in comparison to adults.

Moreover, the size of the list with the behavioural descriptions was adjusted by age-group so that the task for any of the groups would not be much more difficult than for the other groups. However, this adjustment implied that relatively few items would be given to the younger children (e.g., two expectancy-congruent and two incongruent items for 4-year-olds), thus reducing the sensitivity of the measure when compared to the oldest group, for example.

At this point, it should be noted that all of the above described methodological aspects may have led to an underestimation of children's ability to form integrated impressions in the present study. Maybe with different IF instructions, the addition of a filler task, a stronger prior expectancy, the inclusion of more expectancy-congruent than incongruent behaviours, and a more sensitive measure, even young children (e.g., 4- and 5-year-olds) would exhibit signs of having created a more interconnected mental representation under an IF goal than under a M goal and/or signs of sensitivity to the valence or level of congruency of the material. The question whether with some or all of these modifications, different results would be obtained with young children is an empirical, and worthwhile, question.

The preponderance estimates. This task was always completed after the free recall task because the main focus of the present study was on the recall measure, and adding the counterbalancing of the task order would make the design even more complex. Hence, the preponderance estimates might have been influenced by the previous explicit retrieval of memorized items. In fact, in the M conditions the correlations between the preponderance estimates and the recall-difference index were stable and positive across age-groups. These correlations, which replicate the findings obtained by Garcia-Marques and Hamilton (1996) who counterbalanced the order of the estimates and recall tasks, can be interpreted according to the TRAP model. The reasoning is that under a M goal the created mental representation of the target does not contain interbehavioural associations, and thus the heuristic (i.e., for the estimates) and the exhaustive (i.e., for recall) retrieval processes will operate similarly. However, in the current study it cannot be assured that the correlations were not a by-product of the sequencing of the tasks. In the IF conditions, the eventual influence of recall on the

estimates had to be non-linear, since no stable correlations across age-groups were found, but this alternative explanation cannot be entirely dismissed.

Another problem with the preponderance estimates was that they did not allow independent assessments of the estimates for expectancy-congruent and incongruent items. The task was built in terms of preponderance, and not of raw frequencies, due to young children's still limited understanding of numerical concepts. However, independent estimates for the occurrence of expectancy-congruent and incongruent behaviours would increase the sensitivity of the measure and allow conducting other type of analyses. A possibility for future studies may be an intermediate solution, where children participants are asked not for raw frequency estimates, but to judge the amount of presented congruent and incongruent items in two separate rating scales (e.g., ranging from *very few* to *a lot*).

A further aspect related to the preponderance estimates is that the lists were organised so that no more than two behaviours of the same valence would succeed each other. This alternation between types of behaviour may have made it fairly obvious to the participants that they were represented in equal, or very similar, amounts in the lists. This potential problem may be circumvented in future studies by including also neutral behavioural descriptions in the composition of the lists.

The liking judgements. Similarly to the estimates case, the liking ratings were produced immediately after the participants had thought about the preponderance of positive and negative (or expectancy-congruent and incongruent) behaviours and after they had tried to explicitly recall all presented information. The obtained positive correlations between estimates and liking judgements, which were the most stable across age-groups and conditions, may thus derive simply from the fact that the two tasks were completed in succession, and not from relying on similar memory-based processes.

Moreover, liking ratings are not identical to trait ratings (e.g., Srull & Wyer, 1989) and represent a more indirect measure of the contents of the formed impression. In the present study the liking ratings were preferred over the trait ratings again due to young children's limited trait vocabulary. However, it is possible that liking ratings are more sensitive of children's dislike for incongruency than trait ratings would be. In other words, both targets (i.e., the one presented as mean and the one presented as nice) were equally incongruent, in the sense that both of them had the same amount of expectancy-disconfirming material in their descriptions. It could be the case that the trait ratings would have reflected expectancy-based effects, which were overridden in the liking ratings by children's dislike of incongruent material.

Amidst all of the above listed methodological aspects that may have influenced the results, the merits of the present study should not be elapsd. This study represents the closer adaptation of the *person memory* paradigm in the developmental literature. As discussed earlier [SEE SECTION 3.2.6.B], the person memory studies conducted with children shared rather few characteristics with the studies that led to the identification of, and replicated, the incongruency effect with adults, which made the interpretation of the results in a common framework very difficult. For example, in none of the child studies included in Stangor and McMillan's meta-analysis (1992), or other person memory child studies that were to be found, were the instructions given to the participants clearly impression formation instructions. This fact alone makes it quite difficult to draw any solid conclusions about the way children form mental representations about others under an impression formation goal. Conversely, the present study not only included specific impression formation instructions, but it also contrasted two different processing goals. Many steps towards the validation of such instructions must be given before it can be assured that the lack of interconnectedness (if any) in children's mental representations derive from their cognitive processes rather than from a misunderstanding of the instructions, but the first step can be found in the present person memory study and in the other impression formation studies of this part of the dissertation.

Moreover, by studying at each age-group the effects of opposing expectancies on the memory for the same behavioural descriptions, which were thus expectancy-congruent in some conditions and expectancy-incongruent in others, the present study could assess the differential impact of valence and congruency in children's responses. The expectancies were trait-based (rather than gender-based), and the stimuli were multiple behavioural descriptions that could be integrated into a unified personality impression. All these features represent innovations regarding the person memory child studies included in the Stangor and McMillan's meta-analysis (1992). Considering McAninch and collaborators' person memory study (1993), which was reviewed in the theoretical framework [SEE SECTION 3.2.6.B], the major differences lie in the introduction of explicit impression formation instructions and in the inclusion of much younger participants (i.e., the youngest participants in McAninch et al.'s study were 8-years-old). As mentioned, the authors of this study did not find a better recall either for expectancy-congruent or incongruent information, but their analyses were collapsed across ages (8- to 12-year-olds) and participants were given memory instructions. On the other hand, the liking ratings in the McAninch and collaborators' study revealed both expectancy-based effects and an in-group gender-based favouritism bias. While this bias was

replicated in the present study, the expectancy-based effects were not. However, once again methodological aspects can be at the origin of the disparate findings, since in the McAninch and collaborators' study participants produced the liking ratings twice (i.e., once immediately after the introduction of the expectancy and a second time after the presentation of the behavioural information) and the final ratings may have been influenced by the first.

Finally, a possible perspective on the free recall results obtained in the present study is that the methodological aspects cited earlier would have led more probably to an underestimation of the ontogenetic onset of the abilities to produce an integrated mental representation of someone than to a disruption of the ontogenetic sequence that characterizes the acquisition of such abilities. Therefore, while not denying the methodological questions that should be overcome before drawing solid conclusions, one can still roughly speculate about the possible sequence of events that precede adult-like impression formation skills. From this perspective it seems likely that at first, ontogenetically speaking, the social perceiver does not integrate the different bits of information s/he learns about someone else in a coherent mental representation. It may be the case that young children, having a smaller working memory capacity, process the incoming information in relation to the target (i.e., in terms of the person memory model, form vertical links between the target-node and that the behavioural node) but not in relation to other already stored information (i.e., do not form horizontal inter-behaviour links). At some ontogenetic point, the social perceiver seems to start dedicating differentiated processing to certain kinds of information, as if s/he realizes or contemplates that some types of information may be more diagnostic, in terms of the amount of information they carry, than others. A valid candidate to be the first type of information to become a diagnostic clue in impression formation settings is the valence of the information.¹⁴⁹ Hence, children would start to encode more richly negative information (i.e., creating more inter-behaviour associations), when compared to positive information, which would be consistent with the 7-year-olds' heightened memory for the negative targets and 10-year-olds' better memory for negative behaviours found in the present study. Some point later in the ontogenesis, a specification of the negative as a diagnostic clue would occur, with the social perceiver conceiving of the positive information encountered in the context of a negative prior expectancy as diagnostic as s/he had, in the past, considered all negative information to be. In other words, expectancy-incongruent information would start to be recognized as potentially

¹⁴⁹ Another possible candidate preferred by some authors (e.g., Kinzler & Shutts, 2008) would be the threat/non-threat dimension. Because in the present study the negatively valenced information revolved around the trait *mean*, the two alternatives are viable.

more diagnostic than expectancy-congruent information in impression formation settings. However, this new value attributed to expectancy-incongruent information does not seem to substitute the value previously attributed to negative information, since it is possible to find both the incongruency effect and negativity biases in adults' performances in memory tasks (e.g., Jerónimo, 2007) and it is reasonable to assume that negative and expectancy-incongruent information are important in impression formation for only partially overlapping reasons (e.g., both may be important in terms of accuracy, but negative information may have more survival value).

The speculative ontogenetic sequence outlined in the previous paragraph will be resumed in the general discussion section of this chapter of the dissertation [SEE SECTION 3.4]. Yet, before discussing that idea and other results further, a brief summary of the findings obtained in this set of four studies will be presented next.

3.3.5. SUMMARY

In the empirical studies included in the *data-to-theory* part of the present dissertation, the responses of children and adolescents to incongruent information in impression formation settings were explored. Study 4, using valenced behavioural descriptions, suggests that children in early and middle childhood prefer avoiding cognitive contact with a target described in incongruent terms, while older children and adolescents prefer thinking about this type of target over a congruent target. Study 5, using weakly valenced behavioural descriptions, suggests further that the younger children may still be rather indifferent towards incongruency in impression formation settings, while children in middle childhood dislike it. In this study adolescents and young adults showed (again) a preference for learning more about the incongruent target, and older children's responses were intermediate. Study 6, using trait pairs, reveals that generally younger children reject the existence of people described in incongruent terms and that the acceptance of the existence of such people increases with age. Moreover, the younger children also reject, albeit to a lesser extent, the existence of people described in exclusively negative terms. Finally, Study 7, using the *person memory* paradigm, suggests that the creation of integrated impressions of others, where expectancy-incongruent information is profusely interconnected in the mental representation, has a rather late ontogenetic emergence. This study also indicates that by middle childhood the presence of negative information has consequences for the organisation of the mental representation.

The main goal of the *data-to-theory* part of this research project was to illustrate how research conducted with children can be useful for gathering data that may then be used in the generation of hypotheses about the more automatic processes still operating in adults. This illustration was carried out in the research field of impression formation, more specifically regarding responses to incongruent information, since the study of this kind of information has proven highly fruitful, in the social cognitive literature, for understanding the processes operating in impression formation. Research conducted with adults has shown that social perceivers strive for the coherence of personality impressions and are quite proficient at resolving incongruencies, may they occur within the incoming information or concerning a prior expectancy. However, incongruency resolution seems to depend on fairly complex and deliberate forms of processing. For example, the incongruency effect (i.e., better recall for expectancy-incongruent information) usually is not obtained when the social perceiver is under cognitive strain. Studying children's responses to incongruent information in impression formation settings was thus expected to provide some insights on simpler and less demanding forms of processing incongruent information, which may still be available to adults whenever the cognitive resources and/or the motivation are scant to process the social information in a more complex way.

The set of four studies included in this part of the dissertation allowed tentatively tracing an ontogenetic sequence of responses to incongruent information about someone. If this ontogenetic sequence reflects, as assumed, an ordering of the most simple to the most complex forms of information processing, then the following hypotheses about the adult functioning can be formulated:

- (a) Under severe deprivation of cognitive resources or motivation to process information about someone, incongruent information about that person may not be detected as such. Neglecting certain instances of incongruency may in fact be the simplest way to deal with incongruent information, as novices in chess or political cognition (Chase & Simon, 1973; Fiske et al., 1983), and preschoolers in impression formation settings (Studies 5 and 7) seem to do. Speculatively this *incongruency neglect* can occur because the system under cognitive load is less sensitive to incongruency as a trigger for incongruency resolution (see e.g., Lieberman et al., 2002), because the information is not encoded in an organised representation (and therefore is not incongruent in a strict sense), or both. Furthermore,

from a functional perspective it would make sense that the cognitive system would protect itself from detecting signals (e.g., incongruency) that something needs to be solved, when it has no resources to proceed with the resolution.

- (b) Under these conditions (i.e., massive cognitive load) it is possible that the social perceiver forms a poorly organised cognitive representation of the target-person, where for example the behavioural information is associated with the target, along with eventually inferred characteristics (e.g., traits), but no further organisation is imposed on the representation (see Figure 17 left pane).
- (c) Under non-ideal processing conditions, but when there are more available cognitive resources to process information about someone than in the previous scenario, incongruent information about that person may be avoided. Avoiding incongruent information plausibly implies that the incongruency was detected (like second-graders in Studies 4, 5, and 6) but not fully contemplated as incongruent information. Congruent information is preferentially and more easily processed. Speculatively this *incongruency avoidance* in impression formation settings may be sustained by mechanisms such as the trait inference inhibition process and the search for alternative encodings for expectancy-incongruent information (Jerónimo, 2007).
- (d) Under these conditions (i.e., moderate cognitive load) it is possible that the social perceiver forms a slightly more organised cognitive representation of the target-person, where for example expectancy-congruent behavioural information is more easily processed and eventually organised around the common inferred trait, while the expectancy-incongruent information remains merely associated with the target (see Figure 17 centre pane).
- (e) The processing of negative information would have primacy over incongruent information, so that adults under massive cognitive load would be able to detect the presence of negative information, even if they lack the capacity to process it more extensively (like preschoolers in Studies 4, 6, and 7), and adults under moderate cognitive load would be able to process it more extensively (like 7-year-olds in Study 7).
- (f) Incongruency resolution and highly integrated cognitive representations of a target-person will be accomplished only in the presence of sufficiently available cognitive resources (see Figure 17 right pane).

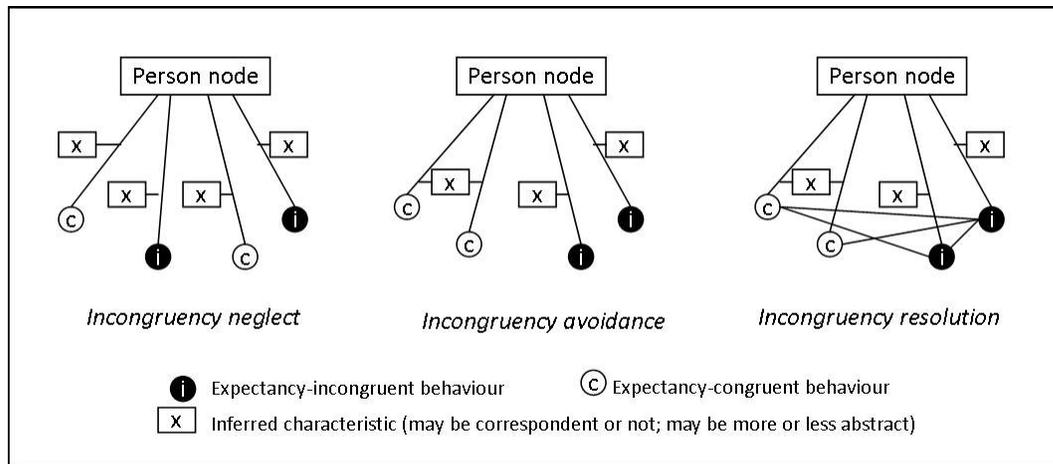


Figure 17: Hypothetical associative networks inspired by the person memory model representing cognitive representations formed under high, moderate, and low cognitive load

Conducting this set of studies with differently-aged participants on a topic that has been widely researched in the social cognitive literature with adults hopefully illustrated two ways, at least, in which this type of experimental population can serve social cognitive theorizing. First, the outcomes of the studies may be used to raise testable hypotheses about the functioning of adult social perceivers when the more demanding, reflective processes cannot be carried out. These hypotheses may then be tested recurring to more conventional techniques to disrupt more deliberate processes, such as manipulations of cognitive load or temporal pressure. Moreover, knowing the ontogenetic sequence allowed for establishing differential hypotheses for differential levels of cognitive load.

Secondly, the outcomes of the studies allowed tracing an ontogenetic sequence, even if tentative, of how the processes studied with adults in the social cognitive literature develop. This knowledge may then be used to assess whether end-state models, such as the person memory model or the TRAP model, have developmental plausibility, that is, whether it is simple (or difficult) to conceive how those models with some modifications could account for the results obtained with children and adolescents.

In spite of the fruitful and promising aspects of the current set of studies, some of the problems already identified in the discussion of the first set of studies [SEE SECTION 2.4] are once again relevant. As before, it cannot be assured that the instructions, stimuli, and measures were identically understood across age-groups. In the present set of studies, the case of the instructions seems to be the most worrisome. As mentioned repeatedly, the studies aimed at collecting children's and adolescents' responses to incongruent information in impression formation settings. For that purpose, at the beginning of all studies, participants received

instructions to form an impression of the target-persons (except the memorization conditions in the last study). It is possible, though, that young children did not understand those instructions the way older children or adolescents did. Another common case refers to the use of the rating scales, in which young children may have response patterns that differ from the ones older children have, independently of what is supposed to be rated. A more detailed investigation on these specific methodological matters would make the substantive conclusions drawn from the results more solid.

Another problem was already discussed regarding the previous set of studies, as well. Namely, from the presently obtained data it is not possible to know whether young children already have the abilities to resolve incongruencies and to form integrated personality impressions, but the experimental tasks consumed too many cognitive resources to put those abilities in motion, or whether children acquire those abilities through development. While this problem is a valid and interesting theoretical question, for the present purposes, namely to gain insights about the less deliberate processing of incongruent information in impression formation settings, the present studies were suitable, independently of which alternative (i.e., differences in resources vs. differences in abilities) may be truer.

On the other hand, the question outlined in the previous paragraph is more consequential if one wishes to speculate about the developmental mechanisms that could account for the age-related differences observed in the present set of studies. As mentioned before [*SEE SECTION 1.2.3*], investigating this kind of mechanisms was not a goal of the present research project. However, the discussion of the results, in which age-related differences were identified, would probably feel incomplete without a mention to possible developmental mechanisms that could account for those changes. Once again, the assumptions of the information processing theories of developmental change (see e.g., Siegler et al., 2006) seem to be sufficient to account for the results obtained in the present set of studies. Young children, who process information slower and hold fewer items in working memory than older children, adolescents, and adults, would have difficulty in resolving incongruencies and creating richly integrated impressions of others because these activities require that a lot of information is brought to working memory simultaneously. With increasing processing capacity and speed, so would children's ability to organise information in a mental representation of someone grow. Simultaneously, the knowledge structures that support impression formation, namely the personality implicit theories [*SEE SECTION 3.2.1.B*], would also become more organised, thus allowing for a more efficient detection of incongruency, and ultimately for its resolution.

Naturally, this reading of the age-related changes under the light of the information processing theories does not intend to preclude the possibility that other developmental mechanisms and principles play an important role, or even a more important role. For example, cultural mediation as proposed by Vygotsky (e.g., 1929) may be central to the development of the skills needed to form an impression of another person that goes beyond the mere tagging of people as potentially threatening or non-threatening to the self, as well as to the construction of the implicit theories of personality. Specifying and testing the role played by these, and other, possible mechanisms for development in impression formation would be an interesting future research possibility by itself.

Another interesting, and related, possibility for future research would be to continue exploring the way child social perceivers form mental representations of others, in greater depth and more comprehensively than in this set of studies. There are some studies in developmental literature that address the problem of how children form impressions of others, but they are either too demanding (e.g., free description studies), do not instruct participants to form impressions (e.g., person memory studies), or focus particularly on other, even if related, processes (e.g., dispositional inference, behavioural prediction, stereotyping).

If the desired illustration, of how studies conducted with children may be useful for raising hypotheses about adults' more automatic functioning, was successful, two specific lines of future research should be the most obvious. One of those lines would be to adopt the present methodology to other areas of study. For example, one could investigate children's decision making, stereotyping, responses to persuasion and to social influence, to name just a few topics, in paradigms more or less close to the paradigms used with adults, in order to generate hypotheses about the automatic processes that may still be operating in the adults' functioning, but that may be usually occluded by more deliberate processing.

The other line of research would consist exactly in testing, with adults, the hypotheses generated in the beginning of this discussion. There are, for example, person memory studies conducted with adults under cognitive load (e.g., Macrae et al., 1999) that suggest that participants in these conditions are not able to resolve incongruencies or to individuate (i.e., form an impression based on personal rather than stereotypic attributes). However, in these studies, one can not tell whether participants treated expectancy-congruent and incongruent information indifferently (as in incongruency neglect) or whether they detected incongruency, but just did not have available resources to resolve that incongruency (as in incongruency avoidance). The data collected in the present part of the dissertation suggest that both types of

processes are viable ways to deal with incongruency when more complex processes cannot be set in motion, and encourage an empirical test.

Tests such as these, namely as the ones mentioned in the last paragraph, would complete one more turn in the spiral and start a new theory-to-data set. Before that happens, it may be a good point to stop and wrap up with a general discussion of the current dissertation.

GENERAL DISCUSSION

When one writes a novel about grown people, he knows exactly where to stop – that is, with a marriage; but when he writes of juveniles, he must stop where he best can.

Mark Twain

4.1.1. DISSERTATION OVERVIEW

The thesis defended in the present dissertation has been that studies conducted with children within a social cognitive framework may be highly valuable for the advancement of social cognitive theory building and testing beyond a strictly developmental scope. This thesis differs somewhat from previous calls, by other authors, that both social cognitive and developmental researchers should pay close attention to the advances achieved by each other (e.g., Pomerantz & Newman, 2000; Ruble & Goodnow, 1998). While this attention to neighbouring branches (and even to remoter fields) of scientific investigation should be a healthy practice of the common researcher, the current thesis argues for the importance of designing studies that are clearly integrative from the outset. The seven studies presented in this dissertation represent illustrations of how this kind of integration may be materialized.

The overarching framework supporting the illustrations was the dualistic view of the architecture of social information processing. This view allows distinguishing between more automatic and more deliberate forms of information processing. Because the more automatic processes are by definition less demanding on cognitive resources and abilities, and because in many dual process models the more deliberate form(s) of processing are assumed to correct, or at least qualify, the outputs produced by the more automatic form(s) of processing, one may expect that the ontogenetic onset of the more automatic processes will precede the onset of the more deliberate ones. Studying the ontogeny of the dual architecture of social information processing becomes, thus, a valuable tool for investigating the dissociation between the two kinds of processes.

The arguments favouring the thesis were woven around two illustrations. The illustration presented in the first part of the dissertation (*theory-to-data*) aimed at showing how studies conducted with children may be used to test dual process models, proposed in their end-state form in the social cognitive literature. In a set of two studies, the three-stage model of person perception (Gilbert, Pelham et al., 1988) was tested using social cognition classical paradigms, such as the silent interview and the attitude attribution paradigms, and children and adolescents from four different age groups as participants. The model was granted with corroborative evidence, but one unexpected finding opened way for further

exploration of other variables involved in dispositional inference, which are not included in the three-stage model. This exploration was conducted in the third study of the set.

The illustration presented in the second part of the dissertation (*data-to-theory*) was dedicated at showing how studies conducted with children may be used to gather knowledge about the operation of the more automatic processes. Children's and adolescents' responses to incongruent information in impression formation settings were collected in a set of four studies. Across these studies different stimuli, kinds of incongruency, and dependent measures were used. The fourth study resumed the use of social cognition classical paradigms, namely the person memory paradigm, and investigated the participants' memory for expectancy-congruent and incongruent information. Because this part of the research project had a rather exploratory nature, more speculation in the reading of the results was afforded, ultimately leading to the generation of hypotheses about the more automatic responses to incongruency in adults.

4.1.2. GOALS AND RESULTS OVERVIEW

As anticipated in the general introduction of this dissertation [SEE SECTION 1.1], and again reminded in the previous section, the presented research served multiple goals. The extent to which the more general aim (i.e., to illustrate how studies conducted with children can be valuable for the understanding of adult social cognitive functioning) could be satisfied, depended on the accomplishment of the two intermediate goals, namely to illustrate this value for (a) theory testing and (b) hypotheses generation. These goals were then materialized in (a) the testing of the three-stage model of person perception (Gilbert, Pelham et al., 1988) and in (b) the collection of children's and adolescents' responses to incongruent information in impression formation settings, and for each one of them a set of studies was conducted, with each particular study pursuing its specific goal. The fulfilment of these goals will be reviewed in the next paragraphs in light of the obtained results.

The aim of the first study, using the silent interview paradigm, was to test the ontogenetic prediction derived from the three-stage model of person perception that while younger children would perform dispositional characterization without situational correction, older children would already be able to perform situational correction. This goal was partially fulfilled, in the sense that although the test seemed adequate and the main results were consistent with the ontogenetic prediction, the results were not totally conclusive. More

specifically, as expected, younger children did not use, and older children did use, the situational information to discount their dispositional inferences. However, the model predicted that the dispositional inferences should be correspondent to the observed behaviour, but younger children's inferences were not aligned with how they categorized the behaviour. Hence, since the goal of the first study was not completely fulfilled, it was resumed in the second study.

The aim of the second study, using the attitude attribution paradigm, was the same as for the previous study. In this study, the bases for drawing a dispositional inference based on prior expectancies were minimized, as it was conjectured that these expectancies may have been responsible for the non-correspondence between observed behaviour and dispositional inference in the previous study. This time the goal was completely satisfied. The results replicated the difference between younger and older children's usage of the situational information to correct the dispositional inferences, without the inconsistencies between behavioural categorization and dispositional characterization. Moreover, the same results were obtained across two completely different samples of participants.

These two studies could have sufficed to illustrate how research with children may be valuably used to test end-state social cognitive models. That is to say that studies such as these may serve not only as an additional tool for model testing, but also as an important source of knowledge about the ontogenetic validity of the models being tested. Consequently, one of the main goals of the current research project was accomplished, namely that of illustrating how studies conducted with children are valuable for testing theories that model the adult social perceiver's functioning. Still, in order to illustrate how studies conducted with children may be used not only to test, but more broadly to inform end-state social cognitive models, a third study was included in this set of studies.

The aim of this third study, again using the attitude attribution paradigm, was to investigate how dispositional prior expectancies impact dispositional characterization across different age-groups, in situations when the behaviour is not informative of the disposition (i.e., when the situation can account for the behaviour). The relevance of the study stemmed from the facts that (a) younger children's dispositional inferences in the first study may have derived more from prior expectancies than from the observed behaviour, suggesting that expectancy-based dispositional characterization is a highly efficient process, and (b) the prior expectancies variable is not explicitly modelled in the three-stage model of person perception. The results of the study, namely that all age-groups drew expectancy-based dispositional inferences even when that meant a non-correspondence with the observed behaviour, strongly

suggest that the prior expectancies variable plays an important and efficient role in dispositional characterization. Hence, this study, by creating an opportunity for conjecturing how prior expectancies should be integrated in the three-stage model of person perception, fulfilled also the broader aim of illustrating the potential of studies with children for informing end-state social cognitive theories.

With the first set of studies (i.e., Studies 1-3), the goal of illustrating the benefits of designing studies with child participants to test social-cognitive theories was satisfactorily accomplished and only modified to encompass the idea that such studies can be also useful for informing those theories. The second set of studies (i.e., Studies 4-7), on the other hand, aimed at illustrating how this kind of study can be valuable for gathering scientific knowledge that can be later used to generate hypotheses about adult functioning or to constrain theory building. The main idea was that less complex and less cognitively demanding processes, as those used by younger children, can still be handling information processing in adulthood whenever the social perceiver does not have the opportunity or motivation to employ more complex or demanding forms of processing.

The aim of the fourth study of the present dissertation was to investigate children's and adolescents' preferences for thinking about congruently or incongruently described persons. The obtained data showed a clear preference for the congruent target among younger children and a linear increase with age in the preference for the incongruent target. However, the aim of this study was only partially fulfilled, in that valence was confounded with the congruency manipulation (i.e., only the incongruent target, but not the congruent one, was described by a negative piece of information).

The fifth study resumed the aim of the previous one, but the targets' descriptions were constructed and pre-tested so that both targets would be evaluated similarly. Again, a linear increase with age in the preference for thinking about the incongruent target was obtained, but this time the youngest children in the sample (i.e., preschoolers) did not show any clear preference for any of the targets, and the marked preference for thinking about the congruent target was replicated only among the slightly older children (i.e., 2nd-graders). With the convergence of the results of the fourth and fifth studies, except for the youngest group whose responses seemed more determined by valence-related than congruency-related aspects, the defined aim of investigating children's and adolescents' preferences for thinking about congruent or incongruent targets was acceptably fulfilled.

The sixth study aimed at probing to what extent children and adolescents would conceive the existence of someone described by incongruent traits, as a way of gathering

more knowledge about how children and adolescents respond to incongruent information in impression formation settings. In consonance with the results of the two previous studies, there was a linear increase with age in the acceptance of the co-existence of incongruent traits in the character of a single person, in most of the cases, and the youngest children's responses seemed more influenced by valence-related than by congruency-related aspects. As such, the goal of this study was also satisfied, in that the results of the previous studies were replicated and extended in meaningful ways.

Although many more pieces of knowledge about children's and adolescents' responses to incongruent information in impression formation settings could be gathered, enough of them were to generate hypotheses about adults' functioning in view of incongruent information in non-ideal conditions for processing. Based on the results of the three previous studies it was hypothesised that incongruency would be neglected by social perceivers who cannot afford to allocate cognitive resources to the creation of a unified mental representation of someone and that it would be avoided by social perceivers who have enough cognitive resources available to detect the incongruency, but still lack resources to integrate it. These three studies, then, were possibly enough to illustrate how research with children may be valuably used to generate hypotheses about adult's more automatic functioning, and furthermore serve the purpose of constraining future theory building, in the sense that any impression formation theory should be consistent with the uncovered age-related differences in the treatment of incongruent information.

However, a final study was added to this set of studies. The seventh study, using the person memory paradigm, aimed at deepening the investigation of children's and adolescents' responses to incongruent information in impression formation settings, but its results could have important implications for the ontogenetic validity of the person memory model (e.g., Hastie, 1980; Srull, 1981). As expected, the advantaged recall of expectancy-incongruent, compared to expectancy-congruent, information (i.e., the incongruency effect) was obtained only in the older children's group, which was consistent with (a) the results of the previous studies indicating that younger children are unprepared to integrate incongruent information in a unified mental representation, and (b) the assumptions of the person memory model in terms of the cognitive demands for integrating expectancy-incongruent information in the mental representation of someone. Once again, it can be considered that the specific goal of this seventh study was also accomplished and that it contributed to the satisfaction of the more general aim.

Summing up, if the first set of studies was successful at illustrating how research conducted with children may be used to test and inform end-state social cognitive theories, and if the second set of studies was successful at illustrating how this kind of studies may be used to collect knowledge for future hypotheses generation or theory constraining, then the general aim of demonstrating the value of studies such as these for the advancement of social cognitive (beyond developmental) knowledge must have been fulfilled, as well.

As discussed in the previous section, the main contribution of the present work to the scientific community is possibly the programmatic and empirical demonstration of a number of ways how research conducted with children may be used for the advancement of general (and not only developmental) social cognitive knowledge: (a) for testing dual-process models, (b) for informing end-state models, (c) for bolstering cumulative knowledge on a specific subject, (d) for generating hypothesis about adult functioning, and (e) for constraining theory building. However, some other contributions of the present work, many of them already pinpointed in other discussion sections along the dissertation, may be appreciated in the next sections.

4.2.1. EMPIRICAL CONTRIBUTIONS

The following paragraphs restate the most salient contributions of the main results obtained in the seven studies.

- (a) *Preschoolers' dispositional inferences about an actor were made without situational adjustment, although the situational constraints were understood (Studies 1-2).* These results contributed to further validate the three-stage model of person perception (Gilbert, Pelham et al., 1988) in that they suggest that using situational information to adjust a dispositional inference is cognitively demanding. Moreover, these results contributed to expand the validity of the three-stage model to the other ontogenetic moments besides adulthood. Finally, these results added one more piece to the developmental debate concerning young children's dispositional inference abilities.
- (b) *Second-graders' and older children's dispositional inferences were well adjusted to the situational constraints (Studies 1-2).* Again, these results contributed as convergent evidence to the validity of the three-stage model by suggesting a later ontogenetic onset of the situational correction process, when compared to the dispositional characterization process. These results also contributed to the developmental knowledge concerning the emergence of the application of the discounting principle, which has been studied in the past (e.g., Karniol & Ross, 1976; Smith, 1975), but with seemingly more complex tasks.

Moreover, these results contribute to qualify the idea that older children are essentially dispositionalists, with limited consideration for situational aspects.

- (c) *Children of all ages, including preschoolers, were able to draw dispositional inferences that reflected the prior expectancy about an actor, even when the observable behaviour was at odds with this expectancy (Study 3).* These results supported the suggestion of adding the prior expectancies variable to the three-stage model of person perception. Moreover, these results help to make sense of inconsistent data about young children's ability to consider situational constraints, when prior expectancies are involved (e.g., Costanzo et al., 1974; Karniol & Ross, 1976).
- (d) *When valence-related aspects were not salient, preschoolers showed no preference for thinking about someone described in congruent or incongruent terms (Study 5).* These results contributed to raising the hypothesis that when the cognitive system is unprepared to deal with incongruent information, incongruity may simply be overlooked. Furthermore, these results represent a contribution to the study of how young children process incongruent information, and form impressions, about someone, since few studies in the literature have done so.
- (e) *Second-graders showed a marked preference for thinking about someone described in congruent terms (Studies 4-6).* These results contributed to raising the hypothesis that when the cognitive system detects incongruent information, but cannot afford to resolve it in a meaningful way, this type of information may be avoided. As in the previous case, these results also add up to the currently scarce developmental knowledge of how children form impressions of others.
- (f) *There was an age-related linear increase in the preference for thinking about someone described in incongruent terms (Studies 4-6).* These results served as convergent evidence for the resource consuming or cognitively complex nature of incongruity resolution processes. Moreover, these results allowed establishing the developmental progression in the willingness to consider incongruent information in impression formation settings in ontogenetic moments that precede adulthood.
- (g) *Ten-year-olds, but not younger children, recalled expectancy-incongruent information better than congruent information in impression formation settings (Study 7).* These results contributed to the investigation of the ontogeny of the incongruity effect. Furthermore, by being consistent with the assumption that integrating expectancy-incongruent items in the mental representation that is being formed is a demanding process, these results also contribute to the validity, including the ontogenetic validity, of

the person memory model and of the TRAP model, which shares many of the assumptions of the person memory model. Finally, these results represent a contribute to the developmental literature on person memory, since this study was the first person memory study to include clear impression formation instructions with children as young as 4-years-old.

- (h) *Preschoolers manifested different forms of a positivity bias across studies.* In Study 1 preschoolers characterized the target-child positively (i.e., as a happy person) rather than negatively (i.e., as a sad person), although they had seen the target expressing sadness. In Study 4 preschoolers evaluated the congruent target in a very positive light (with evaluations decreasing in positivity with age) and did not evaluate the incongruent target negatively, although this target was described with a piece of negative information). In Study 6 preschoolers doubted the existence of a target-child described entirely by negative traits and generally estimated that a lot of people have positive traits, while only some of them have negative traits. Finally, 4-year-olds in Study 7 reported liking the target-children more than any other age group. These results contribute to the collection of instances where young children have shown a positivity bias and, therefore, for the need to theoretically account for such a pervasive bias in young children's person perception. These results contribute also to the suggestion that valence may be one of the earliest factors to impact person perception.

4.2.2. THEORETICAL CONTRIBUTIONS

None of the aims of the work included in this dissertation referred directly to theory building. Still, some theoretical contributions emerged and will be addressed in this section.

- (a) *Prior expectancies as a variable in the three-stage model of person perception.* As mentioned before, the results of the first set of studies of this dissertation suggest that drawing expectancy-based dispositional inferences is a rather efficient process, already mastered by preschoolers, and that prior expectancies may substantially influence the dispositional inference that is drawn. These results are consistent with the findings of previous research on STIs, but prior expectancies about the actor are not modelled in the three-stage model. Hence, one of the theoretical contributions of the present work is the proposal of studying thoroughly the role played by prior expectancies in dispositional

inference and their relation to the other variables of the three-stage model, in order to clarify if and how these expectancies should be integrated in the model.

(b) *Incongruency-neglect and incongruency-avoidance in cognitively overloaded contexts.*

Children's and adolescents' responses to incongruent information in impression formation settings collected in this dissertation allowed outlining hypotheses about the more automatic processing of incongruent information. These hypotheses include the idea of incongruency-neglect under severe cognitive resources deprivation and of incongruency avoidance under moderate cognitive resources deprivation. Other findings in the literature, such as adults' responses to incongruency in cognitive overload situations and novices' responses in expertise domains, are consistent with the formulated hypotheses.

(c) *Young children's difficulty in inference integration, not in dispositional inference.*

One idea that has not yet been put forward, because it stems from the joint consideration of the results obtained in both parts of this dissertation, is that maybe even young children can draw adequate inferences from various pieces of information, but have then a hard time at integrating those inferences in a person perception task. Studies 4 to 7 in this dissertation suggest exactly that young children possibly lack the abilities to integrate different pieces of information in a unified mental representation of someone. Study 2 of the present dissertation and labelling studies in the literature (e.g., Liu et al, 2007) show that young children are able to infer dispositional information from behaviours. Study 3 shows that young children are able to draw dispositional inferences based on prior expectancies, and many studies in the literature show that same-aged children draw situational inferences (e.g., Ross, 1981). It seems, thus, possible that young children draw multiple inferences (e.g., expectancy-based: usually people are happy; behaviour-based: s/he looks sad, s/he must be sad; situation-based: talking about a punishment is sad), without integrating them in a meaningful whole, and will respond with the inference that becomes more salient with the question (e.g., how is she usually? s/he's usually happy). The failure in adjusting the dispositional inference with the situational information (Studies 1 and 2) could be another example of this difficulty in integrating various inferences.

This idea could also contribute to the debate in the developmental literature on whether young children draw dispositional inferences or not. Some studies (e.g., Ross, 1981) have shown that young children are able to draw inferences about an actor from behaviour (e.g., Johnny isn't scared of swinging high, he is bold), but that their behavioural predictions reflect mainly situational inferences (e.g., Johnny would run from the fierce dog). Some researchers have then argued that young children do not draw full-blown

dispositional inferences, because otherwise they should be reflected in the behavioural predictions (e.g., Rholes & Ruble, 1984). Applying the current idea to this debate, it seems possible that young children's multiple inferences (e.g., Johnny is bold; the fierce dog is scary) co-exist in the mental representation without being integrated, and that the reproduced inference will be the one more strongly elicited by the question (e.g., What would Johnny do if the dog would come running up to him?).

(d) *Ontogenetic validity of the three-stage model of person perception and of the person memory model.* As mentioned in the section dedicated to the empirical contributions of the present work, the results of the studies corroborated directly the validity of the three-stage model of person perception and indirectly the validity of the person memory model. Moreover, these results extended the validity of both models to other ontogenetic moments, when the cognitive system is assumed to be not yet fully mature, which may be considered a theoretical contribution.

4.2.3. DESIGN QUALITIES

In this section two design qualities of the studies presented in the dissertation will be briefly discussed as contributions, since those characteristics, when applied to these or other studies, may be considered to contribute to better research practices. One of those qualities was that the many ways in which scientific experimentation can be useful were put to use. As the new experimentalism approach defends, “the main use of experimental results is not necessarily restricted to testing of a given theory; rather, results can have a life of their own and it is this relative epistemic autonomy that allows for scientific progress” (Garcia-Marques & Ferreira, in press). In consonance with this proposal, some of the experiments included in this dissertation were used for theory testing (Studies 1 and 2), but some others were used for generating (inductive) knowledge in a controlled setting (Studies 4, 5, and 6), and still some others for pursuing the implications of previously obtained results (Studies 3 and 7).

Another valuable characteristic of the design of this research project was the inclusion of more than two levels of the focal independent variable, namely the age of the participants. For the reasons explained in the introduction of the first study [SEE SECTION 2.3.1], the inclusion of a group of younger children and another of older children would be sufficient in what concerns the basal assumption of this research project, namely the different ontogenetic onsets of the more automatic and the more deliberate processes [SEE SECTION 1.3.2]. However,

two more age groups, and sometimes three, were added to the experimental design, with at least the following advantages: (a) the (non)-linearity of eventual age-related changes could be observed and tested; (b) the confidence in the meaningfulness of the results was enhanced by the observation of plausible age-related change curves; (c) the obtained results are more restrictive, and thus more informative, for theory building and fitting.

Summing up, the main idea underlying the studies included in the present dissertation was to illustrate the benefits of embracing the defended thesis (i.e., that the ontogenetic inspection of social information processing is useful for end-state social cognitive theory building and testing). However, or exactly for that reason, the contributions of the studies could not be limited to demonstrate how the thesis may be put to the service of research. Hence, the multiple contributions of the studies, including empirical results, theoretical suggestions, and design examples, were highlighted in the previous sections.

Contrasting with the brighter side of the dissertation sketched in the previous sections, there is also a cloudy side, which includes methodological questions, a pervasive and non-tested theoretical assumption, and some other limitations that derive from the restrictions imposed by the aims of the present research project. These limitations will be briefly discussed in the following sections.

4.3.1. METHODOLOGICAL QUESTIONS

The specific methodological aspects that constitute limitations of the presented studies have been addressed in the discussion section of each study, but there is a more general problem, encompassing many of those aspects, that can be restated as follows: the understanding of the instructions, tasks, stimuli, and measures may have differed between age-groups. It is possible that the differences in accurate understanding varied linearly (e.g., preschoolers' understanding of the tasks and measures was more blurry, while ninth-graders' understanding was closer to what was intended by the researchers), but a more worrisome possibility is that for some of the age-groups the experimental material was understood in a substantially different way than for the other age-groups. In this case, the equivalence of the experimental procedure across conditions except for the manipulated material and for other independent variables (e.g., age) could not be assured.

However, as argued before, this problem is not particular to this type of research, since any manipulation that precedes the presentation of the stimuli may differentially affect the perception of those stimuli (e.g., Gilbert, 1998a; Trope, 1986). Moreover, and more importantly, the present studies included more than just the focal dependent measure, and some of these measures provided additional confidence for an adequate understanding of, and equivalent meaning attributed to, the material used in the studies across age-groups (e.g., the *understanding of situational constraints* measure in Study 1, the material pre-tests, the *behaviour explanation* measure in Studies 2 and 5). Finally, it is worth considering that in some of the cases eventual age-related differences in the understanding of the experimental material constituted, in fact, the object of interest (e.g., the understanding of the incongruency in impression formation settings).

In a related vein, it is possible that the level of demand on the cognitive system imposed by the experimental procedure was much higher for the younger groups than for the older groups. However, as discussed before, the present research project did not attempt to differentiate between the use and the possession of a given cognitive ability, and, as such, the validity of the results is not threatened by this possibility.

4.3.2. THE CONTINUITY ASSUMPTION

The problem introduced by the basic and non-tested theoretical assumption that there is continuity between children's and adults' forms of information processing, on the other hand, is harder to dismiss. Influential developmental theories, like Piaget's theory of cognitive development, and some other fairly well-known theories, like Erikson's theory of social development and Kohlberg's theory of moral development, propose that development occurs through a sequence of stages, and that those stages may be characterized by qualitatively different forms of reasoning. This view of developmental changes may easily, although not necessarily, be connected with the idea that earlier forms of reasoning are substituted by more sophisticated forms of reasoning. If such a view is accurate, then the argument that looking into children's responses may be enlightening for understanding adults' more automatic processes would be inconsistent.

However, as discussed in the opening chapter of this dissertation where this assumption was first addressed [SEE SECTION 1.3.2], there is a substantial number of reasons to believe that the continuity hypothesis is highly plausible in a variety of cases. Some of these reasons are, for example: (a) variations between stages can be found in the functioning of the same person depending on the domain (e.g., social and physical domains) and on other variables (e.g., motivation); (b) the stage-theories are not incompatible with the idea of underlying continuity, with discontinuities brought about by new abilities that transform and enrich the previous ones, and some of the theories openly defend this kind of continuity (e.g., Piaget's theory); (c) non-stage theories can account for the observed discontinuities throughout development (e.g., information processing theories of development, neo-piagetian theories); (d) empirical data suggests that "child-like" functioning, such as egocentrism in perspective taking tasks for example, is present, but corrected, in adults; and (e) the evolutionary continuities in the design of new mechanisms.

Nonetheless, there are some cases where more radical discontinuities between children's and adults' forms of information processing are to be expected. One of these cases refers to when a given ability is reduced, rather than improved, across development. For example, it has been shown that infants can discriminate phonemes distinctions that are not used in their native languages, but rather in foreign (unknown to them) languages, while older children and adults have considerably more difficulty in doing so (Trehub, 1976). A similar example is the infants' ability to make the conceptual distinction between objects that fit loosely or tightly to another object, while adult native English speakers, whose language does not make this linguistic distinction, show little sensitivity to the tight-loose fit difference (Hespos & Spelke, 2004). In cases such as these, where language and culture have eroded, rather than enlarged, discriminability, it seems improbable that earlier forms of processing will still be found in adults' functioning. On the contrary, it seems plausible that the cognitive processes were adjusted to their natural environments in order to gain efficiency (e.g., categorizing phonemes as they occur in the native language at the expense of discriminability) and, as such, later ontogenetic forms of processing become more efficient than earlier forms.

Another case where a radical discontinuity between children's and adults' information processing is to be expected is when a given ability is learned, practiced extensively, and automatized, so that it overrides earlier forms of processing. Word recognition in printed format offers a good example of these cases. Until the child learns to read, s/he will not associate meaning with most of the written words and hence, for example, will experience no additional difficulty in naming the colour of the printed word in incongruent trials of the Stroop task (e.g., when the word *green* is printed in red ink). Conversely, child and adult readers experience an interference effect in such trials and are generally unable to *turn off* the word recognition skill that became automatized by reading practice (see e.g., MacLeod, 1991). In these kinds of cases, the learning of a rule or of a set of codes (e.g., reading) alters so profoundly the processing of the stimuli, that it seems again implausible to think that earlier forms of processing of these same stimuli still operate at a very automatic level in adult functioning. Moreover, one can speculate that this kind of discontinuity is particularly probable when a given skill was culturally transmitted and learned, rather than more naturally acquired, through development, as in the reading example. As mentioned earlier, natural systems are not created from scratch, but culturally transmitted tools may have transformational power (e.g., Bruner, 1990).

In cases such as the ones described in the two previous paragraphs, the idea that children's cognitive functioning may be enlightening of the more automatic and basic

cognitive functioning of adults should not be applied. Stereotyping, a research field closer to social cognition than the previous examples, may offer an interesting last example of the just-discussed limitations to the continuity hypothesis. It is possible that, just like phoneme discrimination abilities, the ability to consider people merely as individuals erodes throughout development with the increasing ability of categorizing people across a number of meaningful dimensions. Additionally, the repeated association of the categories with stereotypical contents may fundamentally alter the way particular exemplars are perceived, just as with the printed words after reading is automatized. In this scenario, young children's performances may be of little interest to understanding adults' functioning, in the sense that the earlier forms of information processing ceased to operate.¹⁵⁰

Considering the present dissertation, the continuity assumption seems to constitute more of a limitation to the scope of application of the defended thesis, namely about the value of child studies to social cognitive theory building and testing, than a shortcoming of the presented studies. In the first part of the dissertation, the tested model had a corrective design, which, as discussed earlier [*SEE SECTION 1.3.2*], entails the prediction that the more automatic process does not cease to operate. The second part of the dissertation, on the other hand, focused on the processing of incongruent information in impression formation settings, and it was known in advance that adults' incongruency resolution skills do not override other forms of processing in terms of efficiency, based on empirical results showing different consequences according to whether adults processed incongruency under cognitive overload conditions or not. Hence, in both sets of studies the conditions for the application of the continuity assumption seem to have been satisfied, even if not certified.

4.3.3. DEVELOPMENTAL QUESTIONS

Finally, there is a class of limitations of the present dissertation that should not be conceptualized as weaknesses of the research project, since they derive from its goals, but that constitute certainly restrictions of the current work. For example, the study of age-related changes elicits frequently the wish to understand the developmental mechanisms that underlie those changes. However, the investigation of such mechanisms lies beyond the designated scope of the present work. Some speculative ideas about the adequacy of the information

¹⁵⁰ Nevertheless, young children's performances may be valuable to understand adult's novice functioning, even in this scenario (e.g., to understand novel stereotype acquisition).

processing theories of development to account for the obtained age-related changes were put forward in the discussion sections of both parts of this dissertation, but the presented work cannot answer questions about developmental mechanisms.

In a related vein, the results enclosed in this dissertation are not adequate for estimating the age of emergence, or consistent application, of some given cognitive abilities (e.g., situational correction of dispositional inferences, incongruency resolution), or to answer other questions that may be of primary interest for developmental research.

On the other hand, the appealing side of this kind of limitations is that they open way for future research. The next section addresses some of these ideas.

At least two classes of ideas for future research derive from the work presented in this dissertation: (a) research aiming to follow up on the concrete obtained empirical data, and (b) research inspired by the conceptual thesis defended in the dissertation. A non-exhaustive set of ideas for future studies will be put forward, or restated, for each one of these classes of possible directions.

4.4.1. FOLLOW-UP STUDIES

Regarding the ideas on more immediate follow-up studies, some of them are directed towards studies with adults and some others to studies with children. As suggested in the discussion of the first part of the dissertation, the role played by prior expectancies about the actor on dispositional inference and its interactions with the role played by confirming, disconfirming, and irrelevant behavioural information, as well as with the role played by situational information, could be studied in a more programmatic way with adults, both in settings of cognitive resources availability and scarcity. The intuition behind this suggestion derives from the results of Studies 1 and 3, which seem to indicate that young children (i.e., preschoolers) are able to draw dispositional inferences aligned with prior expectancies even when the behavioural information counters these expectancies, implying that expectancy-based inferences should be quite efficient.

More specifically, the suggestion would be, for example in the silent interview paradigm, to manipulate (a) the congruency of the prior expectancy about the actor (e.g., children are not feeble) with the observed behaviour (e.g., a child with a tired or a fresh expression), (b) the extent to which the situational information could account or not for the behaviour (e.g., interview made immediately before or after playground time), (c) the amount of available cognitive resources, (d) and to measure dispositional inferences (e.g., on characteristics such as feeble, active) based solely on one of the variables or in any combination of the three variables. While the correspondence bias was obtained even with expectancy-incongruent behaviours (e.g., Jones & Harris, 1967), and thus a tired-looking child after playground time may be considered feeble, manipulating and measuring the impact of the mentioned variables could help enlightening exactly how dispositional prior

expectancies should be modelled in the framework of the three-stage model. If expectancy-based inferences are indeed efficient, they should not be disrupted much by cognitive overload conditions (conversely to the situational correction stage) and should contribute to the characterization stage, either by altering behavioural categorization, by contributing alongside the behaviour-based inferences, or by triggering a more attributional, rather than dispositional, inference process when there are expectancy-behaviour inconsistencies (Hamilton, 1998).

Another set of possible studies to be conducted with adults would test the hypotheses generated in the second part of the dissertation, namely whether adults in non-ideal information processing contexts fall back on incongruity neglect or avoidance forms, as differently-aged children seem to do. Studies 4 to 7 suggest that young children (i.e., preschoolers and second-graders) have difficulties in integrating incongruent information about someone in a coherent mental representation, and that they either build non-integrated representations or leave the incongruent information non-integrated with the rest of the information. Testing whether these forms of social information processing subsist through adulthood would contribute to cumulative knowledge on impression formation processes and also to further inform theoretical models.

One possible idea for a study would be to adapt the paradigm of Studies 4 and 5 of this dissertation for its use with adults under cognitive no-load and overload conditions. A set of target-pairs would be presented by brief congruent or incongruent (valenced or neutral) sketches, and the participant would have to choose at each trial which one of the targets s/he would like to know more about. While in the no-load conditions participants would presumably choose the incongruent target more often (replicating the older participants' choices in Studies 4 and 5), it would be interesting to find out whether they would choose the congruent target more often in the intermediate overload conditions (i.e., incongruity avoidance) and near chance level under severe overload conditions (i.e., incongruity neglect), or not.

Another possible idea would be to use a more Asch-like task (1946) and to introduce cognitive overload at the moment of the presentation of the behaviours purportedly done by the target-person. Then participants would produce brief impression sketches about the target, and the references to incongruent material could be inspected in these sketches (e.g., in terms of integration in the impression). The prediction would be that participants who encoded the material under cognitive overload would have formed a less integrated mental representation,

and although integration processes could occur retrospectively at the moment of the sketch production, their sketches should still rate lower on interconnectedness.

As for follow-up studies that are more developmental in nature, relevant suggestions would be, as noted in the preceding section, the exploration of developmental mechanisms involved in the observed age-related changes in both parts of this dissertation. Such studies would aim at answering the question of what allows older children to take situational information into account while formulating dispositional inferences: is it an increase of processing capacities, the extraction of a rule (e.g., discounting principle), the learning of a socially shared belief, a more global reformulation of the reasoning abilities? Similarly, such studies would try to uncover which mechanisms underlie the increasingly sophisticated responses to incongruent information in impression formation settings, including better recall of expectancy-incongruent material: again, is it an increase of processing capacities, the maturation of the implicit theories of personality, a more direct socially mediated learning, or a more global reformulation of the reasoning abilities?

Some of these hypotheses could be assessed, for example, by measuring participants' processing capacity or testing their reasoning abilities in an independent task, and considering those results as covariates in the focal measures data. Although this kind of data cannot assure causality (e.g., that it is the increase in processing capacity that leads older children to resolve incongruencies), it can be used to discard some of the hypotheses (e.g., if processing capacity does not mediate incongruency resolution, then probably it is not the focal developmental mechanism). Some other hypotheses, on the other hand, would require more tailored solutions, like investigating whether the child had explicitly learned that when two causes are possible they should be discounted, or that expectancy-incongruent behaviours done by someone should not be discarded but explained.

Moreover, developmental follow-up studies could aim to define a more precise age of emergence, or consistent application, of abilities such as the situational correction in dispositional inference and incongruency detection and resolution in impression formation, as well as a more exhaustive outline of the developmental acquisition sequence. For these aims, the studies should contain more, closer, and better-defined age-groups than the studies presented in the current dissertation.

A final idea for a follow-up study concerns the hypothesis raised in the section dedicated to the theoretical contributions of the present work, which was inspired by the results of both sets of studies. Briefly, this hypothesis stated that young children draw adequate inferences from different types of information (e.g., dispositional prior expectancies,

behaviours, situations), but have difficulties in adequately integrating those inferences. This idea could be further explored by asking children to produce different inferences, in a common paradigm (e.g., the silent interview paradigm), based on just the sight of the target (prior-expectancies), on the target's behaviour, on situational information, or on dispositional information. Not only could those types of information be manipulated, but also, and importantly, the type of inference that would be asked, like in Krull's (1993) paradigm (e.g., "How is the target usually like?", "What was the target talking about?", "How did the target look like while talking?"). The multitude of inferences could then be inspected in terms of which remain rather stable across age-groups, how the different types of information are combined at each age-group, and eventual age-related differences in the integration of the different pieces of information. The prediction would be that simple inferences based on one type of information (e.g., a dispositional inference based on behaviour) would vary little across age-groups,¹⁵¹ while more complex inferences which require the integration of different pieces of information (e.g., a behavioural prediction based on dispositional and situational information) would show the more substantive age-related changes.

4.4.2. EXTENSION STUDIES

However, if this dissertation was successful at arguing that studies conducted with children may be of great value, not only for developmental research, but also for advancing knowledge on adult social cognitive functioning, the most interesting future directions inspired by the work presented in this dissertation would be the ones that make use of that idea. For instance, observing children's responses in social cognitive paradigms may be highly useful for a better understanding of the mechanisms involved in effects obtained with adult participants. A study like this would, for example, explore the ontogeny of the links between physical and psychological warmth. Adults have been shown to evaluate a target-person as psychologically warmer, after they had been primed with physical warmth by holding a warm cup of coffee (Williams & Bargh, 2008). One possibility is that this link between the two kinds of warmth emerges because of the ontogenetic early association of the warmth of the caregiver's body with feelings of connectedness and trust. If this is the case, then a similar priming effect should be obtainable with young children.

¹⁵¹ Except maybe for manifestations of a positivity bias in young children.

In a related vein, exploring the ontogenetic validity of models proposed in their end-state in the social cognitive literature may be considered a promising avenue for extending cumulative, in contrast to disperse, knowledge in psychological investigation, as well as for refining those same models. Consider, for example, the MODE (Motivation and Opportunity as DEterminants) model of the attitude-behavior processes (Fazio, 1990). This model posits that attitudes will influence behaviour either in a more deliberative way (e.g., as one dimension that the individual will use to weight alternatives of action) or in a more spontaneous way (e.g., by influencing how the individual perceives the event). The extent to which the individual will engage in the deliberative attitude-to-behaviour process is a function of his/her motivation and opportunity to do so. Moreover, the model proposes that, when the individual is processing spontaneously, highly-accessible attitudes will result more often in consistent behaviours, than when the attitudes are less accessible in memory. Because the outline of the deliberative process in this model includes complex cognitive abilities (e.g., anticipation of the consequences of behaviour, consideration of behavioural alternatives, information scrutiny) and because availability of cognitive resources is one of the prerequisites for the operation of the deliberative processing, young children's responses should reveal the spontaneous processing to a much higher extent than the deliberative processing. Therefore, it should be possible to observe in the same paradigm behaviour that is consistent with the attitudes, moderated by attitude accessibility, among young children, even when motivated to avoid a certain kind of behavioural outcome, concomitantly with behaviour that is constrained by outcome considerations among older children.

At this point, many other studies could be imagined as possible future directions, and it is possible that the assessment of the true value of the thesis presented in this dissertation depends much more on those future studies than on the set of seven studies herein included. Let us, thus, give way to those brand new studies.

In a nutshell, in the last 300 pages or so, I have been arguing for the importance of not forgetting that butterflies were once caterpillars and for the value of including studies conducted with children in the social psychologist research toolbox. But I have omitted one of the most captivating features of conducting studies with children: they are possibly the only experimental participants that will beg you to participate in another study.

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LIST OF APPENDICES

Appendix A: Sample still images taken from the female and male versions of the *sad child* videos (Study 1)

Appendix B: Pre-test of the *sad child* videos (Study 1)

Appendix C: Exemplar of the coding sheets for Study 1

Appendix D: Pilot study of the pictorial scales used in Study 1

Appendix E: Outputs of Study 1

E1: Statistical outputs for the *dispositional ratings* measure (Study 1)

E2: Statistical outputs for the *behavioural predictions* measure (Study 1)

E3: Distributions of the ratings in the *understanding of situational constraints* measure (Study 1)

Appendix F: Stimuli used in Study 2

F1: Storyboard and script of the animation (Study 2)

F2: Exemplars of the cards and text used in the introduction of the characters (Study 2)

Appendix G: Exemplar of the coding sheets for Study 2

Appendix H: Outputs of Study 2a

H1: Statistical outputs for the *dispositional ratings* measure (Study 2a)

H2: Verbatim answers given in the *behaviour explanations* measure (Study 2a)

Appendix I: Outputs of Study 2b

I1: Statistical outputs for the *dispositional ratings* measure (Study 2b)

I2: Verbatim answers given in the *behaviour explanations* measure (Study 2b)

Appendix J: Stimuli used in Study 3

J1: Storyboard and script of the animation (Study 3)

J2: Exemplars of the cards and text used in the introduction of the characters (Study 3)

Appendix K: Exemplar of the coding sheets for Study 3

Appendix L: Outputs of Study 3

L1: Statistical outputs for the *dispositional ratings* measure (Study 3)

L2: Verbatim answers given in the *justifications* measure (Study 3)

Appendix M: Stimuli used in Study 4

M1: Exemplars of the cards and text used in the introduction of the characters (Study 4)

M2: Final story (Studies 4 and 5)

Appendix N: Exemplar of the coding sheets for Study 4

Appendix O: Outputs of Study 4

O1: Frequencies for the *cognitive contact* measure (Study 4)

O2: Statistical outputs for the *social contact* measure (Study 4)

O3: Statistical outputs for the *evaluative ratings* measure (Study 4)

O4: Correlations between measures (Study 4)

Appendix P: Images and script of the presentation for Study 5

Appendix Q: Pre-test of the congruent and incongruent targets' perceived sociability and intelligence (Study 5)

Appendix R: Exemplar of the coding sheets for Study 5

Appendix S: Outputs of Study 5

- S1: Frequencies for the *cognitive contact* measure (Study 5)
- S2: Statistical outputs for the *social contact* measure (Study 5)
- S3: Statistical outputs for the *evaluative ratings* measure (Study 5)
- S4: Correlations between measures (Study 5)
- S5: Verbatim answers given in the *behaviour explanations* measure (Study 5)

Appendix T: Exemplar of the coding sheets for Study 6

Appendix U: Outputs of Study 6

- U1: Statistical outputs for the *frequency estimates of co-occurrence* measure (Study 6)
- U2: Statistical outputs for the *frequency estimates of individual traits* measure (Study 6)
- U3: Verbatim answers given in the *co-occurrence explanations* measure (Study 6)

Appendix V: Pre-test of the nice and mean behaviours (Study 7)

Appendix W: Photos used in Study 7

Appendix X: Instructions and coding sheets used in Study 7

Appendix Y: Outputs of Study 7

- Y1: Intrusions in the *free recall* measure (Study 7)
- Y2: Statistical outputs for the *free recall* measure (Study 7)
- Y3: Statistical outputs for the *preponderance estimates* measure (Study 7)
- Y4: Statistical outputs for the *liking ratings* measure (Study 7)
- Y5: Correlations between measures (Study 7)