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Rescuing Emotional Intelligence from the Curse of Fragmentation:

Towards an Integrative Framework

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Resumo

A evolução das publicações sobre Inteligência Emocional (IE) mostra um interesse crescente neste tópico, tanto na literatura científica, como popular. No entanto, a ausência de uma abordagem consensual de conceptualização e medição traduz-se em três pressupostos que prejudicam a construção do conhecimento. O primeiro é o de que as abordagens existentes são mutuamente exclusivas; o segundo assenta na ideia de que é inevitável este tipo de constructo ser demasiado inclusivo; e o último assume que a IE é redundante face a outras variáveis na predição de resultados importantes para os indivíduos e as organizações. O presente trabalho desafia estas suposições (a) propondo uma estrutura integrativa que inclui as principais abordagens de estudo da IE numa estrutura multicamadas; (b) propondo e testando empiricamente os componentes-chave que medem os aspectos essenciais da IE; e finalmente (c) usando modelos não-lineares para testar empiricamente o valor acrescentado da IE enquanto mediadora entre a personalidade e resultados relevantes, como o sucesso académico, empenhamento no trabalho e comprometimento organizacional. Os resultados indicam que é possível encontrar um modelo válido de componentes-chave para conceptualizar a IE de uma forma parcimoniosa (estudos 1 e 2) e que, além de estar significativamente relacionada com a saúde numa revisão meta-analítica (estudo 3), a IE prediz o sucesso académico (estudo 4), o empenhamento no trabalho e o comprometimento organizacional (estudo 5) acima da personalidade. Globalmente, o presente trabalho destaca a necessidade de construir conhecimento convergente neste campo de pesquisa e explorar modelos não-lineares para melhor compreender a sua natureza e dinâmica.

Palavras-chave: Inteligência emocional, personalidade, saúde, desempenho académico, bem-estar, empenhamento no trabalho, comprometimento organizacional, meta-análise, não-linear.

Códigos de classificação: 3120 Traços e processos de Personalidade; 3660 Comportamento Organizacional

Abstract

The evolution of publications on Emotional Intelligence (EI) shows an increasing interest in this topic, both in the popular and scientific literatures. However, the absence of a consensual conceptualization and measurement approach translates into three assumptions that are hampering knowledge building. The first is that the extant approaches are mutually exclusive; the second is based on the idea that over inclusiveness is inevitable in this sort of constructs; and the last assumes that EI is redundant with other variables in the prediction of important outcomes for individuals and organizations. The present work challenges these issues by (a) proposing an integrative framework that includes the main approaches to the study of EI in a multi-layer structure; (b) proposing and empirically testing the core components that measure the essential aspects of EI; and finally (c) using nonlinear models to empirically test the added value of EI as a mediator between personality and relevant outcomes such as academic success, work engagement and organizational commitment. Results indicate that it is possible to find a valid core components model to conceptualize EI in a more parsimonious way (studies 1 and 2); and that besides being significantly associated with health in a meta-analytic review (study 3), EI predicts academic success (study 4), work engagement and organizational commitment (study 5) over and above personality. Overall, the present work highlights the need to build convergent knowledge in this research field and to explore nonlinear models to better grasp its nature and dynamics.

Keywords: Emotional Intelligence, personality, health, academic performance, well-being, work engagement, organizational commitment, meta-analysis, nonlinear.

Classification codes: 3120 Personality Traits & Processes; 3660 Organizational Behaviour

Introduction

"The more we learn about the world, and the deeper our learning, the more conscious, specific, and articulate will be our knowledge of what we do not know, our knowledge of our ignorance. For this, indeed, is the main source of our ignorance - the fact that our knowledge can only be finite, while our ignorance must necessarily be infinite."

Karl Popper

Karl Popper sustained that even when a scientific hypothesis has been successfully and repeatedly corroborated, it was not necessarily true. Instead it had simply not proved false, yet! This became known as the theory of falsification. He called for a clear demarcation between good science, in which theories are constantly challenged, and what he called "pseudo sciences" which couldn't be tested.

Very recently, Damásio (2011) also acknowledged the limitations of science and considered himself a sceptic regarding the scientific presumption of objectivity. It's his belief that one should not take scientific results as anything more than preliminary conclusions that can be dismissed as soon as better ones are found. But, as the author notes, this does not lessen the enthusiasm for the attempt to improve preliminary conclusions.

Considering the extant body of knowledge and scientific outputs as regards Emotional Intelligence (EI), it is most common to observe a positivistic and non-popperian attitude in which results are taken as *the* truth and not *a* truth. This attitude favoured fragmented views, diverging findings, and research lines that overall fail to interact as apparently they either ignore or criticise each other without a dialectical standpoint, without a search for a synthesis. Therefore, it is our belief that there is a need to change the status quo. It is with this belief in mind that we set ourselves the challenge of approaching EI from an alternative standpoint, one that breaks with some of the assumptions underlying the mainstream research.

General purposes and structure

The main goal of the present work is to explore and extend previous research on EI by challenging three assumptions that seem to be slowing down progress in this area. The first deals with the notion that fragmentation is inevitable, given that different approaches to EI exist, which are typically at odds. The second is related to the tendency for some EI models to be over inclusive, thus increasing the risk of overlapping with prior psychological constructs and reducing EI's added value. Finally, researchers tend to study EI in an isolated and linear

manner, overlooking its potential role as an explanatory mechanism in the processes that link other relevant predictors to the intended outcomes and also failing to capture potentially curvilinear and more realistic patterns of relationships.

In response to these debatable assumptions we aim to tackle the following challenges: (a) to find an integrative framework that includes the main EI approaches within a coherent structure in an effort to overcome the issue of fragmentation; (b) to propose and test a model that captures the core components of EI and thus avoids the risk of creating an all-encompassing and meaningless redundant construct; and (c) to extend previous findings regarding the added value of EI by testing its potential role as a mediator in the processes involving other relevant variables using a nonlinear approach, in an effort to better capture the actual patterns of relationships.

To accomplish these specific goals we will critically review the relevant literature in this area that support our proposals and discuss the main findings of our research. We have structured the present work in five chapters beginning with a brief contextualization of EI in the broader domain of the study of emotions in organizations. In the first chapter we also present data illustrating the growing interest in this research topic, both inside and outside the academia. In the second chapter we start by introducing the cornerstones of its historical origins to better understand EI's emergence, followed by a critical review of its major theoretical and measurement approaches. Finally, we will also look at its neurological bases, in order to illustrate its potential biological fundaments.

In the third chapter we present EI's key research streams to better understand it's positioning relative to other established constructs, setting the stage for our proposals and empirical studies addressing the above mentioned challenges of fragmentation, over inclusiveness and linearity. The first proposal is more theoretical in nature and advocates an integrative framework that arranges the main EI approaches within a multi-layer structure. The second is also at the theoretical level and suggests that it is possible to extract from the existent models a more parsimonious model to conceptualize EI by focusing on its core components. This proposal is complemented with two empirical studies testing its validity (studies 1 and 2).

The last proposal advocates that nonlinear relationships are more realistic in this area given the nature of the variables involved and is explored in the subsequent chapters with two empirical studies based on nonlinear techniques. More specifically, the fourth chapter examines two important EI's implications for individuals, namely health and academic success. We start by presenting our meta-analysis regarding the relationship between EI and

health (study 3) and then we present our findings regarding EI's effect on academic performance and well-being, taking personality in to account and using on a nonlinear approach (study 4).

Finally, the fifth chapter begins with an overview on research regarding EI's main implications in the organizational context and then presents our empirical study examining the effects of EI on work engagement and organizational commitment, taking personality in to account and using on a nonlinear approach (study 5). Following the last chapter we will finish with a general conclusion reviewing the key aspects of this work and discussing its main contributions.

Chapter 1 – Embedding EI in the study of Emotions in Organizational Behaviour

This chapter offers a brief contextualization of research on emotion in organizational behaviour, before going into the specific topic of EI. We will start by reviewing some attempts to define emotions and then we will present a multi-level model of emotions that contextualizes the study of EI in organizational settings. Finally, we will give an overview of the current status of this research topic in order to better grasp its relevance.

1.1 Defining Emotions

Etymologically, the word emotion comes from Latin *emovere*, which is a combination of *ex* (out or outward) and *motio* (movement or action) and it means to move out or prepare for action. Defining emotions is a challenging enterprise, as Izard (2010) recently showed based on a qualitative analysis of 34 emotion experts' answers to a survey on this topic. This study found little consensus on the number and content of emotion components among renowned scientists in this area of research. The number of categories ranged from three to 11 and the percentage of agreement ranged from 0% to 54%, with a mean of 25%. Nevertheless, there was reasonable consensus on the structures and functions of emotions that configure the following description: "Emotion consists of neural circuits (that are at least partially dedicated), response systems, and a feeling/state process that motivates and organizes cognition and action. Emotion also provides information to the person experiencing it, and may include antecedent cognitive appraisals and on-going cognition including an interpretation of its feeling state, expressions or social-communicative signals, and may motivate approach or avoidant behaviour, exercise control/regulation of responses, and be social or relational in nature" (p. 367). According to the author this represents a multifaceted description of emotion, instead of a definition, implying that it has different aspects or meanings equally valuable for research that complement each other. Consequently, experts agreed that researchers should specify the meaning they endorse to avoid ambiguity, even when examining discrete emotions.

Overall, according to Izard (2010), there seems to be considerable agreement on the idea that emotion is important to personal and social adaptive behaviour, despite the difficulty in finding a common definition. Finally, he advises adopting a discrete emotions approach, given that it is easier to define joy, sadness, fear, anger and guilt, than the general term "emotion". Another interesting suggestion is to use it as an adjective (e.g., emotion knowledge, emotion regulation) to facilitate clarity in this research field.

Salovey & Mayer (1990) provided the following definition of emotions in their first paper on EI: "organised responses, crossing the boundaries of many psychological subsystems, including the physiological, cognitive, motivational, and experiential systems. Emotions typically arise in response to an event, either internal or external, that has a positively or negatively valenced meaning for the individual. Emotions can be distinguished from the closely related concept of mood in that emotions are shorter and generally more intense". (p. 186). This definition clearly views emotions as having positive and adaptive functions in people's lives.

Later, the authors presented a conception based on the following premises, which seem to complement their first definition: (a) each kind of emotion (anger, fear, etc.) shares certain essential features that are biologically based, (b) simpler emotions may combine to form more complex emotions, (c) emotions may be regulated but not fundamentally altered by display rules, (d) emotions have the functional purpose of signalling relationships and changes in relationships, real or imagined, principally between people and their environments (including other people), and (e) emotions and cognitions represent different functions of the mind, if not the brain, recognizing that the two often interact and are expressed in an integrated form (Mayer, Salovey, & Caruso, 2004, p.250).

Overall, there is no single consensual definition of emotion although researchers agree upon a certain set of propositions. Namely, the dependence on underlying biological brain structures, a functional view of emotions in favouring coping mechanisms and survival answers, and a discrete nature of emotions (i.e. each emotion considered separately) that justifies its use as an adjective rather than a noun.

1.2 A Multi-level Model of Emotions in Organizations

Emotions are an essential part of people's and organizations' lives, yet research has focused predominantly on cognitive rather than affective phenomena, or on its relationships. After a long period of inattention, research on emotion in organizations got into the spotlights, especially over the past 15 years, and is now considered a part of an "affective revolution" in organizational behaviour (Ashkanasy & Humphrey, 2011).

With the explosion of interest in this area of research, and the diversity of topics pursued by different scholars, a systematized framework was in need. To deal with this challenge, Ashkanasy (2003) proposed a multi-level model of emotion in organizations, recently used to offer a summary of existing research on emotion in organizational behaviour (Ashkanasy & Humphrey, 2011). This model has the advantage of providing a framework for

those who study in this area and it is structured in five levels, as shown in *Figure 1* (adapted from (Ashkanasy & Humphrey, 2011).

Level 1 refers to within-person emotional variation and focuses on time variations of emotions and mood, experienced by the individual at work (e.g., affective events theory); Level 2 refers to between-persons emotional variation, focusing on individual differences and attitudes (e.g., emotional intelligence, organizational commitment, trait affectivity and job satisfaction); Level 3 focuses on the interpersonal interactions and involves display and communication of emotion in dyadic encounters (e.g., emotional labour, emotional communication); Level 4 refers to group interactions and focuses on leadership and teams (e.g., group affective tone, emotional contagion and group emotional intelligence); Level 5 refers the organization as a whole and includes interactions at the lower levels (e.g., emotional climate). Given that this level includes the interactions at the lower levels, it is qualitatively different from the other levels. We chose the stacked Venn diagram to depict this model, although not originally proposed by the authors, in order to express this progressive inclusiveness and complexity from the within-person micro level to the organizational macro level.
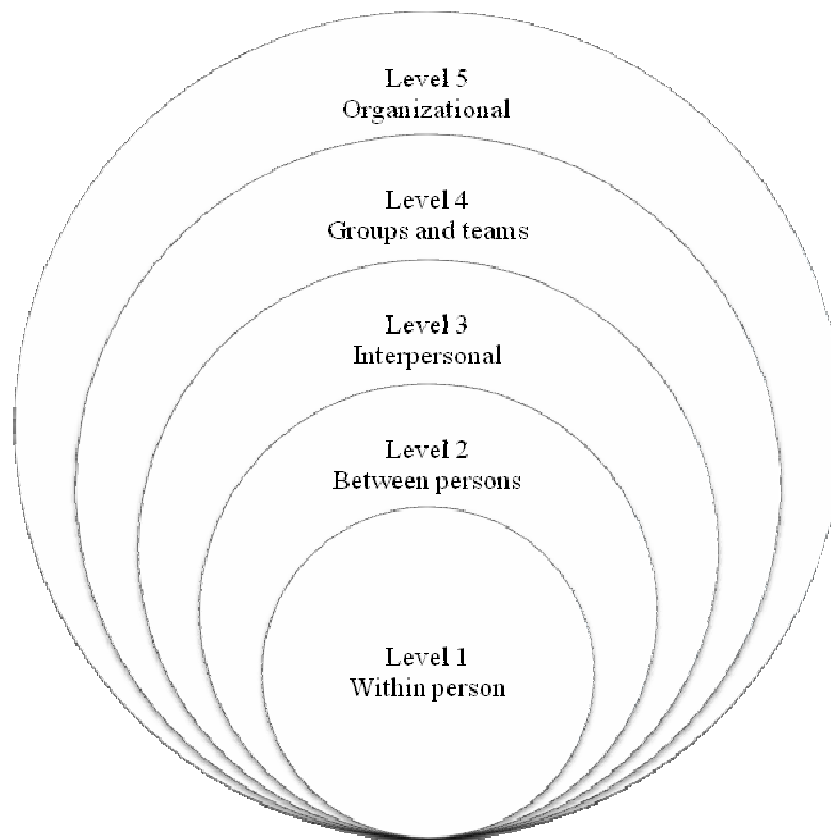
Figure 1. The Five-Level Model of Emotion in Organizations

In sum, it is important to note that the present research places itself at the 2nd level of the Ashkanasy and Humphrey's (2011) model, which implies that the conceptual range of emotions under study is of a subjective nature in a context of social interaction, and therefore may not be taken as objectifiable as the noun "intelligence" may suggest.

1.3 The Relevance of EI as a Research Topic

Emotional intelligence is a relatively new research field, systematically studied only after the 1990s. In the last two decades it has attracted considerable attention evidenced by the rapidly growing number of studies and publications dedicated to it. A search conducted in Google Scholar using the keyword "Emotional Intelligence" in the title until 31st December 2012 returned 3,940 hits (excluding citations and patents). A similar search for this topic in ISI Web of Knowledge returned 2,283 references from as early as 1966 to the present days, showing an exponential increase in publications, particularly in the last decade (see *Figure 2*).
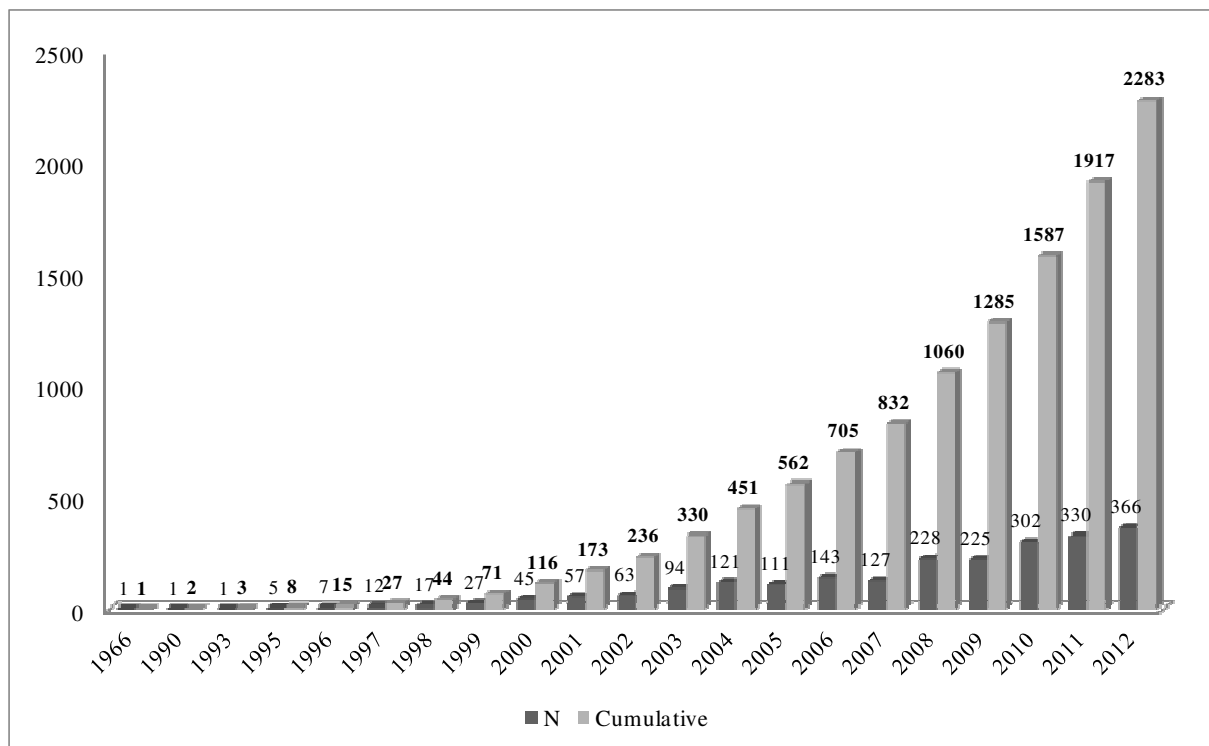
Figure 2. EI Publication Evolution

The growing interest in this topic is also present in the dissertations and theses publication. A search in December 2012 in the ProQuest database returned 139 results referring to "Emotional Intelligence" in the abstract, from 2000 (5 records) to 2010 (10 records), with a maximum of 21 records in 2009 (see *Figure 3*). Most of them (125) were

developed in the area of management (of which 48 related EI with leadership), 59 were related with occupational psychology, 27 with EI training and education, and 10 were developed within the healthcare domain. Overall, we can say that this is a promising new area of emerging interest in the scientific domain.
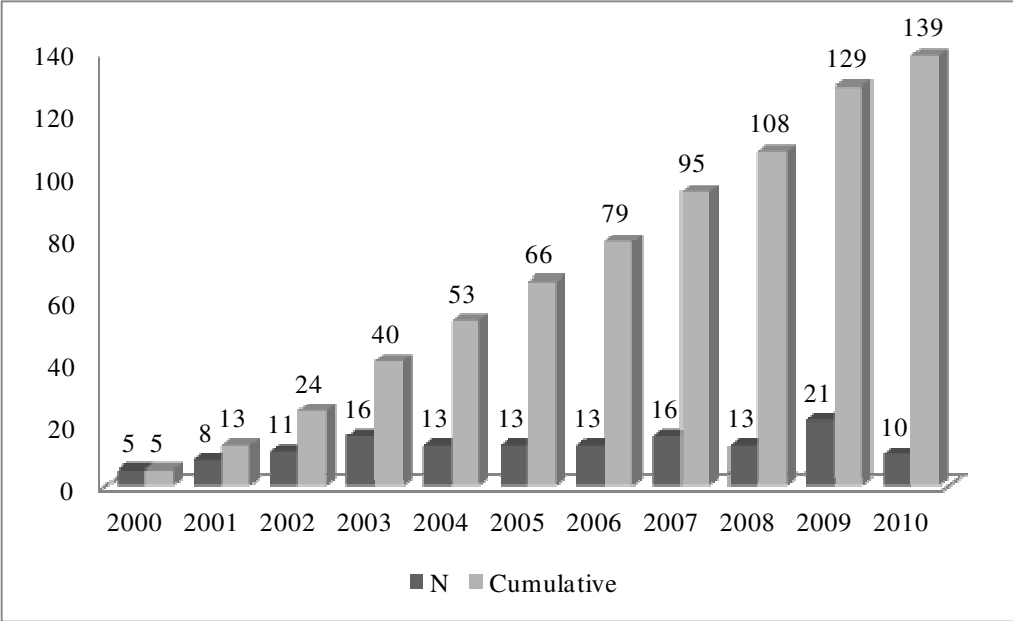
Figure 3. EI Dissertations and Theses

From the total amount of scientific publications shown in *Figure 2*, most of them were articles (66%), followed by proceedings' papers (15%) and meeting abstracts (10%), as shown in *Figure 4*. Considering only articles and reviews, we have found a total of 1,591 peer-reviewed journal papers, representing 89% of the publications.
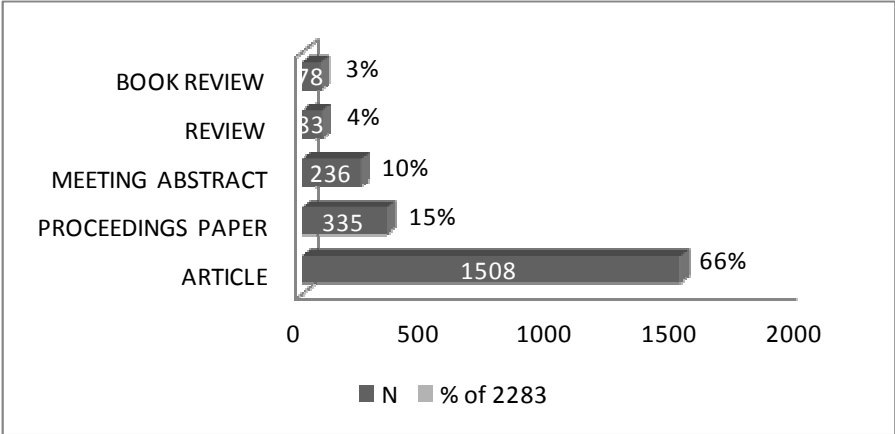
Figure 4. EI Publications by Type

Figure 5 depicts the top 10 most representative research areas within the 1,591 peer-reviewed journal papers. As shown, the most expressive number of this kind of publications is in the area of Psychology (59%), followed by Business/Economics (19%) and Education (9%). Curiously, this subject was explored by researchers from unanticipated and completely different disciplines such as Engineering and Computer science.
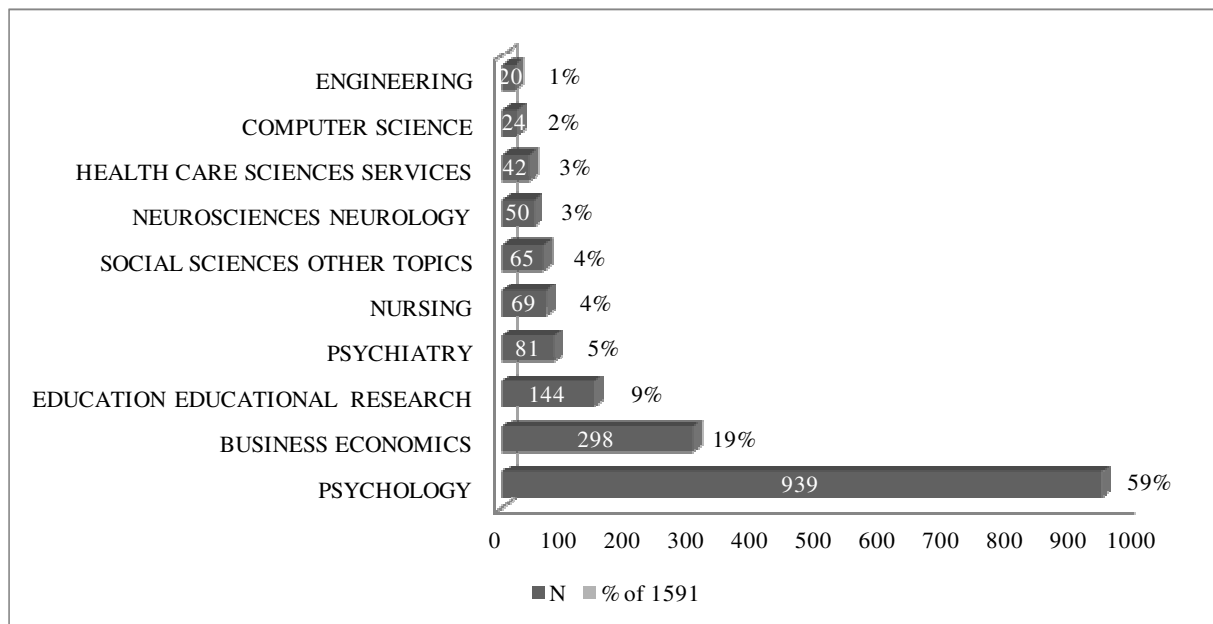
Figure 5. EI Journal Articles by Research Area

Figure 6 displays the distribution of the 1,591 journal papers within the top 10 countries, showing that most originated from the USA (38%), followed by England (14%), Australia (9%), Canada (8%) and Spain (7%). Portugal offers only three journal articles and a review (meta-analysis) from the author and supervisors of the present work (Martins, Ramalho, & Morin, 2010). Probably, this distribution reflects a language effect, as most renowned scientific journals are published in English counting with 1.196 journal articles (95%) written in this language. Only 26 (2%) were written in Spanish, 12 (1%) in German and five (0.4%) in French. The two journal articles that were published in Portuguese were from Brazil. This represents an important opportunity for European researchers to invest more in this area of investigation, namely from Portugal. Nevertheless, it is interesting to note that publications on EI come from almost all over the world, reflecting a global phenomenon.
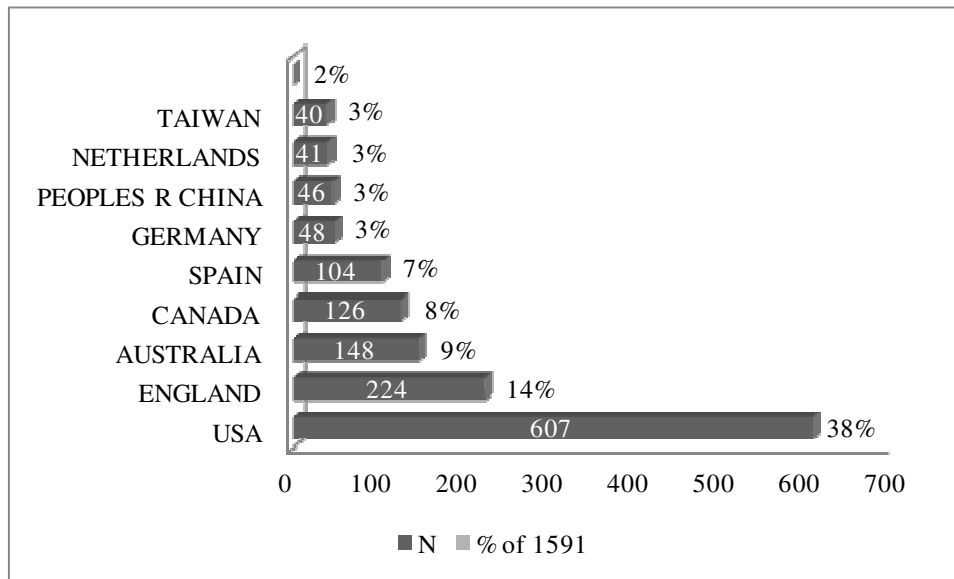
Figure 6. EI Journal Articles by Country

Figure 7 clearly shows that the majority of journal articles on EI were published in *Personality and Individual Differences*, representing 11% of the whole set of scientific publications. But, if we take into consideration only the top 10 journals articles (375), depicted in this figure, the percentage is much higher, representing almost half (48%) of the scientific publications. The remaining journals include less than 5% of the total set of articles. Given that the impact factor of this journal is currently 1.877 (with 2.313 for the 5-year impact factor) and that from the remaining top 10 journals, three of them have even higher impact factors - *Leadership Quarterly* (2.705), *Journal of Organizational Behaviour* (3.854) and *Emotion* (3.875) - we can conclude that it is a rather interesting accomplishment for a new construct. Another good indicator is that there are also publications about EI in very well reputed journals such as the *Academy of Management Review* (5 articles) and the *Academy of Management Learning and Education* (8 articles), with impact factors as high as 6.169 and 4.800 in 2011, respectively.
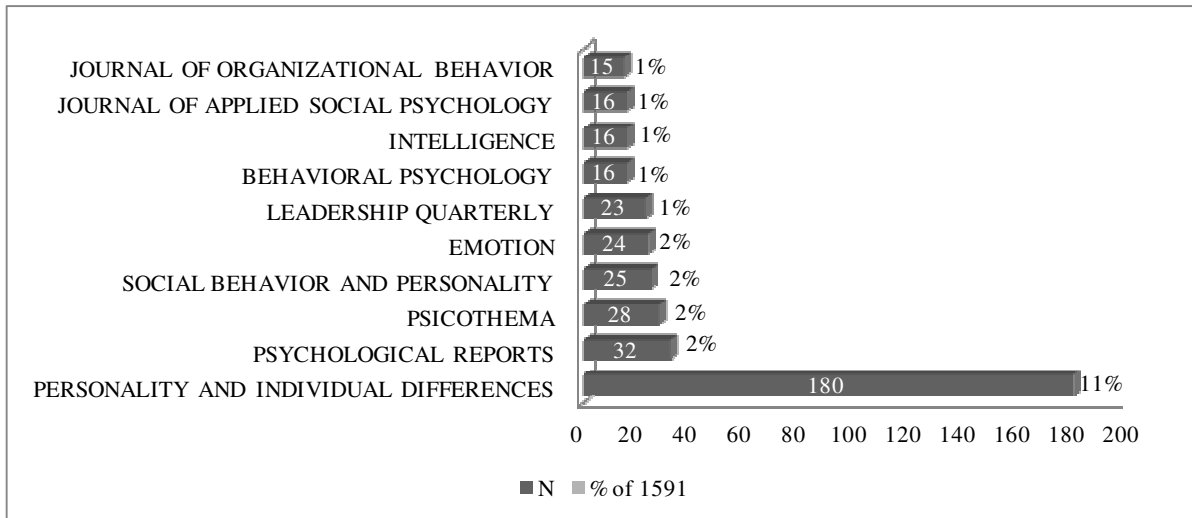
Figure 7. EI Journal Articles by Source

Amongst the authors publishing in this area, there are 10 that appear recurrently in the scientific literature (see figure *Figure 8*). As we will see in the next chapter, most of these authors were the pioneers that launched EI in the academia. The most prominent are Peter Salovey and John Mayer who first presented a framework and measure for this new construct in the 1990s. Afterwards, Nicola Schutte developed one of the first freely available and most frequently used questionnaires of EI, based on Salovey & Mayer's original framework. More recently, Konstantinos Petrides and Adrian Furnham offered a competing conceptualization and operationalization for this construct, with several authors following their approach. The remaining authors have invested more in empirical research, and Richard Roberts is also involved in the development of alternative measures of EI.
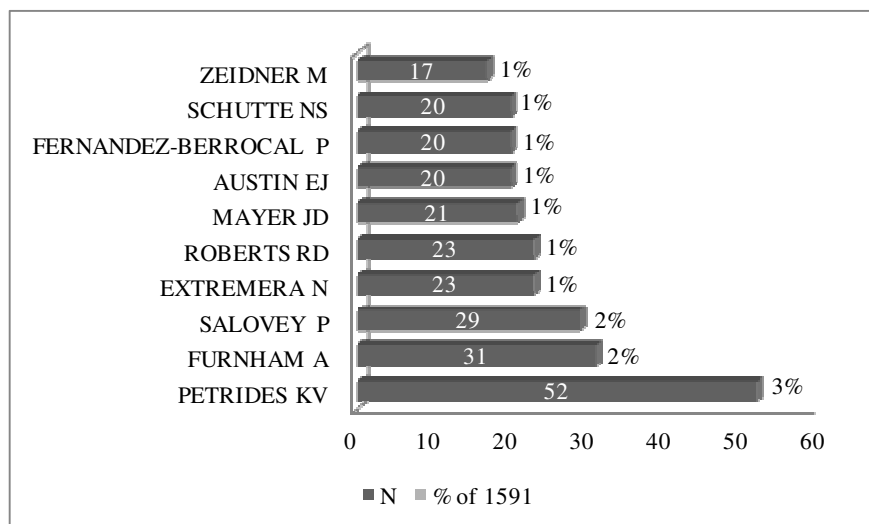
Figure 8. EI Journal Articles by Author

Outside the scientific domain, a simple search in Amazon.com for books with the keyword "Emotional Intelligence" in December 2012 returns more than a thousand results (3,404 results just for the paperback and hardcover editions in English, excluding other formats or possible translations).

Although popular publications largely outpace the scientific ones, we must take into account that serious research requires a long time to produce results and to appear in peer-reviewed journals. Murphy and Sideman (2006) make an important distinction between scientific-driven and practice-driven cultures that may help understand this gap between academic publications and the popular press. While scientists give primacy to the method, the rigorous construct definition and measurement, practitioners emphasize immediate problem-solving and usually do not wait for the results of scientific research to take action. As noted by the authors, the first group wants to "get it right", while the latter wants to "get it moving". Consequently, the rush to action may push practitioners to create their own versions of EI frameworks and measures that are often unclear and far from matching the scientific standards. This probably explains not only the gap between the two kinds of publications, but also much of the scepticism that has surrounded EI. Nevertheless, it is encouraging to witness the significant investment that the scientific community is making on this research topic.

An indicator of the interest in EI is also reflected in meetings of researchers and professionals such as the biannual International Congress of EI, now in its third edition (see http://www.icei2011.org/), having involved 296 authors (14 from Portugal, being one of them an invited keynote speaker) presenting individual communications and posters in English (60 and 39, respectively) and in Spanish (21 and 23, respectively), as well as symposia communications (six in English with 27 presentations and one in Spanish with five presentations). Even outside the specific domain of EI, other more generalist conferences have included papers about this topic. For example in the 2010 Academy of Management Annual Meeting, with the title "Dare to Care: Passion and Compassion in Management Practice and Research", around 20 presentations related to EI were included: nine individual and three symposia with four presentations each (see http://program.aomonline.org/2010/pdf/AOM_2010_Annual_Meeting_Program.pdf). Also, in the 2011 ISSID congress organized by the International Society for the Study of Individual Differences (ISSID) eight individual communications related to EI were presented, as well as a symposium with five papers on the topic and 15 posters.

There are also several internet sites dedicated to EI, such as the Consortium for Research on Emotional Intelligence in Organizations (http://www.eiconsortium.org/). This association currently counts with eight core members, 69 individual members (one of which is the co-supervisor of this thesis), and five organizational members, from North America, Europe, Middle East, Asia and Australia. Membership requires having published several empirical journal articles and/or empirically-based books on the topic of emotional or social intelligence in organizations, as well as being currently involved in research or interventions related to these topics.

Overall, the data presented in this section indicates that EI is an emerging field of research that attracted substantial interest around the world, both from within and outside academia.

Summary and conclusions

This chapter offered a brief overview of how the present work can be contextualized in the research field of emotions, namely in the area of organizational behaviour. We started by reviewing some possible definitions of emotions and then we placed our research in the second level (individual differences) of Ashkanasy and Humphrey's (2011) model of emotions in organizations. Finally, we summarised the current status of this fast growing research topic and concluded that it is of utmost importance to distinguish between rigorous scientific work and popular approaches if we want to "get it right" in the field of EI.

Chapter 2 - State of the Art on Emotional Intelligence Construct

"(...) EI researchers are not only faced with the normally difficult task of conceptually and operationally developing a new construct, but are also saddled with convincing an alarmed and somewhat hostile audience that the endeavour has merit in the first place."

(Spector & Johnson, 2006; p.326)

Since the idea of combining emotions and intelligence in a new construct named EI emerged about 20 years ago, several issues related to its nature, measurement and practical implications were raised. As noted by Brackett, Rivers, and Salovey (2011), some of the key issues include questions such as: Is it an innate mental ability or can it be improved through training and education? Is it a new intelligence or just a relabeling of previous related constructs? How can we measure it in a valid and precise way? How does it manifest in daily life and what are its implications on health and well-being, social interactions, day-to-day decisions and achievement in academic and professional settings? These basic questions will be addressed throughout the next sections, but first it is important to contextualize the emergence of the construct.

2.1 Philosophical and Historical Roots

"The central debate concerns whether intelligence is more important to one's life, whether emotion is, or whether the two can be synthesized in some way."

(Foreword by John Mayer in Barrett & Salovey, 2002, p. xi).

In his foreword of "The wisdom in feeling" (Barrett & Salovey, 2002), John Mayer used the concepts of thesis, antithesis and synthesis to explain the emergence of EI in a very appealing way. As he explains, in Western thinking there was a long historical debate between the Stoic's rationalist thesis that intellect is superior to emotion and the antithesis that values emotions over intellect. In the discipline of Psychology the same discussion took place for a long time, with some scientists arguing that emotions mainly disorganize and disturb reasoning and behaviour, while others suggested that emotions have motivational and adaptive properties. As a result, the importance of emotion has been progressively recognized to include the idea of the intelligent processing of emotions with EI emerging as an attempt to synthesize and balance these contrasting views. Therefore, this link between thinking and

feeling is a relatively new idea that tries to overcome the mind-heart dichotomy. Moreover, neuroscience findings confirm the importance of this association, showing that emotions are essential to rational thinking and to social behaviour (Damásio, 1994).

EI may also be seen as consequence of the will to broaden the conventional notion of intelligence (Brackett et al., 2011; Matthews, Zeidner, & Roberts, 2012a). Taking intelligence in its broader sense as the ability to purposefully adapt to external demands, some authors early recognized that it requires more than abstract reasoning. For example, Thorndike (1920) proposed a tripartite model of intelligence, which consisted of abstract intelligence (the ability to understand and effectively deal with ideas and concepts), mechanical intelligence (the ability to understand and effectively deal with objects), and social intelligence (the ability to analyse people and to act appropriately in social encounters). Social intelligence together with the personal intelligences proposed by Gardner (1983) in his multiple intelligences model were the most influential in the history of EI. Namely, intrapersonal intelligence (the ability to access one's own feelings) and interpersonal intelligence (the ability to monitor others' emotions and mood, which corresponds to social intelligence) are commonly considered the most proximal precursors of EI (Matthews et al., 2012a). As noted by Chamorro-Premuzic and Furnham (2006), the popularity of these novel abilities, often called "hot intelligences" in opposition to the "cold" analytical logical and mathematical abilities, is stimulated by laypeople's aversion to IQ tests.

The enormous receptivity to EI can also be explained by a political and ideological agenda. In 1994, Herrnstein and Murray published "The Bell Curve", a book presenting empirical research on the impact of general intelligence on people's lives. Based on a representative sample of Americans and a large longitudinal data set, with the results of intelligence tests and data about their achievements and living conditions, the authors concluded that intelligence is: (a) one of the most, if not the most important factor in both economic and social success in life; (b) not equally distributed among different ethnicities (African-Americans scored significantly lower than white Americans), and (c) mainly genetically determined (40% to 80%), with little influence of schooling or training programs. Their book became simultaneously a best-seller and a highly controversial issue, with critics accusing the authors of promoting an elitist model of society and racial discrimination (Bechtoldt, 2008). One year later, in 1995, Goleman published his first best-seller, where he explicitly declined the superiority and determinism of general intelligence in favour of EI, suggesting that everyone could be (emotionally) intelligent. This seemed much more fair and in line with an egalitarian society, making EI an appealing concept to the public.

Although the term EI had already appeared in the area of psychology in a German article (Leuner, 1966) and in an unpublished English doctoral dissertation (Payne, 1986), the construct remained largely unnoticed until it was first defined by Salovey and Mayer (1990). It was only after these authors started to systematically research on EI that it became well-known, especially after the publication of the popular books by the journalist Daniel Goleman (Goleman, 1995, 1998). Suddenly, EI becomes a fashionable concept, both inside and, mainly, outside the scientific domain, and is pointed as the solution for every problem, in schools (e.g., achievement), organizations (e.g., leadership) and society in general (e.g., criminality). Although originally conceptualized and measured as a set of abilities that could help individuals solve emotional problems effectively, it was soon embraced by the popular literature and extended to a collection of positive attributes, which were claimed to be far more important than existing empirical evidence could support (Brackett et al., 2011). For example, Goleman (1995) asserted that EI was "as powerful, and at times more powerful, than IQ" in predicting success in life (p. 34). However, when Goleman wrote this, researchers had not yet analysed the correlations between EI and any criterion variable. Such studies only begun in the late 1990's and cumulative research from several independent scientists has now shown that Goleman's early claims do not hold. At the time, Mayer and Salovey were still investigating whether the concept was scientifically valid, and whether the first tests were reliable. Meanwhile, these excessive claims increased scepticism and compromised the serious scientific research, with many critics accusing EI of being simply another fad (e.g., Antonakis, Ashkanasy, & Dasborough, 2009; Landy, 2005; Locke, 2005).

Furnham (2009) sarcastically explains the popularity of Goleman's books based on several best-sellers' fool proof characteristics, such as: simplicity (simple message based on anecdotal evidence), changeability (the idea that human behaviour is changeable), individual focus (the person as the unit of change, instead of the group or the organization), managerial control (the idea that EI can be "empowering"), list of steps and principles (showing how to achieve success), universality (the idea is that the formula works everywhere for all groups and for all time), short-termism (the idea that benefits are immediate), success stories (of those who adopted the ideas presented), self-confirmation (using new terminology to repackage common sense and the things people already know) and unitary perspective (the idea that everyone benefits from having high EI). Nevertheless, Goleman's books had the merit of making an academic appealing concept available to the general public and although the grandiose effects of EI did not find empirical support, it does not mean that it has limited utility (Van Rooy & Viswesvaran, 2007).

Furnham (2006, 2012) also gives an interesting and witty account of the development of management fads, citing EI as an example and suggesting a common natural history with seven distinct stages. First comes the "Academic discovery", i.e., academics make a modest discovery relevant to the workplace, resulting in a scientific paper with its characteristic heavy technical and statistical jargon, usually calling for further research and cautioning against simplistic conclusions. Then the "Description of the study" begins with someone reading the paper and offering an outline of the discovery. Others repeat it and findings are gradually inflated and complexity disregarded. In a third instance, comes the "Popularisation in a best seller", when a business journalist or guru hears about the academic discovery and turns it into a book with an appealing title, which soon becomes a buzzword. Goleman's books are a good example of this stage in the area of EI. Next, because the constructs seem easy to understand and are claimed to be universal, consultants try to apply them everywhere in an effort to look as if they are at the cutting edge of management theory, i.e., the "Consultant hype and universalization" begins. In the case of EI, the easy access to the web and the rapid development of measures made it particularly appealing. Soon, the "Total commitment by the believers" happens, i.e., the "believers or evangelists" move from the consultants to the managers, who widely testify the benefits of EI in conferences, courses and training programs. However, after a few years of intense commercialization, the enthusiasm is reduced and the market is saturated, giving way to "Doubt, scepticism and defection". Managerial doubt follows academic scepticism, followed by journalistic cynicism, and ultimately consultant defection. This may be caused either by poor cost-benefit results or by going back to the original finding and showing that the gap between what was initially verified and what is now done has increased so greatly, that the two are different constructs. Finally, "New discoveries" are made, i.e., the fad ends and the process starts once again with a new magic solution spotted as an opportunity in the market.

That said, the question remains as to where are we now in the area of EI. According to Furnham (2012) academics are starting to respond with cautious and rigorous research to disentangle the construct. Fortunately, academic papers that analyse EI from a scientific angle are escalating, especially in differential psychology. More balanced reviews and meta-analyses are also starting to appear. Somewhere in between the harsh opponents and the unconditional defenders are those researchers who are still working on its definition, assessment, and predictive power. Therefore, moving the debate away from the sensational aspects of EI towards the consideration of more rigorous methodical approaches is essential to its survival as a scientific construct. Maccann, Schulze, Matthews, Zeidner, & Roberts (2008)

made an important distinction between what they called a "popular-science" approach, a "misled science" approach, and a "sound scientific" approach to the study of EI. Clearly, Goleman's account falls in the first type, but it is only a part of the history of EI's research and should not be taken as the whole. As for the other two categories, the debate is still on-going and which approaches are considered as "misled" or "sound" science is not consensual as we will see in the following sections.

2.2 Theoretical Approaches

"All factors are constructs invented by humans that are grouped together in a theory explaining a natural phenomenon".

(Antonakis, 2011, p. 270)

Although many researchers use the term EI as if it was a single construct there are in fact different approaches. Two main classifications have been proposed in order to distinguish them: ability vs. mixed models (Mayer, Salovey, & Caruso, 2000) and ability vs. trait EI (Petrides & Furnham, 2000). While the former distinction is based on whether or not a theoretical model blends cognitive abilities and personality traits, the latter is based on the method used to measure the construct. Pérez, Petrides, and Furnham (2005) emphasize the basic difference between typical versus maximal performance as the basis for distinguishing the two EI constructs. Whereas self-report questionnaires capture trait EI and therefore would not be expected to correlate strongly with measures of cognitive ability, performance tests capture ability EI and, therefore, should relate to such measures. According to Pérez et al. (2005) the distinction between mixed versus ability models is confusing, because it neglects the issue of the measurement method and the fact that self-report measures of EI tend to inter-correlate strongly, irrespective of the model they intend to measure. This may explain why some self-report questionnaires declare to measure ability EI. As pointed by Petrides (2011) it is now generally established that trait EI and ability EI are different constructs, with their respective literatures developing independently and with different operationalizations and implications.

There are currently four main theoretical approaches that will be presented in more detail in the next sections: Mayer and Salovey's (1997) ability model, Bar-On's (1997) emotional-social intelligence model, Goleman's emotional competencies model (1998), and Petrides and Furnham's (2000) trait EI model. While the two first models are clearly included in the ability-trait dichotomy, the other two are more difficult to classify in these two

categories. Although Cherniss (2010) recently suggested to group them under an emotional and social competence label (i.e., ESC models) together with trait EI, as opposed to the ability model, there were negative reactions to that proposal (e.g., Gignac, 2010a; Petrides, 2010). According to Petrides (2010) trait EI is completely antithetical to the other three models and should not be grouped with any of them, especially beneath a competence label. Moreover, in our view, the "ESC-model" designation seems to be as confusing as the "mixed-model" classification, bringing together all "non-ability" models in an indistinct category. Therefore, we decided to present the four models separately.

2.2.1 Ability EI

Salovey and Mayer (1990) first defined EI as a type of social and personal intelligence involving "the ability to monitor one's own and others' feelings and emotions, to discriminate among them and to use this information to guide one's thinking and actions" (p. 189). According to their original thinking, EI lays at the intersection between the mental processing of emotional information and its integration with cognitive information, including the ability to: (1) appraise and express emotions in self and others; (2) regulate emotion in self and others; and (3) use emotions in adaptive ways. This pioneering model of EI is represented in *Figure 9* (adapted from Salovey & Mayer, 1990).
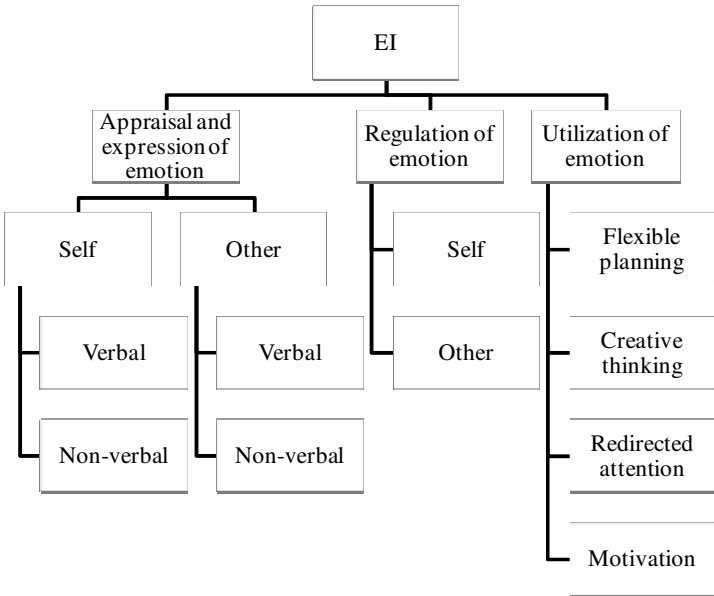
Figure 9. Original Three-Branch Model of EI

Later, Mayer and Salovey (1997) refined their definition of EI and moved from a three-branch to a four-branch hierarchical model, where more basic psychological processes are at the base and more advanced psychological processes are at the top. They redefined EI as "the capacity to reason about emotions, and of emotions to enhance thinking", involving the abilities to: (1) accurately perceive, appraise and express emotions, (2) access and generate emotions to facilitate thinking, (3) understand emotions and emotional knowledge, and (4) reflectively regulate emotions in ways that promote emotional and intellectual growth (Mayer & Salovey, 1997, p.5). The first two abilities are considered more experiential and the last two more strategic. These four branches are displayed in *Figure 10* (adapted from Mayer & Salovey, 1997).
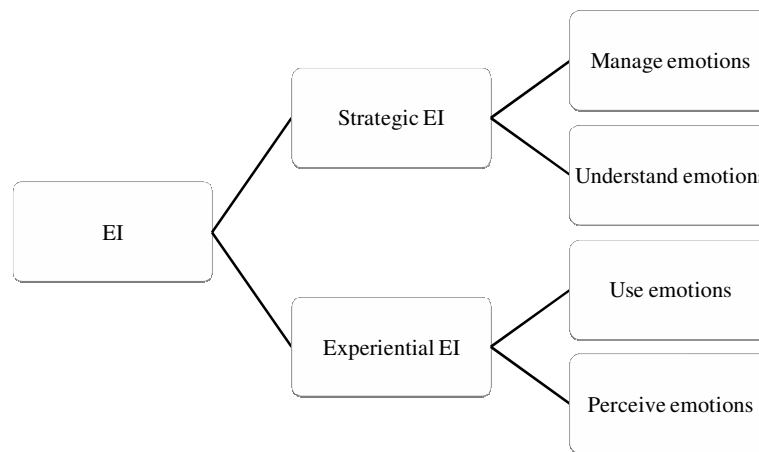
Figure 10. Four-Branch Ability Model of EI

The first branch – perceiving emotions - includes abilities such as accurately identifying emotions in oneself and others, adequately expressing emotions and distinguishing honest from phony emotional expressions. The second branch, includes using emotions to direct attention to relevant information, gathering the appropriate emotions to facilitate cognitive activities like reasoning, problem solving, and decision-making using mood swings to take different viewpoints, and using an adequate emotional state to accomplish a specific task (e.g., using a happy mood to facilitate creativity). The third branch - understanding emotions – includes correctly labelling emotions, knowing their meanings, understanding their complex relationships, their different combinations and how they progress (e.g., know that sadness may lead to despair which may lead to devastation). Finally, managing emotions means being open to pleasant and unpleasant feelings, choosing when to engage or not on an emotion depending on its value, monitoring and managing emotions in oneself and others (e.g.,

preserving a good mood; calming down after feeling angry; motivating and supporting a co-worker before an important oral presentation).

In this framework, EI is considered as a type of intelligence and, therefore, it should be objectively measured, with right and wrong answers, and be distinct from personality. In fact, the authors presented evidence that ability EI meets the necessary standards to be considered a real type of intelligence: (1) that the set of abilities are capable of being operationalized; (2) that these abilities are inter-correlated and relate to pre-existing intelligences, while at the same time exhibiting unique variance; and (3) that the intelligence shows developmental effects with age.

2.2.2 Bar-On's ESI Model

Bar-On (2006) places EI in the context of well-being defining it as a set of "interrelated emotional and social competencies, skills and facilitators that determine how effectively we understand and express ourselves, understand others and relate with them, and cope with daily demands (p. 14)." In line with this conceptualization, the author prefers the term "emotional-social intelligence" (ESI), although initially he used the term emotional quotient (EQ) as an analogy to intelligence quotient (IQ). He proposes a broad multifactor model with not only the core emotion-processing abilities traditionally associated with EI, but also motivational variables associated with effective functioning. The ESI model is one of the more widely known models and includes 15 conceptual components grouped into five theoretical clusters outlined in Table 1: intrapersonal, interpersonal, stress management, adaptability, and general mood.

The intrapersonal component refers mainly to emotional self-awareness and self-expression. It includes five different abilities and dispositions with two of them more closely related to what is generally considered part of EI and the other three representing conative factors and dispositions. Specifically, assertiveness could be roughly equated with the expression of emotions aspect of other models of EI and emotional self-awareness with the appraisal of emotions in self (Wood, Parker, & Keefer, 2009). According to Wood, Parker, and Keefer (2009), the inclusion of self-regard, independence, and self-actualisation offers a valuable insight of the individual, although they were not originally considered part of EI.

The interpersonal component refers mostly to social awareness and interpersonal relationship, which is consistent with other models of EI. However, it also includes a social responsibility factor, which is not usually considered as a component of EI. The third component, adaptability, refers to how people deal with change, and according to Wood et al.

(2009), it is conceptually analogous to Salovey and Mayer's (1990) emotion utilisation, i.e., the effective use of emotions to facilitate thinking and reasoning. The fourth component, stress management is related to emotional management and regulation in stressful situations. It includes impulse control and stress tolerance, which according to Wood et al. (2009) are conceptually similar to the Salovey and Mayer's (1990) regulation emotion aspects. Finally, the general mood component is related to self-motivation and although not originally considered a part of EI, it is included in this model for its important contribution for coping and well-being (Wood et al., 2009).

Table 1. *Bar-On's ESI Model*

Clusters	Competencies	Brief description
Intrapersonal	Self-Regard	Accurately perceiving, understanding and accepting oneself
	Emotional Self-Awareness	Being aware of and understanding one's emotions
	Assertiveness	Effectively and constructively expressing one's emotions and oneself
	Independence	Self-reliance and freedom of emotional dependency on others
	Self-Actualization	Striving to achieve personal goals and actualize one's potential
Interpersonal	Empathy	Being aware of and understanding how others feel
	Social Responsibility	Identifying with one's social group and cooperating with others
	Interpersonal Relationship	Establishing mutually satisfying relationships and relating well with others
Stress Management	Stress Tolerance	Effectively and constructively managing emotions
	Impulse Control	Effectively and constructively controlling emotions
Adaptability	Reality-Testing	Objectively validating one's feelings and thinking with external reality
	Flexibility	Adapting and adjusting one's feelings and thinking to new situations
	Problem-Solving	Effectively solving problems of a personal and interpersonal nature
General Mood	Optimism	Being positive and looking at the brighter side of life
	Happiness	Content with oneself, others and life in general

Note. Adapted from Bar-On (2006)

Overall, as noted by Mayer, Salovey, and Caruso (2008) this model encompasses several components related to EI (e.g., emotional self-awareness and empathy), but adds other characteristics that are beyond this construct's original conception (e.g., reality testing, assertiveness, self-regard, and self-actualization). According to the authors, it was this mix of related and unrelated attributes that led them to call this model a mixed model of EI.

In 2011, Bar-On decided to review his model and presented some rearrangements both at the cluster and competencies level, shown in Table 2. The intrapersonal cluster was split into self-perception and self-expression. Self-perception includes self-regard, self-actualization and emotional self-awareness, while self-expression includes assertiveness, independence and emotional expression, a new competence. Adaptability was relabelled decision making and includes impulse control instead of flexibility, which is now part of the stress management cluster. The general mood cluster was removed and its competencies were reallocated: optimism is now part of the stress management cluster and happiness is considered a global well-being indicator.

Table 2. *Bar-On's Reviewed Model*

Original model		Reviewed model	
Clusters	Competencies	Clusters	Competencies
Intrapersonal	Self-Regard	Self-Regard	Self-Perception
	Self-Actualization	Self-Actualization	
	Emotional Self-Awareness	Emotional Self-Awareness	
	Assertiveness	Emotional Expression	Self-Expression
	Independence	Assertiveness	
		Independence	
Interpersonal	Empathy	Empathy	Interpersonal
	Social Responsibility	Social Responsibility	
	Interpersonal Relationship	Interpersonal Relationship	
Adaptability	Problem-Solving	Problem-Solving	Decision Making
	Reality-Testing	Reality-Testing	
	Flexibility	Impulse Control	
Stress Management	Impulse Control	Flexibility	Stress Management
	Stress Tolerance	Stress Tolerance	
		Optimism	

Note. Adapted from www.mhs.com

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2.2.3 Goleman's Competencies Model

In general terms, Goleman (2001a) defines EI as "the abilities to recognize and regulate emotions in ourselves and in others" (p. 14). His model is based on emotional and social competencies relevant for the workplace and it was proposed as a *theory of performance* to predict excellence in jobs of all kinds. The first version (1995, 1998) included 25 competencies organized in five dimensions: (1) *Self-Awareness* (knowing one's emotions), (2) *Self-Regulation* (managing emotions), (3) *Motivation* (motivating oneself), (4) *Empathy* (recognizing emotions in others), and (5) *Social Skills* (handling relationships). In 2001 the model was reduced to four dimensions and 20 competencies. Currently, the model includes 18 competencies organized in four clusters, as depicted in Table 3: (1) *Self-Awareness* (knowing one's internal states, preferences, resources, and intuitions) includes three competencies, (2) *Self-Management* (managing ones' internal states, impulses, and resources) includes six competencies, (3) *Social Awareness* (how people handle relationships and awareness of others' feelings, needs, and concerns) includes three competencies, and (4) *Relationship Management* (concerns the skill or adeptness at inducing desirable responses in others) includes six competencies.

Overall, as noted by Mayer, Salovey, and Caruso (2008) this model, like Bar-On's includes several components related to EI (e.g., emotional self-awareness and empathy), but also introduces many other qualities that lay outside this construct's original idea (e.g., trustworthiness, adaptability, innovation, communication, and team capabilities). Therefore, they classified this model as a mixed model of EI, as well.

Table 3. *Goleman's EI Model*

Clusters	Competencies	Brief description
Self-Awareness	Emotional Awareness	Recognizing one's emotions and their effects
	Accurate Self-Assessment	Knowing one's strengths and limits
	Self-Confidence	A strong sense of one's self-worth and capabilities
Self-Management	Emotional Self-Control	Keeping disruptive emotions and impulses in check
	Transparency	Maintaining integrity, acting congruently with one's values
	Adaptability	Flexibility in handling change
	Achievement	Striving to improve or meeting a standard of excellence
	Initiative	Readiness to act on opportunities
	Optimism	Persistence in pursuing goals despite obstacles and setbacks
Social Awareness	Empathy	Sensing others' feelings and perspectives, and taking an active interest in their concerns
	Organizational Awareness	Reading a group's emotional currents and power relationships
	Service Orientation	Anticipating, recognizing, and meeting customers' needs
Relationship Management	Developing Others	Sensing others' development needs and bolstering their abilities
	Inspirational Leadership	Inspiring and guiding individuals and groups
	Change Catalyst	Initiating or managing change
	Influence	Wielding effective tactics for persuasion
	Conflict Management	Negotiating and resolving disagreements
	Teamwork & Collaboration	Working with others toward shared goals. Creating group synergy in pursuing collective goals

Note. Adapted from (Wolff, 2005)

2.2.4 Trait EI

The most recent model to come forward in the field is typically known as trait EI, although sometimes called trait emotional self-efficacy. Petrides, Pita, and Kokkinaki (2007) conceptualize EI as a lower-order personality construct, and therefore, as being inevitably associated with higher-order personality dimensions. Simply put, trait EI refers to emotion-related personality traits. It emerged as a "second generation model" that builds on already established models of EI (Cherniss, 2010). Its sampling domain was derived from a content analysis of the early models of EI, presented in the previous sections (i.e., Mayer & Salovey's, Bar-On's, and Goleman's models) as well as other related constructs (e.g., alexithymia, affective communication, emotional expression, and empathy). The final proposal includes only the elements that were common to more than a single model, excluding minor elements that appeared in only one specific conceptualization. The resulting structure contains 15 facets, organized in four major factors presented in Table 4.

Table 4. *Trait EI Model*

Factors	Facets	Brief description
Well-Being	Self-esteem	Successful and self-confident.
	Trait Happiness	Cheerful and satisfied with life.
	Trait Optimism	Confident and likely to "look on the bright side" of life.
Self-Control	Emotion regulation	Capable of controlling emotions.
	Stress management	Capable of withstanding pressure and regulating stress.
	Impulsiveness (low)	Reflective and less likely to give in to urges.
Emotionality	Emotion perception (self and others)	Clear about own and other people's feelings.
	Emotion expression	Capable of communicating feelings to others.
	Relationship skills	Capable of having fulfilling personal relationships.
	Trait Empathy	Capable of taking someone else's perspective.
Sociability	Social competence	Accomplished networkers with excellent social skills.
	Emotion management (others)	Capable of influencing other people's feelings.
	Assertiveness	Forthright, frank, and willing to stand up for their rights.
Other	Adaptability	Flexible and willing to adapt to new conditions.
	Self-motivation	Driven and unlikely to give up in the face of adversity.

Note. Adapted from Mikolajczak, Luminet, Leroy, and Roy (2007) and Petrides (2011)

Trait EI theory sustains that there is no ideal profile of the "emotionally intelligent" person, who will stand out in all life domains and that all people should strive to achieve. Certain profiles will be advantageous in some situations, but not in others and the simplistic idea that "EQ is good for you" is a myth (Petrides, 2011; p.661). For example, research has shown that high EI individuals experience greater mood deterioration after watching a distressing video (Petrides & Furnham, 2003) or after recalling a poor decision (Sevdalis, Petrides, & Harvey, 2007). Therefore, high trait EI is not necessarily adaptive and low EI is not necessarily maladaptive, rather it depends on the context and on the kind of behaviour one is trying to predict.

The idea that EI facets are personality traits instead of competencies or mental abilities has received support from genetic studies demonstrating that the same genes that are responsible for individual differences in the Big Five are also related with individual differences in trait EI (Vernon, Villani, Schermer, & Petrides, 2008). According to Petrides (2011), the estimated heritable proportion of global trait EI is approximately 40%, closely resembling the broader personality factors.

2.3 Measurement Approaches

> *"(…) what matters most is how the trait is operationalized and what it predicts and not what the trait is called".*
>
> (Antonakis, 2011)

In this section we will present the most important measures of EI validated in the scientific literature and specifically developed to assess this construct, whether as an ability or as a trait. Also, we will only include those that appeared after the construct was first theorized by Salovey and Mayer (1990), since only then was created the conceptual foundation for the subsequent development of EI's measurement. Finally, we will only incorporate instruments that aim to operationalize the scientific models presented in the previous section.

It is important to note is that although these different kinds of measures may predict outcome variables quite differently, they should not be considered mutually exclusive, but rather as complementary. As pointed by Parker, Keefer, and Wood (2011) future research should include multiple measurement formats (self-report vs. performance) and different levels of information processing (explicit vs. implicit). For instance, individuals may have the declarative emotion knowledge necessary to perform well on a performance test, but not have

the necessary motivation or experience to use it in real-life situations. Alternatively, others may use highly adaptative emotional behaviours without being aware of them and able to express them on a self-report. A good illustration of this kind of research is the recent study by Qualter, Gardner, Pope, Hutchinson, and Whiteley (in press) showing the different contributions of both ability and trait EI on academic performance for British adolescents: while ability EI moderated the effect of cognitive ability on performance, trait EI had a direct effect on performance (only for boys). This suggests that using both kinds of measures to asses EI allows us to see the "bigger picture" and to uncover the different processes linking this construct with its outcomes.

2.3.1 Performance or Ability Measures

In this kind of measure the individual is asked to solve emotional problems and the accurateness of his/her reasoning is assessed. In an effort to meet the criteria for a traditional measure of intelligence, these instruments are based on an "objective" style of response with right or wrong answers, determined by consensus judgments or expert judgments. Therefore, it aims to appraise the actual capacity to perform well in emotion related tasks, instead of one's beliefs about those capacities.

MEIS. The Multifactor Emotional Intelligence Scale (MEIS) was the first ability measure of EI developed by Mayer, Caruso and Salovey (2000) to assess their four-branch model. This instrument includes 402 items organized in 12 sub-scales with tasks that measure respondents' ability to: (1) perceive emotions in faces, music, designs and stories; (2) use emotions, by associating them with physical sensations and assimilating them with their judgments; (3) understand complex emotions and how they progress, their transitions and relativity; and (4) manage emotions in themselves and others, by evaluating the effectiveness of given responses to specific situations (see Table 5). With this test Mayer, Caruso and Salovey (2000) demonstrated that EI meets the conceptual, correlational, and developmental criteria for a traditional type of intelligence.

Table 5. *MEIS Overview*

Branch	Tasks	Stimuli	Items
Perceiving emotion	Faces	8	48
	Music	8	48
	Designs	8	48
	Stories	6	42
Using emotions	Synesthesia	6	60
	Feeling biases	4	28
Understanding emotions	Blends	8	8
	Progressions	8	8
	Transitions	4	24
	Relativity	4	40
Managing emotions	Managing feelings of others	6	24
	Managing feelings of the self	6	24

Note. Adapted from Mayer, Caruso and Salovey (2000)

MSCEIT. The most renowned performance measure of EI is the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT), which evolved from its predecessor, the MEIS. The MSCEIT is now in its Version 2.0 and was developed by (Mayer, Salovey, & Caruso, 2002) to operationalize their four-branch ability model of EI. Therefore, it assesses how well people solve emotion related problems dealing with the perception, use, understanding, and management of emotions. The test contains 141 items that are divided among eight tasks (two for each of the four branches), as shown in Table 6. Perceiving emotions includes indicating the degree to which a specific emotion is present in photographs of people's faces (Faces), as well as in abstract designs and landscapes (Pictures). Using emotions involves evoking emotions and matching physical sensations to them (Sensations), as well as judging the moods that might assist or hinder the performance of specific cognitive tasks and behaviours (Facilitation). Understanding emotions entails analysing combined or complex emotions (Blends) and identifying how emotional reactions evolve over time (Changes). Finally, Managing emotions includes jugging which actions are most effective in generating a desired emotional outcome in an individual (Emotion Management) and in the management of others' feelings (Social Management).

Table 6. *MSCEIT Overview*

Branch	Tasks	Items
Perceiving emotion	Faces	20
	Pictures	30
Using emotions	Sensations	15
	Facilitation	15
Understanding emotions	Blends	12
	Changes	20
Managing emotions	Management	20
	Relationships	9

Note. Adapted from Mayer, Salovey, Caruso, and Sitarenios (2003)

In this kind of test, the correct answer is based on the percentage of respondents who endorse a particular option, rather than on an absolute or definitive result (Van Rooy, Viswesvaran, & Pluta, 2005). The MSCEIT is scored with both *consensus* and *expert* scoring methods, which were reported has highly correlated by the authors (from .96 to .98; Mayer, Salovey, Caruso, & Sitarenios, 2003). The consensus scoring compares each participant's answer with the preferred response of the normative sample and is considered "correct" if there is a match. The expert scoring method involves comparing a participant's response with the answers considered correct by emotion experts.

Regarding reliability, the authors report total scale split halves of .91 and .93 (Mayer et al., 2003), as well as test-retest reliability of .86 (Brackett & Mayer, 2003).

As for construct validity, a meta-analysis by Van Rooy et al. (2005) has shown that compared to the self-reports of EI, the MSCEIT demonstrated a higher correlation with cognitive ability (r = .34) and a lower one with personality (*r* = .11). Overall, these results support its convergent and discriminant validity as an ability measure. Emotional Understanding scores have shown the strongest association with verbal measures, from .51 to .56 (Brackett & Mayer, 2003; O'Connor & Little, 2003).

The authors have also created the Youth Version (MSCEIT-YV) for ages between 10 and 17 years, comprising 97 items that tap the same four branches as the adult version, but only with one task for each one and scoring based only in expert consensus. Based on a sample of 756 American students results revealed adequate reliabilities, with Cronbach's alphas ranging from .70 to .79 and split-half coefficient of .81 for the total scale (Rivers et al., 2012).

Main critiques. There is now considerable research showing various weaknesses and limitations of ability-based maximum performance measures of EI such as the MSCEIT, including: (a) the lack of structural fidelity and low sub-scale reliability coefficients (Fan, Jackson, Yang, Tang, & Zhang, 2010; Keele & Bell, 2008); (b) items measuring mainly abstract semantic knowledge about emotions, rather than intelligence (Brody, 2004); (c) its scoring procedures (MacCann, Roberts, Matthews, & Zeidner, 2004); and (d) lack of validity in predicting affective criteria, such as subjective well-being (Zeidner & Olnick-Shemesh, 2010). One important limitation of this kind of measure is that it fails to capture the intrapersonal component of the EI construct, since the emotions experienced by the test-taker are accessible only to the individual (Petrides, Furnham, & Mavroveli, 2007; Van Rooy & Viswesvaran, 2007).

Several studies have questioned the factor structure of the MSCEIT and showed that it does not measure the intended four factors (e.g., Palmer, Gignac, Manocha, & Stough, 2005; Rode et al., 2008; Rossen, Kranzler, & Algina, 2008). In an effort to synthesize the diverse findings regarding the factor structure of the MSCEIT, (Fan et al., 2010) conducted a meta-analytic study and found that although the four-factor model had excellent fits, it was not suitable due to the high correlation between perceiving and using emotions branches (r = .90, p < .01) suggesting they tap the same underlying construct. Based on this, they propose a three-factor solution as the best-fitting alternative model. As wisely noted by the authors, while this finding does not support that the tasks on the Perceiving and Facilitating factors measure distinct constructs, it does not automatically invalidate the differentiation between them. More recently, Gardner and Qualter (2011) also found support for a three-factor solution reflecting the Experiential Emotional Intelligence area (perceiving and using emotions), Understanding Emotions and Managing Emotions branches.

Furthermore, Joseph and Newman (2010a) tested a progressive (cascading) pattern among ability-based EI facets, in which emotion perception causally preceded emotion understanding, which in turn preceded emotion regulation in the prediction of job performance. To our knowledge, this is the only empirical demonstration of the hierarchical organization of this model, but the authors did not include one of the branches (using emotions), because they considered it conceptually redundant with emotion regulation and also because it lacks empirical support. Therefore, this factor seems to be a particularly fragile point of this measure.

Mcenrue & Groves (2006) question the content and face validity of the MSCEIT based on an analysis of the items. For instance, they claim that the test does not seem to measure

some abilities included in the model, such as the ability to identify one's own emotions; express emotions accurately; distinguish accurate from inaccurate or honest from dishonest expressions of feelings; manage one's own emotions; redirect and prioritize thinking based on feelings; or encourage different problem-solving approaches. Furthermore, they caution that certain items may not have face value in work settings. For example, identifying emotions elicited by abstract pictures or associating sensations (e.g., cold, blue, sweet) with emotions (e.g., surprise) does not seem relevant for workers or managers. Therefore, these content and face validity concerns suggest that using the MSCEIT for purposes of development in organizational settings may create some practical difficulties.

Regarding scoring issues, in this kind of measure is controversial, since the subjectivity of emotional experience makes it difficult to build questions with truly objective criteria. First, the use of consensus norms and experts' norms to identify the "correct" response means taking for granted that what people commonly agree is correct and that emotion specialists know the answer, which is not necessarily true. Furthermore, as pointed by Fiori and Antonakis (2011), the almost perfect correlation between both kinds of norms reported for the MSCEIT is more a problem than an advantage. If experts respond to MSCEIT items just as any other person, then the question remains as to the existence of real emotion experts. Secondly, both methods have the potential limitation of being influenced by culture. Indeed, recent studies indicate cultural biases in favour of individualist cultures. For example, Chinese respondents obtained lower results in all the MSCEIT dimensions compared to the Americans (Law, Wong, Huang, & Li, 2008), as well as the Pakistanis compared to the French (Karim & Weisz, 2010). Finally, the consensus approach stresses conformity and, therefore it is possible that a person high on EI is penalized for not sticking to the general pattern (Van Rooy & Viswesvaran, 2007). Indeed, a study by Rode et al. (2008) found a higher correlation between the overall MSCEIT score and impression management (.35) than with general mental ability (.24), suggesting that this measure may be more related to social desirability than to intelligence. Moreover, respondents obtain big increases in scores when answering easy questions correctly, but only small ones when answering difficult questions correctly. Consequently, the scoring method may not differentiate adequately between higher levels of EI (Føllesdal & Hagtvet, 2009).

Curiously, Austin (2010) found that the MSCEIT perceiving branch did not correlate with respondents performance in objective emotion perception tests. As noted by the author, this finding (which is in line with previous studies) suggests that the perceiving branch tasks are not measuring emotion perception as commonly understood. This lack of convergent

validity is probably due to the fact that the MSCEIT perceiving items are different in format, requiring an estimate of the extent to which an emotion is present in a picture, instead of requiring the identification of a specific emotion. Moreover, this study also found that only the understanding branch was significantly correlated with intelligence, indicating that the other MSCEIT branches probably are not measuring a form of intelligence. However, a very recent study by Fiori and Antonakis (2012) found that managing emotions was the only branch that did not correlate with fluid intelligence (accounting for attenuating effects of measurement errors). Nevertheless, none of the four branches of the MSCEIT predicted performance in a task that required selective attention to emotional stimuli, in contrast with fluid intelligence and Openness. As an explanation, the authors propose that the MSCEIT may be tapping only conscious processing, while the selective attention task requires nonconscious processing. Alternatively, the authors suggest that the MSCEIT measures performance in hypothetical situations, not actual performance and emotion knowledge does not guarantee its use in real life situations. Finally, the authors propose that the MSCEIT may not actually measure EI and predict emotionally intelligent behaviours.

AEIM. The systematic criticisms and unhelpful findings on the MSCEIT encouraged the development of alternative measures of ability EI (Petrides, 2011). An example is the Ability Emotional Intelligence Measure (AEIM) developed by Warwick, Nettelbeck, and Ward (2010). To address the lack of convergent validity of the MSCEIT's perception of emotion, the AEIM items for this branch were derived from the FACS (Facial Action Coding System) database of facial expressions. Emotion management items ask participants which strategy is the most effective in terms of increasing, decreasing or maintaining a specific emotion, instead of just asking which would make the person feel better, in general terms. To address the consensus issue, which assesses mostly emotional knowledge, the new instrument also uses a confidence score (i.e., how confident a person feels about their decisions), which allegedly assesses individuals' decision-making skills. Questions for using and understanding emotions branches are similar to the MSCEIT.

The perception subscale includes two male and two female faces representing four basic emotions with 20-item consensus score and 4-item confidence score. The utilization subscale comprises 18-item consensus score and 6-item confidence score asking participants to indicate the usefulness of specific emotions in given tasks. The understanding branch comprises two subscales with 10-item consensus score and 2-item confidence score each: Transitions (i.e., how emotions change over time) and Blends (i.e., emotion combinations). The regulation branch comprises also two subscales with 12-item consensus score and 4-item

confidence score each, asking participants to indicate how effective three possible actions would be to increase, decrease or maintain a particular emotion in self (regulation of emotions in self) and others (regulation of emotions in others).

Although Warwick et al. (2010) claimed that their preliminary study supported the validity and reliability of the AEIM, based on an exploratory factor analysis and hierarchical regressions, an independent reanalysis of their results did not confirm the authors' conclusions (Antonakis & Dietz, 2011). Therefore, this measure needs further investigation before it is considered a valid alternative to the MSCEIT. Furthermore, the fact that it is also a proprietary measure with very similar characteristics to the original instrument probably does not make it a very appealing option.

STEU and STEM. Some recent attempts have been made to design alternative ability measures of EI using a different paradigm, the Situation Judgment Tests (SJTs). MacCann and Roberts, (2008) developed the Situational Test of Emotional Understanding (STEU) and the Situational Test of Emotion Management (STEM) to measure two branches of the ability EI model. In these tests individuals are confronted with emotional complex scenarios based on critical incidents and have to choose the best alternative response.

The STEU includes 42 multiple-choice items that present emotional situations (either decontextualized or based on a personal or work related example). For each item, participants have to choose what emotion the described situation will most likely elicit, based on their knowledge. The correct responses are based on theories of emotion, instead of expert scoring. A sample item is: "Xavier completes a difficult task on time and under budget. Xavier is most likely to feel? (a) Surprise; (b) Pride; (c) Relief; (d) Hope; (e) Joy". The authors also developed a short-form of this test with the best 25 items (Maccann & Roberts, 2010). Cronbach alpha for this version was .81 in the original Australian student sample (compared to .72 for the full-form) and .68 in a second sample (compared to .66 for the complete version).

The STEM comprises 44 multiple-choice or rate-the-extent items presenting scenarios extracted from real personal and work contexts, based on semi-structured interviews. Respondents are asked to choose the most effective actions (or rate their effectiveness) to manage (amplify, maintain, or suppress) the emotions (fear, anger or sadness) in the specified situations and their options are compared with experts' (psychologists, life coaches, and counsellors) choices. MacCann and Roberts (2008) found that both response formats show different patterns of correlations: multiple-choice correlate higher with vocabulary and lower with personality, and rate-the-extent correlates higher with personality and lower with

vocabulary. Therefore, they are both available to disentangle method effect from real construct relationships. A sample item is: "Clayton has been overseas for a long time and returns to visit his family. So much has changed that Clayton feels left out. What action would be the most effective for Clayton? (1) Nothing, it will sort itself out soon enough; (2) Tell his family he feels left out; (3) Spend time listening and getting involved again; (4) Reflect that relationships can change over time". The authors also developed a short-form of this test with the best 20 items (Maccann & Roberts, 2010). Cronbach alpha for this version was .75 in the original sample (compared to .68 for the full-form) and .83 in a second sample (compared to .87 for the complete version).

One major advantage of these tests is that they are freely available together with the scoring keys, in contrast to the MSCEIT. On the other hand, they only assess two EI components and rely on written accounts, missing the richness of actual emotional situations. To overcome this limitation, the authors and their current group of collaborators are already working on a video-based approach to these tests, showing real social exchanges (Matthews et al., 2012a). Another concern is the low internal reliability of the STEU in two studies: the reported value was .43 in MacCann and Roberts' (2008) study 2 with a non-student sample and .48 in an independent study with an English student sample (Austin, 2010). Moreover, although both STEM and STEU were positively correlated with the MSCEIT, Austin (2010) reported that only the STEU was significantly correlated with intelligence, and could therefore be considered a cognitive ability.

Finally, Austin (2010) makes two interesting points regarding ability measures in general, that should be addressed in future research. First, these instruments do not differentiate among specific emotions or between negative and positive emotions, although research has shown that there are significant intra-individual differences in this regard. Therefore, she suggests creating tests that allow the separate study of these different kinds of emotional processing. Secondly, the current ability measures rely only on explicit conscious knowledge of emotions in item responding. Therefore, she suggests creating tests that also assess quick (implicit) processing of emotional information. This is in line with the dual-process model proposed by Fiori (2009), who called the attention for the need to incorporate findings regarding automatic emotional experience with research on EI, which has overlooked the psychological processes underlying individual differences in this area. In her view, automatic processing would account for spontaneous emotionally intelligent actions, whereas conscious processing would explain deliberate ones.

2.3.2 Self-Report or Trait Measures

In contrast to ability EI, a considerable number of self-report measures of EI exist, but some of them do not have a clear theoretical framework or a strong empirical foundation. Moreover, many of them purport to measure ability EI (Pérez et al., 2005). Nevertheless, they are intrinsically meaningful and compatible with the subjective nature of emotional experience. Also, although self-perceptions may be not particularly accurate or even consciously available, they markedly influence our behaviour, regardless of whether they are truthful or not (Mavroveli & Sánchez-Ruiz, 2011; Petrides, 2010). In an effort to reduce the subjectivity of self-reports some authors have attempted to assess EI in a 360º perspective or multi-rater format, by adding an informant version and, sometimes, interviews.

SEIS. The SEIS - Schutte Emotional Intelligence Scale - is one of the most popular and recurrently used questionnaires in research on EI. Developed by Schutte et al. (1998), this measure has appeared in the literature under different designations, such as: Schutte Self-Report Emotional Intelligence (SSREI) Scale, Emotional Intelligence Scale (EIS), Schutte Self-Report Inventory (SSRI) and Assessing Emotions Scale (AES). This proliferation of labels is probably due to the fact that the authors did not provide a name, in the original publication of the questionnaire (Kun, Balazs, Kapitany, Urban, & Demetrovics, 2010). Although, they used the designation "Assessing Emotions Scale" in later publications (e.g., Schutte, Malouff, Thorsteinsson, Bhullar, & Rooke, 2007), we adopted the label "Schutte Emotional Intelligence Scale" as it explicitly includes the term EI and identifies the main author of the instrument, making it more distinctive.

The SEIS is a 33-item questionnaire based on Salovey and Mayer's (1990) original three-factor model of EI and assesses the extent to which respondents believe they accurately appraise and express emotions, regulate emotions, and use them to solve problems. However, Schutte et al. (1998) identified all items as representing one global EI factor, based on exploratory factor analysis.

The measure has displayed good psychometric properties: internal consistency across several samples, showed a mean Cronbach's alpha of .87, two-week test-retest reliability reported in the original study was .78 and the measure has evidence of concurrent, predictive and discriminant validity (Schutte, Malouff, & Bhullar, 2009).

However, its factor structure is still an unresolved issue, with several studies suggesting multi-factorial solutions instead of a single-factor. Moreover, there seems to be little agreement regarding the number of factors that are assessed by this instrument. Petrides and Furnham (2000), Ciarrochi, Deane and Anderson (2002), Saklofske, Austin, and Minski

(2003), and Keele and Bell (2008) identified four factors based on exploratory and confirmatory factor analysis: optimism/mood regulation, appraisal of emotions, social skills, and utilization of emotions. Austin, Saklofske, Huang, and McKenney (2004) found three factors as a result of exploratory factor analysis: optimism/positivity, regulating/using emotions, and appraisal of emotions.

Gignac, Palmer, Manocha, and Stough (2005) concluded that neither the one-factor nor the 4-factor solution are the most suited and tested an alternative 6-factor structure to represent the original model: appraisal of emotions in the self, appraisal of emotions in others, emotional expression, emotional regulation of the self, emotional regulation of others, and utilization of emotions for problem solving. After removing 5 items based on a content validity analysis, confirmatory factor analysis was unable to find two of the six dimensions: emotional regulation of others and emotional expression. Therefore, the 6-factor model could not be completely recovered. Nevertheless, we believe that this study has the merit of retrieving the important distinction between self and other provided by the original model of Salovey and Mayer (1990), which other authors seem to have overlooked.

More recently, Ng, Wang, Kim, and Bodenhorn (2010) also tested six different models with an international sample and results only confirmed the 4-factor structure obtained by Gignac et al. (2005) and their own version (without an acquiescence factor). Although both studies support the distinction between appraisal of emotions in self and the appraisal of emotions others, the former was considered a weak factor, with only 2 items, needing further development. Therefore, Ng et al. (2010) conclude that the SEIS seems to consistently capture three factors: appraisal of emotions in others, emotional regulation of the self, and utilization of emotions.

Two other studies expanding on Gignac et al. (2005) work and based on athletes' samples Davies, Lane, Devonport, and Scott (2010) and Lane et al., 2009) confirmed a 5-factor solution (appraisal of emotions in the self, appraisal of emotions in others, emotional regulation of the self, emotional regulation of others, and utilization of emotions), after removing 13 to 17 items lacking emotional content and, therefore, with doubtful content validity. Nevertheless, an inspection of the correlations between scales indicates high multicollinearity, especially in the case of utilization of emotions (ranging from .65 to .90).

In contrast, Kun et al. (2010) also tested previous solutions with confirmatory factor analysis and concluded the three-factor structure to be the most fitting and the six-factor as the worst, showing high multicollinearity, especially between emotional expression and two other factors (emotional regulation of the self and emotional regulation of others). However,

in order to confirm the three-factor model (with 24 items) the authors had to assume covariance between error terms in 5 pairs of items (3-10, 5-25, 7-27, 17-20, and 24-30), indicating some redundancy. If the redundant items were removed from the model, the final solution would contain only 19 items out of the original 33.

In a different line of research, a recent IRT analysis has also indicated the presence of structural problems in the 5-point rating scale used with this measure (Kim, Wang, & Ng, 2010), 4 misfitting items (including the 3 reversed-keyed items), as well as redundant items of low difficulty and absence of difficult items. Regarding the rating-scale, results showed that participants did not reliably distinguish between adjacent categories (especially at the lower end) and that a three-category structure would be a better alternative. Concerning misfitting items, previous research as also found reversed-scored items to demonstrate weak factor loadings and that fits are better when all items assess the factor in the same direction (e.g., Lane et al., 2009).

ECI. The Emotional Competence Inventory (ECI) was developed by Boyatzis, Goleman, and colleagues to assess the emotional competencies identified by Goleman (1998) and defined as learned capabilities based on EI that result in exceptional performance in organizations. Departing from a competency assessment questionnaire developed by Boyatzis in 1991, the Self-Assessment Questionnaire (SAQ), Boyatzis and Goleman rewrote items for the non-cognitive competencies and created additional ones for competencies not addressed in SAQ, in order to build the ECI (Boyatzis, Goleman, & Rhee, 2000). In 1999 the ECI was revised and refined with the collaboration of Hay Group, who commercializes this measure.

The ECI is a 360º assessment that includes self-ratings and other-ratings format (e.g., peer and supervisor). It is now in its version 2 (ECI 2.0), which comprises 73 items assessing 18 competencies organized into four clusters (Byrne, Dominick, Smither, & Reilly, 2007; Wolff, 2005): *Self-awareness*, which includes emotional self-awareness (3 items), accurate self-assessment (4 items), and self-confidence (4 items); *Self-management*, which includes emotional self-control (4 items), trustworthiness (4 items), adaptability (5 items), achievement orientation (4 items), initiative (4 items), and optimism (4 items); *Social awareness*, which includes organizational awareness (4 items), service orientation (4 items), and empathy (4 items); and *Relationship management*, which includes developing others (4 items), inspirational leadership (4 items), influence (4 items), change catalyst (5 items), conflict management (4 items), and teamwork & collaboration (4 items). The rating scale is based on six behavioural anchors, reflecting the frequency with which the person demonstrates a

specific behaviour or nature expressed in each item, from (1) "Never" to (5) "Consistently" and including (6) "Don't Know".

The ECI also includes a university version (ECI-U) to provide an assessment of students' EI competencies. The instrument has 63 items to assess 21 competencies, in the same four clusters. Three extra competencies were added (Conscientiousness, Communication, and Building bonds) and Transparency was renamed Trustworthiness. The rating scale does not include the "don't know" response.

Internal consistency coefficients for self-ratings reported in the ECI Technical Manual for Self-awareness, Self-management, Social awareness, and Relationship management were .61, .79, .71, and .92, respectively. In an independent study (Byrne et al., 2007), the corresponding values were: .52, .83, .70, and .87. In both cases, the Self-awareness scale seems to be the most fragile. At the competencies' level the Technical Manual reports reliabilities ranging from .47 (Conflict Management) to .76 (Inspirational Leadership) with an overall average reliability of .63.In terms of other-rating Cronbach's alphas ranged from .68 (Transparency) to .87 (Emotional Self Awareness) with an overall average reliability of .78, suggesting that other-report is more reliable than self-report format (Wolff, 2005).

The independent confirmatory factor analysis by Byrne et al. (2007) obtained good fit indexes for both the four-factor and the one-factor model, reporting non-significant differences between them. According to Gignac (2010), these results suggest that the ECI measures only a single, global EI factor, making the use of subscale scores doubtful. Gignac (2010) posits that this is probably due to the limited number of items that define each subscale, but we believe that the exaggerated number of subscales might also be responsible for this. Most of them seem to be measuring very similar constructs that were artificially separated and that could be grouped only in two main areas – personal and social competencies – as was proposed by Goleman in the first place.

Regarding discriminant validity the results obtained in (Byrne et al., 2007) study suggested that the factor structure of ECI was distinct from the factor structure of the Big Five personality dimensions. However, evidence for convergent validity was weak, since the magnitude of the correlations with judges' ratings of emotional competent behaviours demonstrated during a leaderless group discussion was quite small (from .17 to .25). Moreover, although ECI self-ratings had small, positive relationships with several criteria of work-related outcomes, these relationships (with one exception) disappeared after controlling for personality and age. This supports Mcenrue and Groves' (2006) suggestion that the ECI offers little incremental value over existing personality tests, based on previous research.

As pointed by Gignac (2010), although the ECI items' are workplace relevant, it includes characteristics which look more closely related to outcomes of EI, than components of EI itself (e.g., Service Orientation, Teamwork, Inspirational leadership). Moreover, the measure appears to assess competencies that are not necessarily emotional (e.g., Change catalyst or Flexibility in handling change), while excluding relevant ones, like adequate expression of emotions, or using emotions to redirect thinking and assist decision-making (Mcenrue & Groves, 2006). Finally, it attempts to measure competencies with questionnaires, which in fact assess peoples' perception of typical behaviour.

Therefore, practitioners and researchers should be aware of these issues when deciding which EI test to use and for what purpose. Nevertheless, the Technical Manual adverts that the appropriate use of the ECI is for developmental purposes only and not for administrative decisions (e.g., selection, promotion, salary).

EIA. The Emotional Intelligence Appraisal™ (EIA) is a 28-item questionnaire designed to assess behaviour demonstrative of EI skills based on Goleman's (2001) four-factor model. It was developed by Bradberry and Greaves for TalentSmart and provides an overall score, as well as a score in each of the four components: Self-awareness includes six items (e.g., "You have confidence to your abilities"), Self-management includes nine items (e.g., "You try to make up in every situation, whether good or bad"), Social awareness includes five items (e.g., "You understand the feelings of others") and Relationship management includes eight items (e.g., "You are coming along well with others"). According to Bradberry and Su (2006), the items were written as "behavioural impact statements" to measure the effect specific behaviours have on an individual's environment and those around them. In lie with this, they are rated on a six point frequency scale, from "never" (1) to "always" (6). In addition to the self-report format (Me Edition), the authors also developed a 360º format (MR Edition) and a group format (Team Edition).

Although the authors reported Cronbach alpha's ranging from .85 to .96 (Bradberry & Su, 2006) with a USA sample, a recent study conducted in Iran (Khalili, 2011) obtained lower but acceptable values (around .80). This discrepancy might be due to cultural differences, but we also must note that (Bradberry & Su, 2006) did not find the four hypothesized factors with this measure, but only two, which they did not identify. Therefore, the internal consistency values were probably calculated based on the *a priori* theoretical distribution of the items through the four factors. This might have inflated their results.

Overall, we believe the main limitation of this measure is that the authors claim to be assessing skill-based EI, while using questionnaires. Whether in self-report or other-report

format, even if the items are written in behavioural terms, in fact, they are measuring typical performance (or people's beliefs about them).

EQ-i. The Emotional Quotient Inventory (EQ-i; Bar-On, 1997) was the first commercial instrument available to measure EI, distributed by Multi-Health System (MHS). This 133-item questionnaire was designed to assess Bar-On's model (1997) of emotional-social intelligence (ESI) and estimates not only the EI level, but also an affective and social profile.

The EQ-i includes 15 subscales, grouped in five broad categories, as follows (Bar-On, 2006; Petrides & Furnham, 2001): (1) Intrapersonal includes five scales: *Self-Regard* with eight items (e.g., "Looking at both my good and bad points I feel good about myself"), *Emotional Self-Awareness* with eight items (e.g., "I'm in touch with my emotions"), *Assertiveness* with seven items (e.g., "When I'm angry with others I can tell them about it"), *Independence* with seven items (e.g., "I tend to cling to others" [R]), and *Self-Actualization* with nine items (e.g., "I try to make my life as meaningful as I can"); (2) Interpersonal includes three scales: *Empathy* with seven items (e.g., "I'm good at understanding the way other people feel"), *Social Responsibility* with seven items (e.g., "I like helping people"), and *Interpersonal Relationship* with eight items (e.g., "I'm unable to show affection" [R]); (3) Stress Management includes two scales: *Stress Tolerance* (with eight items (e.g., "I can handle stress without getting too nervous") and *Impulse Control* with nine items (e.g., "It is a problem controlling my anger" [R]); (4) Adaptability includes three sub-scales: *Reality-Testing* with eight items (e.g., "I can easily pull out of daydreams and tune into the reality of the immediate situation"), *Flexibility* with eight items (e.g., "It's easy for me to adjust to new conditions") , and *Problem-Solving* with eight items (e.g., "In handling situations that arise, I try to think of as many approaches as I can"); and (5) General Mood includes two scales: *Optimism* with seven items (e.g., "I generally hope for the best") and *Happiness* with eight items (e.g., "It's hard for me to enjoy life" [R]). The instrument also includes validly indices, such as an inconsistency index (assesses contradicting responses), as well as positive and a negative impression scales. Raw scores are converted into standard scores or "EQ" ("Emotional Quotient"), based on a mean of 100 and standard deviation of 15, to resemble IQ (Intelligence Quotient) scores.

A 51-item version of the EQ-i (EQ-i:Short; Bar-On, 2002) was also developed to assess the main five components, as well as inconsistency and positive impression. Both forms have been translated into several languages and normative data collected in approximately 15 countries.

A 60-item youth version (EQ-i: YV) for children and adolescents (aged between 7 and 18 years) has also been developed by Bar-On and Parker (2000), who reported high correlations between this version and the adult version, as well as adequate internal reliabilities and 3 week test-retest reliabilities (from 0.84 for the intrapersonal scale to 0.89 for the total EI scales). A 30-item short-form for the youth version, the EQ-i: YV (S), was also developed by the same authors (without General Mood and the inconsistency index). A recent study has confirmed the structure of this form with an Hungarian sample , but only after eliminating 6 items (Kun et al., 2011). In addition to self-reports observer forms were also developed for parents and teachers as a complementary assessment. Likewise, complementary to the adult version is the EQ-360, developed by Bar-On and Hadley (2003) for use primarily in organizational settings. This multi-rater tool consists of 88 items that ask observers (managers, peers, subordinates, clients, family/friends, or others) to rate a particular individual's EI, providing a 360º outlook on the total EI, the 5 composite scales, and the 15 subscales.

A quick search with the keyword "EQ-i" as a topic in the ISI Web of Knowledge (November 2011) produced 71 results, including 66 articles, 5 proceedings' papers, three reviews (one of which is our meta-analysis linking EI with health; Martins et al., 2010) and one meeting abstract. An analysis of authorship reveals that only four papers were written by Bar-On and that there is a diversity of authors involved in research with this measure. This amount of published studies is probably due to the fact that the EQ-i was one of the first measures of EI and publications stared more than 10 years ago, in 2000. The preferred journal for publication was *Personality and Individual Differences,* with 19 papers.

Among these papers some identify important conceptual and psychometric problems that are relevant to present here. For instance, Palmer, Manocha, Gignac, and Stough (2003) reported that the results of their exploratory factor analysis suggested a six-factor solution (supported by a confirmatory factor analysis), failing to sustain both the 13-factor structure reported by Bar-On (1997) and the theoretical 15-factor model of ESI. Moreover, this six-factor structure is considerably different from Bar-On's (1997) second-order five-factor model, with only the Interpersonal dimension's subscales (Empathy, Social Responsibility Interpersonal and Relationship) clustering together according to the original proposal. However, Wood et al. (2009) state that these results should be interpreted with caution due to the small sample size (377 participants) compared to the number of parameters included in the analyses.

Additionally, Bar-on (2006) describes an unusual process to validate his proposed factor structure. First, he reports that the exploratory factor analysis revealed only 13 factors instead of 15 and identified five problematic factors (Self-Actualization, Optimism, Happiness, Independence, and Social Responsibility). Then, he states that confirmatory factor analysis based solely on the remaining 10 factors supported this solution. According to the author, these 10 factors represent the key components of ESI, while the other five factors are considered additional correlates and facilitators. The same rationale was applied to the development of the EQ-i: Short, which was derived via a series of exploratory factor analyses based only on the first four conceptual clusters (intrapersonal, interpersonal, stress management, and adaptability), then the items from the fifth (General Mood) were subject to a confirmatory factor analysis and added to the others (Wood et al., 2009). In line with this, the calculation of the total EI score was revised to include only the first four conceptual clusters, with the general mood score calculated separately (Wood et al., 2009). A very recent study by Parker, Keefer, and Wood (2011) has confirmed the four-factor structure for the EQ-I: Short. These authors state that General Mood is not part of the model but a qualifier for the measure, assessing the general level of emotional positivity or negativity. Although the authors reported moderate to high levels of internal consistency (Cronbach's alpha coefficients ranged from .75 to .87), they also acknowledge the presence of several correlated errors between similarly worded items, which violates the independence assumption and may have inflated internal consistency values up to .02 to .06.

According to Pérez et al. (2005), another important limitation of the EQ-i is the inclusion of conceptually irrelevant facets (e.g., Problem solving, Reality testing, Independence), while missing relevant ones, such as the perception, expression and regulation of emotions. As pointed by Palmer, Manocha, et al. (2003) the EQ-i seems to offer an index of psychological health and ability to cope with environmental demands and pressures, given the convergent validity with measures of psychological well-being. This is congruent with its origins, since it was converted from a well-being inventory to an EI questionnaire (J. C. Pérez et al., 2005).

Finally, Petrides (2010) criticises the operationalization of Bar-On's (1997) model via self-report, because it implicitly assumes that EI " abilities", "competencies" or "skills" can be validly measured with self-perceptions. According to this author, this is a major threat to the validity of this model.

Probably, in response to some of these critiques and also based on the feedback from worldwide users of this questionnaire, a new version emerged in 2011, the EQ-i 2.0. This

revised version with some items reworded and others added was renormed and the 15 factorial structure was generally confirmed (Bar-On, 2012). According to Multi-Health Systems' site (www.mhs.com), the normative sample includes 4,000 self-report ratings from adults residing in the U.S. (90% of the sample) and Canada (10% of the sample). Although including the same number of scales and items as the original EQ-i, version 2.0 was rearranged as follows: the intrapersonal domain was divided in two – self-perception and self-expression; Emotional Self-Awareness was divided in two subscales.

Genos EI. The Genos Emotional Intelligence Inventory (Genos EI) is a 360º measure designed specifically for workplace applications and commercialized by Genos International. According to Gignac (2008), this measure was developed in 2006 and has evolved from the Swinburne University Emotional Intelligence Test (SUEIT; Palmer & Stough, 2001). It aims to cover the EI construct comprehensively and it is based on the Genos EI seven-factor model, a revised version of the SUEIT's five-factor model. Although the seven-factor model could be recovered from the SUEIT, a recent study has shown the superior fit of the Genos EI, as well as improved internal consistencies, ranging from .74 at the subscale level to .96 at the global level (Gignac, 2010). Therefore, the Genos EI is recommended by the authors, instead of the SUEIT both in professional and academic settings.

Palmer, Stough, Harmer, and Gignac (2009) argue that before the Genos EI (and its predecessor) existent measures lacked practical utility, because they were either not workplace relevant (e.g., MSCEIT, TEIQue) and/or too complex (e.g., EQ-I, ECI), and/or took too long to complete (e.g., MSCEIT, EQ-i, TEIQue). As the authors note, the Genos EI assesses how often people demonstrate emotionally intelligent workplace behaviours and not EI *per se*.

Currently, it includes a full version with 70 items, a concise version with 31 items and a short inventory with 14 items (the only one developed for non-commercial research purposes and freely available). The full version comprises seven factors measured by 10 items each (Gignac, 2010): (1) *Emotional Self-Awareness* (perceiving and understanding own emotions; e.g., "I fail to recognize how my feelings drive my behaviour at work."[R]); (2) *Emotional Expression* (effectively expressing own emotions; e.g., "When I get frustrated with something at work, I discuss my frustration appropriately."); (3) *Emotional Awareness of Others* (perceiving and understanding others' emotions; e.g., "I find it difficult to identify the things that motivate people at work." [R]); (4) *Emotional Reasoning* (using emotional information in decision-making; e.g., "I consider the way others may react to decisions when communicating."); (5) *Emotional Self-Management* (managing own emotions; e.g., "I engage

in activities that make me feel positive at work."); (6) *Emotional Management of Others* (positively influencing the emotions of others; e.g., "I am effective in helping others feel positive at work."); and (7) *Emotional Self-Control* (effectively controlling own strong emotions; e.g., "I fail to control my temper at work." [R]). The first two factors were aggregated in SUEIT under the label "Recognition and expression", as well as both Management factors (self and others), under the label "Emotional Management".

The rater version contains similar items, but that are phrased in the third person. For example (Palmer et al., 2009): (1) "Is aware when he/she is feeling negative at work"; (2) "Expresses how he/she feels at the appropriate time"; (3) "Demonstrates an understanding of others' feelings at work"; (4) "Asks others how they feel about different solutions when problem solving at work"; (5) "Responds to events that frustrate him/her at work effectively"; (6) "Creates a positive working environment for others"; and "Demonstrate excitement at work appropriately". The rating scale is based on "how often" each behaviour is demonstrated.

MEIA. The Multidimensional Emotional Intelligence Assessment (MEIA; Tett, Fox, & Wang, 2005) is a 116-item self-report measure designed to measure the 10 dimensions of the (Salovey & Mayer, 1990) model, grouped into three areas: (a) Appraisal and Expression of Emotion (in self and others, verbal and nonverbal), (b) Regulation of Emotion (in self and others), and (c) Utilization of Emotion (flexible planning, creative thinking, redirected attention, and motivation).

A quick search with the keyword "MEIA" as a topic in the ISI Web of Knowledge (November 2011) returned only one publication by Barchard and Christensen (2007). A search by the authors of the instrument revealed only more publication regarding this measure: Tett and Fox (2006). We also found another paper by (Gardner & Qualter, 2010) comparing this instrument with two other measures (the SEIS and the TEIQue) regarding concurrent and incremental validity. The authors of this study concluded that the predictive value of the MEIA and the SEIS is comparable regarding global trait EI, but the MEIA is more useful when using lower level facets to predict criteria. This seems congruent with Barchard's and Christensen (2007) study, who obtained adequate fit for the 10-dimensional model, but found that the higher-order factors were not able to account for the relationships between the first-order factors. Therefore, they recommended using the scale scores, instead of the higher-order factors' scores.

Another interesting finding based on this instrument is that, like Tett and Fox (2006), Barchard and Christensen (2007) also obtained better fit when the higher-order factors were

modelled according to the primary distinction between self and other, instead of the distinction between appraisal and regulation of emotions.

Overall, it seems that this measure has not received much attention in research settings since its creation, perhaps due to its length, when compared to the SEIS (which is also based on the same theoretical model) and/or to the fact that it is now a commercial test (Sigma Assessment Systems, Inc.). Currently, the MEIA counts also with a workplace version (MEIA-W), which announces norms based on the responses of 653 working adults from a variety of job categories and internal consistencies ranging from .60 - .89 for the ten scales (median = 78.5).

SREIS. The Self-Rated Emotional Intelligence Scale (SREIS) was developed by (Brackett, Rivers, Shiffman, Lerner, & Salovey, 2006) to map onto the Mayer and Salovey (1997) ability model and the emotional abilities measured by the MSCEIT. To develop this instrument the authors first examined and adjusted items from other EI scales, such as the TMMS (Salovey, Mayer, Goldman, Turvey, & Palfai, 1995) and the SEIS (Schutte et al., 1998) and created additional items to cover all four EI abilities adequately. An initial set of 34 items were chosen, after an independent group of graduate students analysed the content validity of each one and preliminary exploratory factor analysis suggested the hypothesized four-factor solution. However, after analysing factor loadings several items were removed. The final version consists of 19 items, such as: "By looking at people's facial expressions, I recognize the emotions they are experiencing" (Perceiving Emotion); "I am a rational person and I rarely, if ever, consult my feelings to make a decision" (Use of Emotion); "I have a rich vocabulary to describe my emotions" (Understanding Emotion); "I have problems dealing with my feelings of anger" (Managing Emotion in self); and "When someone I know is in a bad mood, I can help the person calm down and feel better quickly" (Social Management). The authors computed a total EI score by averaging across the scales and reported a good internal consistency for the full scale (.84). Although the correlation between the MSCEIT and the SREIS was significant, the relationship was not strong (r [287] = .19, p <.01).

Besides the original paper proposing the SREIS, we found a recent study by Choi, Kluemper, and Sauley (2011), who included this measure to test the impact of faking in the predictive validity of EI.

TEIQue. The Trait Emotional Intelligence Questionnaire (TEIQue) is based on trait EI theory and was designed by a combination of the construct-oriented and inductive approaches to scale construction (Petrides, 2011). Based on a content analysis of the relevant literature, Petrides and Furnham (2001) identified 15 facets included in different operationalizations of

EI (e.g., Bar-On, 1997; Goleman,1995 and Salovey & Mayer, 1990) and concluded that none of the existent measures at that time covered the trait EI domain fully. This led them to later develop the TEIQue to comprehensively measure the construct (Petrides & Furnham, 2003).

TEIQue includes 153 items organized around four factors and 15 subscales, as follows (Moïra Mikolajczak et al., 2007; Petrides & Furnham, 2003): Well-Being comprises three facets - *Self-esteem* with 11 items (e.g., "I believe I'm full of personal strengths"), *Trait Happiness* with eight items (e.g., "Life is beautiful"), and *Trait Optimism* with eight items (e.g., "I generally believe that things will work out fine in my life"); Self-Control comprises three facets - *Emotion regulation* with 12 items (e.g., "When someone offends me, I'm usually able to remain calm"), *Stress management* with 10 items (e.g., "I'm usually able to deal with problems that others find upsetting"), and *Impulsiveness (low)* with 9 items (e.g., "I tend to get 'carried away' easily" [R]); Emotionality comprises four facets - *Emotion perception (self and others)* with 10 items (e.g., "I often find it difficult to recognize what emotion I'm feeling" [R]), *Emotion expression* with 10 items (e.g., "Others tell me that I rarely speak about how I feel" [R]), *Relationship skills* with nine items (e.g., "I generally don't keep in touch with friends" [R]), and *Trait Empathy* with nine items (e.g., "I find it difficult to understand why certain people get upset with certain things" [R]); and Sociability comprises three facets - *Social competence* with 11 items (e.g., "I can deal effectively with people"), *Emotion management (others)* with 9 items (e.g., "I'm usually able to influence the way other people feel"), and *Assertiveness* with nine items (e.g., "When I disagree with someone, I usually find it easy to say so"). Two additional subscales do not belong to any particular factor, but contribute to the total score: *Adaptability*, which includes nine items (e.g., "I usually find it difficult to make adjustments in my lifestyle." [R]) and *Self-motivation*, which includes 10 items (e.g., "I tend to get a lot of pleasure just from doing something well.").

Several versions and forms are currently available. For adults there are three forms, the TEIQue v. 1.50 with 153 items, measuring 15 facets, four factors, and global trait EI; the TEIQue-SF, a short form with 30 items, assessing only global trait EI; the TEIQue-360 for peer or 360 degree ratings on the total 153 items; and the TEIQue-360S, a short form with 15 items for peer or 360 degree ratings on the 15 facets (Petrides, 2009). For adolescents there are two forms for ages 12/13 to17 years: the TEIQue-AF with 153 items, measuring 15 facets, four factors, and global trait EI; and the TEIQue-ASF, a short form with 30 items, assessing only global trait EI (Petrides, 2009). For children there are also two forms for ages 8 to12 years: the TEIQue-CF with 75 items, assessing nine facets and global trait EI; and TEIQue-

CSF, a short form with 36 items, assessing only global trait EI (Mavroveli, Petrides, Shove, & Whitehead, 2008).

This instrument has also been translated into several languages, such as Chinese, Croatian, Dutch, French, Georgian, German, Greek, Hungarian, Italian, Japanese, Malay, Norwegian, Polish, Portuguese, Serbian, Spanish, and Turkish. All TEIQue forms, versions, and adaptations are available, free of charge, for academic research purposes (Petrides, Furnham, et al., 2007).

A quick search with the keyword "TEIQue" as a topic in the ISI Web of Knowledge (November 2011) produced 31 results, including 29 articles, an editorial and one review (our meta-analysis linking EI with health; Martins et al., 2010). More than a half of the papers (19) included the main creator of the instrument (K. V. Petrides), as an author and more than a third (11) were published in *Personality and Individual Differences*, a journal where the author is the Associate Editor. Nevertheless, several independent studies are starting to appear, showing the growing interest in this trait EI measure, since its first publication in 2003.

Several studies on the psychometric properties of the TEIQue have shown good results at the item level and at the global level, both with confirmatory analysis (e.g., Freudenthaler, Neubauer, Gabler, Scherl, & Rindermann, 2008; Mikolajczak, Luminet, Leroy, & Roy, 2007) and IRT techniques (Cooper & Petrides, 2010). A recent independent study (Gardner & Qualter, 2010) has shown that the TEIQue has better concurrent and incremental validity than the SEIS and the MEIA regarding multiple psychological criteria (aggression, loneliness, eating disorders, alcoholism, happiness, and life satisfaction).

TMMS. The Trait Meta-Mood Scale (TMMS) was developed by Salovey, Mayer, Goldman, Turvey and Palfai (1995) and is often used to measure trait EI, although it was not specifically designed for this purpose. Originally, it comprises 48 items and three subscales: Attention to Feelings (e.g., "I pay a lot of attention to my feelings"); Clarity of Feelings (e.g., "I am usually very clear about my feelings"); and Mood Repair (e.g., "Although I am sometimes sad, I have a mostly optimistic outlook"). Its factor structure has been confirmed by independent studies (e.g., Palmer, Gignac, Bates, & Stough, 2003). The original authors report good internal consistency for the three subscales (α = .86, .88, .82 for Attention, Clarity and Mood Repair, respectively) and present evidence of both convergent and discriminant validity. Modified versions with 30 items and 24 items have also been tested and validated in different languages (e.g., Fernández-Berrocal, Extremera, & Ramos, 2004; Queirós, Fernández-Berrocal, Extremera, Carral, & Queirós, 2005).

Its main limitation, however, is that it only assess a part of the EI construct (i.e., the ability to reflect upon and manage one's emotions), overlooking other major components of EI, namely those included in the interpersonal domain. Therefore, its utility as a measure of EI is restricted. Nevertheless, an important advantage is that it is freely available in the scientific literature for research purposes, in contrast to many commercial tests of EI.

WLEIS. Wong and Law Emotional Intelligence Scale (WLEIS; Wong & Law, 2002) is a short 16-item scale designed to assess the four EI dimensions proposed by Davies, Stankov and Roberts (1998), which were developed based on Mayer and Salovey's four-branch model (1997), after a comprehensive review and synthesis of the EI literature. These dimensions are measured with four items each and include: Appraisal and expression of emotion in one's self (e.g., "I have good understanding of my own emotions."), Appraisal of emotion in others (e.g., "I have good understanding of the emotions of people around me."), Regulation of emotion in one's self (e.g., "I am quite capable of controlling my own emotions."), and Use of emotion to facilitate performance (e.g., "I always set goals for myself and then try my best to achieve them."). A recent study confirmed the four-factor model for this measure and also demonstrated measurement equivalence between self-report and peer-report (Joseph & Newman, 2010b).

Together with another multi-sample cross-validation study, this instrument was found to have good convergent and discriminant validity relative to the Big Five personality dimensions via confirmatory factor analysis (Law, Wong, & Song, 2004). Internal consistencies for self-reported scores used ranged from .80 to .88 (Law, Wong, & Song, 2004; Wong & Law, 2002).

Although the WLEIS is an openly accessible, short, and psychometrically sound measure that is ideal for use in organizational research, a quick search in the ISI Web of Knowledge (November 2011) only returned eight publications, including seven articles and one proceedings' paper.

Main critiques to self-reported EI. Apparently, self-report scales are more attractive, probably because they cost less, they are easier and faster to administer than performance tests (Brackett et al., 2011). Indeed, most research in the area of EI uses this format especially in organizational settings. For example, in a recent review of the studies examining the relationship between EI and leadership, only one fourth of the studies used ability measures of EI (Walter, Cole, & Humphrey, 2011). However, self-reports are typically criticized for being potentially inaccurate due to response biases, such as social desirability or due to respondents inability to know how good they are at emotion-based tasks and to whom they should

compare themselves (Brackett et al., 2011). Nevertheless, as pointed by Mavroveli and Sánchez-Ruiz (2011) trait EI research can attempt to overcome this likely limitation by incorporating objective criteria in study design. For example, Telle, Senior, and Butler (2011) found that participants scoring high on TEIQue (especially in the sociability factors) made significantly better decisions in a computerised card gambling task compared to low scorers, after seeing an emotional facial expression (happy, neutral or fearful), for only 600ms, that was either consistent or inconsistent with the best decision. Therefore, independently of the accuracy of self-reported EI, results were associated with better performance on an objective criterion.

Many times researchers and critics have expressed their concerns about the possibility of distorting responses to measures of self-report EI in a socially desirable way (e.g., Van Rooy & Viswesvaran, 2004). Indeed, it is commonly pointed as major limitation and threat to the validity of these instruments. Consequently, this issue has received a considerable amount of researcher's attention, who have contributed with very interesting findings. In this section we will review the most recent and relevant studies in this area, including those that investigated also performance tests of EI.

Downey, Godfrey, Hansen, and Stough (2006) found a significant but weak relationship between the SUEIT and social desirability ($r = 0.27$, $p < 0.05$), sharing less than 10% variance. Results also showed that the EI scores did not significantly differ between two experimental groups: "anonymous and no feedback about EI" vs. "detailed feedback about EI". This suggests that the expectation of feedback did not impact responses on the EI measure. Therefore, the authors concluded that social desirability does not seem to substantially affect this measure.

In contrast, Grubb and McDaniel (2007) found that even when respondents who were identified as fakers based on the inconsistency and positive impression indexes of the EQ-i were excluded, there was still substantial faking (by .83 of a standard deviation), when instructed to respond as if they were applying for a job they would like to get. Similarly, Day and Carroll (2008) not only confirmed the susceptibility of the EQ-i to faking, but also the impact of faking on selection decisions. Using a simulated job application situation, they found that a large amount of individuals who would not have been selected based on their "honest-condition" scores would have been selected if "applicant-condition" scores were used. More recently, Hartman and Grubb (2011) confirmed these results: in the faking response condition, at least 62% of participants scored higher than the mean score obtained in the honest response condition. Moreover, they also found that the scale's factor structure was

not equivalent across the honest and faking response conditions, questioning its construct validity. Therefore, it has been claimed that this measure should not be used in situations where respondents may be motivated to present themselves in a socially desirable way, such as job selection or promotion decisions (Parker et al., 2011).

Whitman, Van Rooy, Viswesvaran, and Alonso (2008) used a Solomon four-group experimental design with honest vs. faking test instructions and previous vs. non-previous test exposure. The results showed that the SEIS is susceptible to intentional faking attempts, especially in the fake-bad rather than fake-good condition. Moreover, previous exposure to the test influenced participants' subsequent ability to fake, especially in the fake-good condition. Finally, cognitive ability and personality did not significantly influence faking, except for conscientiousness in the fake-bad condition. Overall, these results suggest that individuals are more able to lower their EI results than to increase them, but previous exposure to the test facilitates faking good, more than faking bad. Therefore, this should not be a major concern in work contexts (e.g., selection or promotion) unless an applicant or an employee would be given the same measure of EI twice, within a relatively short period of time (the time interval in the within-subject condition was only one hour in this study). Also, as noted by the authors just because people can forge their score, it does not necessarily mean that it will meet the preferred profile by the organization.

Using two self-report measures of EI (the SEIS and the SREIS), Choi et al. (2011) recently demonstrated by means of an experimental study, that while self-enhancing distortion may occur, it does not significantly affect their predictive power under a "normal applicant condition" (i.e., as if responses would be used to determine admission to a desired university). Only under maximal levels of social desirability their criterion validities is reduced. Indeed, the prediction of the criteria variables (life satisfaction, psychological distress and coping) was not attenuated in a moderate social desirability condition, but was somewhat attenuated when faking was maximized (i.e., intentionally fake responses to appear as favourably as possible). Moreover, controlling for social desirability did not bring significant improvement to EI's predictive validity. Overall, these results reveal that an inflated EI score is not necessarily an indication of a reduction in criterion validity, and that self-reports can still predict important outcomes even in the presence of socially desirable responding. This is an important finding for both researchers and practitioners, since these measures provide a useful and economic way of predicting individual outcomes.

In an attempt to extend previous findings obtained within the laboratory context, Lievens, Klehe, and Libbrecht (2011) examined real job-applicants' scores in a large

organization during a real selection process and found that they were higher and had less variance than employees' scores. Moreover, a meta-analysis combining their results, based on the WLEIS, with those of previous research showed that scores increase around 1 SD in applicant conditions, regardless of the type of setting, self-report EI measure, and design (within vs. between-subjects).

So far, we have been presenting the findings regarding self-report measures of EI, which are the most criticized in this respect. Nevertheless, some studies have also investigated the issue of fakability within ability tests of EI, namely with the MSCEIT. For example, Day and Carroll (2008) confirmed that the MSCEIT is less susceptible to faking than the EQ-i, because participants were unable to increase their scores on this ability test, in contrast with the self-report measure. However, in the "honest condition" both measures were positively correlated with self-deceptive enhancement and impression management scores. The authors argue that this is not surprising given that some aspects of EI, as measured by the MSCEIT, assess similar characteristics to social desirability, such as accurately reading and adequately responding to social situations. However, Christiansen, Janovics, and Siers (2010) recently found that participants who received "job applicant instructions" obtained significantly higher mean scores on the total MSCEIT and on two of the four scales (Perception and Integration). Nevertheless, comparing the mean shift for the ability and self-report measures (SEIS and TMMS) used in this study, the amount of distortion for the self-report was 2.64 times larger than that observed for the performance-based composite.

In light of these results, we believe that it is reasonable to conclude that both measures are associated with some degree of social desirability responding, although the ability format is less susceptible to this kind of influence. Of course, this is only relevant if we take social desirability as a response style. Reversing the traditional logic of research in this area, Mesmer-Magnus, Viswesvaran, Deshpande, and Joseph (2006) decided to investigate the role of EI in the explanation of social desirability. Rather than taking this variable as merely a response style and its variance as error, they conceptualized it as a personality construct. Regression analyses revealed that EI, as measured by the WLEIS, explains significant variance in social desirability, over and above self-esteem and over-claiming. Moreover, when EI was added to the equation, these variables were no longer significant predictors of social desirability. The most important EI dimensions were emotion regulation, use of emotion, and other-emotions appraisal. According to the authors, three alternative explanations could be given for this association between EI and social desirability: (1) high EI individuals know when, how, and where to engage in socially desirable behaviours in order to

get what they want; (2) high EI individuals actually behave in a more socially desirable manner; or (3) EI is susceptible to social desirability response bias. Regarding the latter possibility, the authors argue that no incentive to distort responses was given, as anonymity was guaranteed and no reward was promised for appearing to be more emotionally intelligent. Moreover, EI was more strongly correlated with unconscious response distortion (self-deceptive enhancement) than conscious response distortion (self-deceptive denial), indicating that individuals actually believe their responses. This is congruent with the findings from the above studies showing that faking generally occurs when participants are actually motivated to do so.

2.4 Neurological Bases

> *"Since 1994, an overwhelming volume of evidence, especially in neuroscience, has accumulated in support of the idea that emotional awareness and understanding is separate from intellectual intelligence, and these abilities directly impact human decision-making capabilities."* (Antonakis et al., 2009)

Drawing together emotions and intelligence can be seen as paradoxical, since emotions are usually seen as leading to irrational behaviour and disturbing cognition. The famous book "Descartes Error" (Damásio, 1994) can be considered a major cornerstone in the area of emotions, providing new insights into the relationship between emotion and reason. The idea that reason also depends on emotion to make good decisions was revolutionary, as most people would readily accept that the less emotion in this process, the better. Damásio (1994) makes the reader reconsider the notion of decision-making as a desirably rational process, by presenting a remarkable body of evidence of emotion's crucial role in the use of reason. He shows that impairment to portions of the brain responsible for emotion also impairs the ability to use reason or behave rationally. The famous cases of Phineas Gage and Elliot, who have suffered brain damage that has caused severe impairments of emotional processing, illustrate that pure reason was not sufficient for decision-making. Indeed, although their intelligence was intact, they were completely incapable of making wise decisions and function well in life. These remarkable observations were at the beginning of the modern era of the neuroscience of decision making (Naqvi, Shiv, & Bechara, 2006).

When it comes to our personal and social lives, we all know that we do not make our decisions by computing possible outcomes of every option or by doing statistical analysis. Instead, body states and emotions become associated with certain outcomes, influencing our

decisions. This is what Damásio (1994) calls "the somatic marker hypothesis" and he asserts that the ability to form and access somatic markers is central to the decision process. These connections between brain and body are commonly known as "gut feelings" or intuitions, generated in the anticipation of future events (Bechara, Damásio, & Bar-On, 2007). With experience, people associate good and bad "feelings" with certain positive or negative outcomes, enabling them to reduce the number of possible behavioural choices in specific situations, depending on their valence. In this sense, emotions are intelligent, because they tell us what is important in our lives. They contain valuable information that feeds decision-making, by filtering and focusing attention on what is most significant.

Recently, Damásio (2011) reaffirmed his "somatic marker hypothesis", i.e., that emotions become "qualifiers", working as internal guides and helping us to convey others certain signs, which can also guide their behaviours. Deprived of these signals, response options become more or less equalized, and the distinction between them becomes unclear. The result is usually a bad choice, suggesting that decision-making is a process guided by emotions. Moreover, Damásio (2011) asserts that the experience of emotions is as cognitive as any other perception and is dependent of both cortical and sub-cortical structures.

Although initially Damásio (1994) did not mention EI, he later connected it with his findings, together with Bechara and Bar-On. Bechara et al. (2007) presented results indicating that the neural circuitry that governs emotional experience and processing also underlies key aspects of EI, and that EI and cognitive intelligence are governed by different neurological areas of the brain. Moreover, patients with injury to the neural circuitry governing emotions and feelings exhibit low EI, suggesting that this circuitry underlies EI. For instance, using the EQ-i to measure EI in patients with important brain lesions in critical areas for emotional processing Bar-On, Tranel, Denburg, and Bechara (2003) found: (a) no significant difference between the experimental and control groups regarding the level of cognitive ability, (b) no significant correlation between cognitive ability and EI for the clinical sample, (c) significantly lower EI in the experimental group, and (d) a significant relationship between EI and the ability to make advantageous decisions.

Based on the analysis of patients with damage to the brain regions important for processing emotional information, Bechara et al. (2007) indicate the following four major neural structures as underlying EI: the amygdala, the insular and somatosensory cortex (ISSC), the orbitofrontal/ventromedial prefrontal cortex (OF/VMPFC) and the anterior cingulate cortex (ACC). According to these authors, the amygdala represents the neurological foundation of EI, being associated with the emotional self-awareness component. This

neurological structure responds automatically to potentially dangerous threats in the individual's environment, representing the first link between the awareness of emotions, the creation of feelings related to those emotions, and the control of emotions and expression of feelings. Hoffmann, Cases, Hoffmann, and Chen, (2010) also note that the amygdala is considered the central piece for the emotion-cognition interplay, given its centrality in the topological map and its widespread connections to other brain regions.

According to Bechara et al. (2007), the ISSC map emotions and convert them into feelings, enhancing emotional self-awareness and providing the neurological basis for empathizing with others as well as adhering to social conventions (social awareness or empathy). The OF/VMPFC governs the expression of feelings, social interaction and behaviour, as well as interpersonal problem-solving, including the ability to judge and make decisions. Finally, in the ACC bodily changes detected and transmitted by the ISSC are represented as feelings, contributing to emotional regulation, non-destructive expression of feelings and adherence to social conventions. This structure, in combination with the OF/VMPFC, is considered the most representative of the "intelligence" component of EI (Bechara et al., 2007).

Taken together, these findings offer neurological support for seven out of the 15 competencies of the Bar-On's ESI model, as represented in Table 7. According to Bechara et al. (2007) the two last components (interpersonal relationship and social responsibility) could be compacted in one dimension called social interaction (given that they are ruled by the same neurological entities). Therefore, this would generate a six-factor model of EI comprising emotional self-awareness, emotional control (impulse control), emotional expression (assertiveness), social awareness (empathy) and social problem-solving.

Table 7. *Neurological Bases for Bar-On's ESI Model*

Bar-On's ESI model		Neurological structures			
Clusters	Competencies	Amygdala	ISSC	OF/VMPFC	ACC
Intrapersonal	Emotional self-awareness	x	x		x
	Assertiveness			x	x
Stress management	Impulse control				x
Adaptability	Problem-solving			x	
Interpersonal	Empathy		x	x	
	Interpersonal relationship			x	x
	Social responsibility			x	x

Note. ISSC = Insular and Somatosensory Cortex, OF/VMPFC = Orbitofrontal/Ventromedial Prefrontal Cortex; ACC = Anterior Cingulate Cortex.

Table 7 shows that none of the general mood competencies proposed by the Bar-On's ESI model are included in this neurological mapping. Moreover, an independent study with adolescents and children, using the EQ-i: YV and functional magnetic resonance imaging (fMRI) during perception of fearful faces, also found no significant correlation between the general mood scale and brain activity, in contrast to the other four clusters (Killgore & Yurgelun-Todd, 2007). Taken together, these findings do not sustain an independent general mood cluster, at least from the neurological standpoint. On the other hand, all the interpersonal competencies are represented in this mapping, receiving a much stronger neurological support. Nevertheless, two of the interpersonal competencies seem to be governed by the same neurological entities, making them potentially redundant. Aggregating them into a single competence, as suggested by Bechara et al. (2007), results in only two interpersonal competencies, which are very similar to the "social" clusters of Goleman's model (social awareness and relationship management).

Curiously, assertiveness (emotional expression), which is considered as a part of the intrapersonal competencies cluster, seems to be governed by the same neurological structures as interpersonal relationship and social responsibility. This raises the question as to whether assertiveness would be better conceptualized within the intrapersonal or within the interpersonal domain. Although, at first glance, it looks more close to an intrapersonal competence, expressing emotions adequately is most significant in an interpersonal context, as a means to manage relationships with others. If this is the case, then the model supported by neurological evidence would have two main domains, one with a more intrapersonal nature, including emotional self-awareness and emotional control, and another with a more interpersonal nature, including social awareness, assertiveness, social interaction, and social problem-solving.

In a different line of research, findings with healthy children and adolescents support the data obtained with patients with lesions to the same neural circuitry (Killgore & Yurgelun-Todd, 2007). Moreover, these findings suggest that high EI individuals probably possess a more efficient and effectively functioning somatic marker circuitry, requiring less activation within the neural structures involved in emotional processing and in the emergence of somatic markers. Specifically, using the EQ-i: YV and neuroimaging during perception of fearful faces, results revealed that EI was negatively correlated with activity in the major structures of the emotional circuitry. Another interesting finding that confirms data obtained with patients is that regions of brain associated with cognitive intelligence were generally unrelated to EI and many of the regions that were found to correlate with EQ-i results are not usually

correlated with cognitive intelligence in brain-imaging studies. This suggests that EI involves several neural systems that are distinct from those involved in cognitive intelligence. However, there were a few regions that appear to be commonly activated across studies as well, raising the possibility that both kinds of intelligence may also share some cortical structures.

Although not conducting specific studies in this area, other authors have also cited Damásio's work to support EI in general and their models in particular. The most notable example is Goleman (2001b), who acknowledges the importance of the key components of the emotional circuitry for the EI competencies he proposed, such as self-awareness, self-management, social awareness skills such as empathy, and relationship management. But, while drawing on the findings of affective neuroscience, he provides a very similar rationale to support each of the four dimensions of his model. Essentially, the lesions that disconnect the amygdala from the prefrontal cortex are used as an explanatory mechanism for the difficulties in perceiving and regulating emotions, both in self and others. Therefore, it looks like a rather speculative and vague attempt to connect his model with neurological science.

Nevertheless, Goleman (2001b) calls the attention for the possibility that this circuitry is also instrumental for what he calls the motivational aspect of emotional self-management, i.e., the ability to sustain goal-directed behaviour. As he notes, the prefrontal cortex keeps reminding us of the positive feelings that will arrive when we attain our goals and, therefore, encourages us to continue striving towards them. In our view, this is an important aspect of EI that is not explicitly considered in Bar-On's model. Therefore, the reason why Damásio and Bechara adopted this particular model of EI is not clear, given that none of its components explicitly include the "use of emotions" in cognitive processes The justification presented by the authors is rather vague: "We have selected the Bar-On model to conceptually frame our discussion in this chapter because this comprehensive conceptualization of the EI construct offers an accurate description of the psychosocial domain of our research in this area" (pp. 273-274). An apparently valid alternative is Mayer & Salovey's (1997) model, since Bechara et al. (2007) also seem to assume that EI is a type of intelligence when they say that "Both sources of evidence, neurological and statistical, indicate that emotional and cognitive intelligence represent different types of intelligence" (p.284)?

In fact, some interesting findings have also been reported using the ability model and measure. For example, measuring EI with the MSCEIT in two groups of brain-damaged Vietnam veterans Krueger et al. (2009) found that strategic and experiential EI areas depend on distinct neural prefrontal cortex (PFC) substrates. While the ventromedial PFC damaged

group had lower strategic EI (understanding and managing emotions) the dorsolateral PFC damaged group had lower experiential EI (perceiving and using emotions). Interestingly, these groups did not differ in cognitive abilities. Therefore, this study supports not only the notion that EI has clear neural foundations, but also that it complements basic intellectual functioning. According to the authors, these findings are congruent with a previous study using the EQ-i (Bar-On et al., 2003), providing further evidence that different areas of EI depend on separate neural PFC substrates. Nevertheless, they do not examine the role of more broadly distributed structures (e.g., amygdala, insula, cingulate cortex, and parietal cortices) in subcomponents of EI.

In an effort to find out more about the complex biological processes that may underpin EI, Tarasuik, Ciorciari, and Stough (2009) reviewed relevant studies on the neurobiology of emotion and linked it with the conceptual model of Mayer and Salovey (1997). Based on this, they established some relationships between specific brain regions and particular EI abilities, summarized in Table 8. For example, according to the authors, research indicates that the amygdala is possibly involved in the ability to understand emotions, assisting in the recognition of emotion from facial expressions. Moreover, the amygdala seems to be also related to the use of emotions to facilitate reasoning, together with other regions (e.g., ventromedial prefrontal cortex, the nucleus accumbens, and the anterior cingulate cortex), revealing interacting patterns between emotion and cognitive tasks. Finally, different regions seem to be involved in the ability to manage emotions (e.g., the frontal and prefrontal cortex, the hippocampus, the locus coeruleus, anterior and posterior cingulate cortices, the insula, paralimbic elements and subcortical nucleus). Only few studies have observed variations in brain activity across high and low EI participants, speculating that neural efficiency may be an explanation for this difference. Therefore, the authors conclude that studies examining biological activity during EI test performance, with modern imaging techniques, are essential to ensure the validity of EI.

Table 8. *Neurological Bases for Mayer & Salovey Ability Model*

Mayer & Salovey ability model	Neurological structures			
	Amygdala	ISSC	OF/VMPFC	ACC
Perceiving emotions	x			
Using emotions	x		x	x
Understandimg emotions	x		x	x
Managing emotions		x	x	x

Note. ISSC = Insular and Somatosensory Cortex, OF/VMPFC = Orbitofrontal/Ventromedial Prefrontal Cortex; ACC = Anterior Cingulate Cortex.

Looking at Table 8 it becomes apparent that "using emotions" and "understanding emotions" are not distinguishable from the neurological point of view, at least according to the data reported by (Tarasuik et al., 2009). Therefore, we could argue that although the conceptual separation of these two abilities seems reasonable, it is apparently difficult to sustain in neurological terms. If this is the case, the reviewed studies seem to support a three-factor ability model with a clear distinction between perceiving and managing emotions, and an additional area of understanding/using emotions. Perhaps, these last abilities represent a two-way road, with the understanding component representing the bottom-up path (using thought to interpret emotions) and the using emotions component representing the top-down path (using emotions for cognitive purposes). Of course this is still speculative until more research is done in this area.

Very recently, Killgore et al. (2012) examined regional brain volumes' correlation with the two dominant models of EI (Ability and Trait), using the MSCEIT and the EQ-i. Based on a sample of 36 healthy participants they found positive associations between the total MSCEIT scores and the left insula grey matter volume, as well as between the strategic area (understanding and regulating emotions) and the left VMPFC and insular volume. On the other hand, the stress management scores of the EQ-i correlated positively with the bilateral VMPFC volume. Amygdala volumes were unrelated to both EI measures. The authors conclude that these results support the role of the VMPFC and insula as key nodes in the circuitry of EI.

At first glance, the ability model of Mayer and Salovey (1997) looks like a very promising proposal. First of all, taking EI as a kind of "intelligence" sounds more congruent with the label "EI". Secondly, proposing a performance measure to assess EI fitted well with the conceptualization of EI as an ability. Finally, the model explicitly included a component about the "use of emotions" to improve reasoning, which seemed congruent Damásio's (1994) findings. But, in the analyses of both Phineas Gage and Elliot cases, we recurrently find the expression "personality change" as a consequence of their specific brain damage, associated with systematic bad decision-making. And, this seems incongruent with the ability perspective of EI. If it's a matter of change in personality, than wouldn't EI be better conceptualized and measured as a personality construct? Moreover, Elliot had the necessary knowledge to act according to social norms in hypothetical situations in the laboratory. He could generate several possible action courses and enumerate their consequences, but he could not decide between them in real life situations. According to Damásio (1994, 2011), this was

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due to the fact that he could not value the diverse options differently, making the choice very difficult.

Taken together, these ideas present a problem to the conceptualization of EI as an ability and to its measurement with a performance test like the one proposed by Mayer & Salovey (i.e., the MSCEIT), in which there are right and wrong answers based on social conventions. Therefore, this kind of instrument assesses knowledge about emotions, and not what people normally do in real life situations. We may wonder if Elliot could obtain a good score in this ability test of EI, and yet behave in an emotional unintelligent way. In contrast, this would be most unlikely with a trait measure of EI as was shown in (Bar-On et al., 2003) study, where the experimental group subjects (i.e., with brain damage in the areas associated with emotional processing) exhibited significantly lower EI (measured as a trait) and significantly worse emotional and social functioning than those in the control group. The findings also demonstrated that EI is significantly related to the ability to exercise personal judgment in decision-making. Furthermore, Montgomery, McCrimmon, Schwean, & Saklofske (2010) reported that autistic participants scored significantly lower than controls on the EQ-i, but not on the MSCEIT, at the global level. Surprisingly, at the sub-scale level the autistic group performed significantly better than the normative group on three of the four MSCEIT scales. The authors suggested that abstract knowledge of emotion may be intact in autistic individuals, while their performance in real life circumstances is impaired.

In general, existing models of EI seem to emphasize emotional perception and management, i.e., the idea that emotions need to be recognized and regulated. Of course, in certain circumstances emotions can disturb reasoning and have negative consequences in terms of irrational behaviour. But, as Damásio (1994, 2011) points out the decrease or absence of emotions can also be an important source of irrational behaviour. And, this seems to be at the core of what we may call "the intelligence of emotions".

In sum, research linking neurobiological processes with EI is still in the beginning, but it seems that different lines of research, both examining patients and healthy individuals, as well as using self-report and ability measures of EI tend to converge to the idea that EI is distinct from cognitive processes in terms of brain architecture. Moreover, there appears to be some agreement as to the main structures associated with EI's key components. However, as Tarasuik et al. (2009) noted while existent studies have given some insight into the biological foundation EI, research directly examining these processes is scarce. In particular need are studies investigating brain activity during EI test performance, to warrant the validity of this construct.

Summary and conclusions

This chapter aimed to give a comprehensive outline regarding the state of the art in the conceptualization and measurement of EI. As we have seen, this construct emerged from the attempt to eliminate the traditional dichotomy between intelligence and emotions. Conventionally, emotions were considered as irrational and inconvenient intruders that disturbed the effective rational functioning. However, when neurological research began to show that emotions are not only inevitable but also necessary, namely for an effective social life, researchers began to think of them in a different way. After all, emotions contain information that helps decision making, i.e., they have their own intelligence.

The problem is that there is no agreement as to what EI is and how to measure it. Moreover, there is little consensus regarding the structure of EI with different models proposing different components. Basically, there are two different ways to conceive EI that come from two fundamentally divergent research traditions: as intelligence and as a personality trait. In the first case EI is considered as a specific kind of intelligence like verbal and numerical abilities, but specifically focused on emotions. In the second case EI is considered as a particular set of traits devoted to emotions. Consequently, EI can be measured with either maximal performance tests, such as the ones used in the ability domain or with typical performance measures, such as the ones used in the personality domain.

As we will see in the next chapter, this heterogeneity of approaches has given place to much confusion in the field of EI, making it difficult to compare results from different research streams. Therefore, we set ourselves to address three major challenges that will be discussed in detail in the following sections.

Chapter 3 – Research Streams and Current Challenges

As we have seen in the previous chapter, two essentially different measurement approaches have been used to assess EI: via maximal performance tests with "right" and "wrong" answers or via typical performance questionnaires (both with a self-report or other-report format). A pioneer meta-analysis comparing both kinds of measures concluded that they tap two different EI constructs (Van Rooy et al., 2005). Results showed that self-report measures of EI correlated highly (.71) among themselves, but had a very low correlation with performance tests of EI (.14). Moreover, their pattern of relationships with personality and cognitive ability (i.e., their nomological network) was almost opposite: while self-reported EI exhibited a higher correlation with personality (from .27 with agreeableness to -.40 with neuroticism) and a lower one with intelligence (.13), EI ability measures demonstrated a higher correlation with cognitive ability (.34) and a lower one with personality (ranging from .06 with conscientiousness to .18 with agreeableness). These relationships are summarized in *Figure 11*.
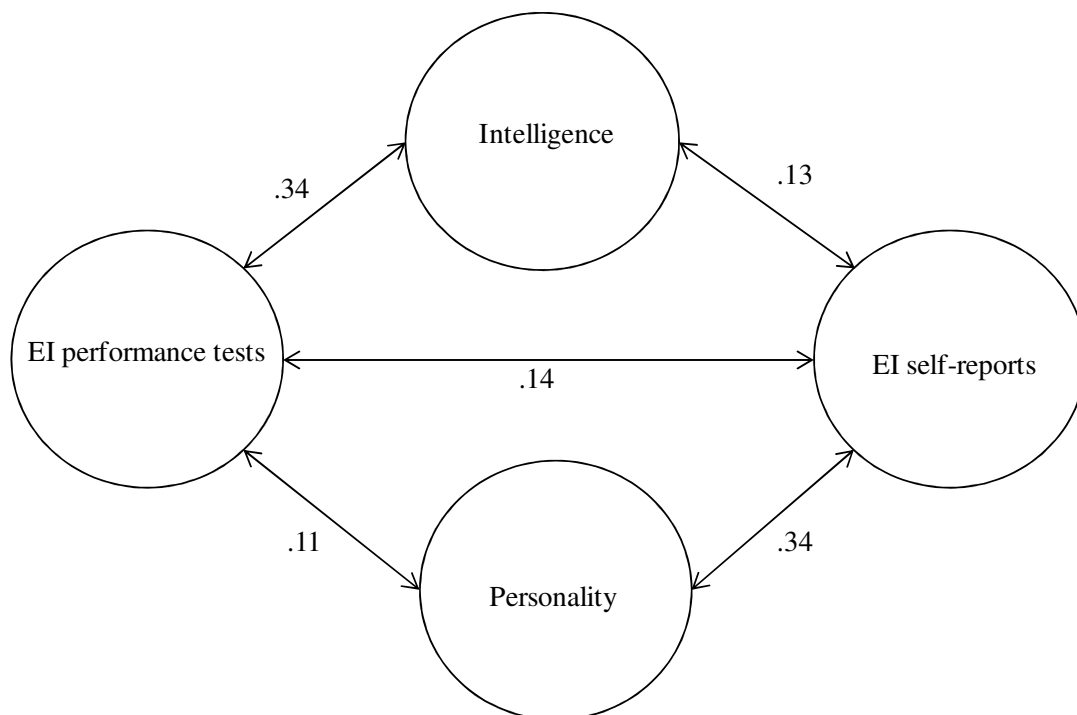
Figure 11. Nomological Network for EI

Nevertheless, Ashkanasy and Daus (2005) distinguished three streams of research, by combining the measurement methods with the theoretical models that the instruments intend to assess: while stream 1 uses ability-based models and measures (e.g., MSCEIT), stream 2 is based on the ability model of EI, but uses self-report or peer-report measures (e.g., WLEIS), and stream 3 is based on "mixed models" and uses self-report or peer-report measures (e.g., ECI and EQ-i). Although two recent meta-analysis used this categorization, their results support Van Rooy's et al. (2005) distinction based simply on the measurement method. For example, Joseph and Newman (2010a) found a small correlation (.12) between streams 1 and 2 (which used different measurement methods), while the correlation between streams 2 and 3 (both using self-reports), was much higher (.59). This clearly indicates that the method is more important to distinguish between constructs of EI than the theoretical model. Moreover, the pattern of relationships with personality and intelligence was similar, as shown in Table 9: stream 1correlated more highly with cognitive ability (.25) than streams 2 and 3 (.00 and .11, respectively), and the reverse was true regarding the Big Five (stream 1 correlated from .13 with conscientiousness to .29 with agreeableness and streams 2 and correlated from .29 with openness to .53 with neuroticism).

Also, O'Boyle et al. (2010) found a nomological network for EI similar to that of Van Rooy et al. (2005), as seen in Table 9: self-reported EI (streams 2 and 3) exhibited a higher correlation with personality (from .26 with agreeableness to -.54 with neuroticism) and a lower one with intelligence (.08 for stream 2 and .06 for stream 3), EI ability measures demonstrated a higher correlation with cognitive ability (.32) and a lower one with personality (from .11 with conscientiousness and extroversion to .26 with agreeableness). Nevertheless, these authors claimed that streams 2 and 3 are distinct based on the strength of their relationships with two personality traits. Specifically, stream 3 showed a significantly higher correlation with neuroticism, and extroversion (-.54 and .49, respectively), compared to stream 2 (-.40 and .32, respectively). In our view, this difference in the intensity of association is probably due to the fact that stream 3 measures are more comprehensive than stream 2 measures, inflating their correlations with personality. In fact, the results show that all stream 3 associations with the Big Five are higher, compared to stream 2, although those with neuroticism and extroversion are more expressive. Therefore, we believe that the sole distinction based on the method of assessment is more parsimonious and we see no advantage in considering also the distinction based on the theoretical model.

Table 9. *Construct Validity Meta-Analyses' Summary*

Personality	Meta-analysis (correlations with EI)									
and GMA		Stream 1		Stream 2		Stream 3			Stream 2/3	
Big-5	2005	2010a	2010b	2010a	2010b	2010a	2010b	2005	2010a	2010b
N	.08	.17	.16	.34	.40	.45	.54	.40	.40	.47
E	.09	.15	.11	.27	.32	.40	.49	.36	.34	.41
O	.14	.18	.18	.24	.30	.26	.39	.32	.25	.35
A	.18	.25	.26	.26	.26	.36	.38	.27	.31	.32
C	.06	.12	.11	.32	.38	.33	.38	.33	.33	.38
Mean (Big-5)	.11	.17	.16	.29	.33	.36	.44	.34	.32	.38
GMA	.34	.22	.32	.00	.08	.09	.06	.13	.05	.07

Note. Big-5 = Big Five personality factors; N = Neuroticism; E = Extroversion; O = Openness; A = Agreeableness; C = Conscientiousness; GMA = General Mental Ability; Stream 1 = ability model/performance measure; Stream 2 = ability model/self-report measure; Stream 3 = mixed or trait model/ self-report measure; 2005 = Van Rooy, Viswevaran & Pluta (2005); 2010a = Joseph & Newman (2010); 2010b = O'Boyle et al. (2010).

Overall, these studies show that it is important to distinguish between the two constructs of EI, based on their measurement method, not just because they are weakly correlated with each other, but also because they show very different patterns of association with two established psychological constructs: personality and cognitive ability. Hence we can derive two important challenges: to find a comprehensive integrative model that includes these different ways to look at EI and to examine the added value of EI in face of personality and intelligence. An important intermediate step is to find a core set of components that crosses the different models. Indeed, if we take into account the diversity of models presented in the previous chapter we easily become aware of the need to find some common grounds with which researchers can work.

3.1 Challenge 1: Bringing EI Approaches Together

In this section we will address the challenge of bringing EI approaches together. First, we will discuss the previous efforts in this direction and then we will present our proposal. According to Mikolajczak (2009) both ability and trait perspectives have merits, and there is no basis to dismiss one in favour of the other. In her opinion, each type of conceptualization and operationalization will fit better in a different context. Therefore, she proposed to integrate them in a unifying model of EI, encompassing three levels: knowledge, abilities, and traits or dispositions. While the first level refers to what people know about emotions and how to deal with emotional situations (implicitly or explicitly), the second level focuses on what

people can do, i.e., their ability to apply their knowledge in a real situation. For example, sometimes, people know what is the best strategy to deal with a given situation, but they lack the ability to implement it (e.g., positively reappraise stressful situations). Finally, the trait level refers to the tendency to behave in a certain way in emotional situations. For instance, sometimes, people have the knowledge and the abilities to behave in a certain way, but do not do so for dispositional reasons. These three levels are loosely connected and are hierarchically organized: knowledge does not always translate into abilities, which, in turn, do not always translate into practice, but knowledge underlies skill, which in turn underlies dispositions. Therefore, whereas lower levels do not necessarily involve higher levels, these are supposed to involve lower levels.

We believe this model is very useful to organise thinking and evidence about EI, representing a valuable attempt to bridge the gap between ability and trait EI perspectives. Nevertheless, we trust that there is still a missing piece and that a competencies level should also be included, i.e., the actual behaviours. According to Pérez-González (2011) we should discriminate not between two but three EIs. As pointed by the author, although a number of researchers use the terms "abilities", "skills" and "competencies" as synonymous, they come from very different research traditions. Goleman (2003) also asserted that EI and EI competencies are distinct. According to him although closely related, they are not at the same level, because one emerges from the other, i.e., EI competencies are based on a platform of EI abilities. This is what he called "apples and applesauce".

Outside the field of EI Roe (2002) proposed the "competence architecture model", which conceptualizes competencies as the roof of a roman temple, supported by three pillars – knowledge, skills and attitudes, which in turn are rooted on three heights - abilities, personality and other personal characteristics. While the three pillars and competencies are learned, abilities and personality are more stable characteristics. We believe this framework is useful for conceptualizing the different approaches to EI in combination with the previous proposals. As such, we propose a multilayer framework with the emotional traits, abilities, and knowledge representing the first three layers supporting the emotionally intelligent behaviour, visible in the form of emotional competencies. From the inner layer to the outer layer EI becomes more malleable and responsive to education, training and practice. *Figure 12* attempts to represent our proposal for conceptualizing the different approaches to EI, drawing on Roe's competencies model (Bartram & Roe, 2005; Roe, 2002) and the ideas presented by Goleman (2003), Mikolajczak (2009) and Pérez-González (2011).

Emotional Traits
What people tend to do

Emotional Abilities
What people can do

Emotional Knowledge
What people know

Emotional Competencies
What people actually do

Education, training & practice
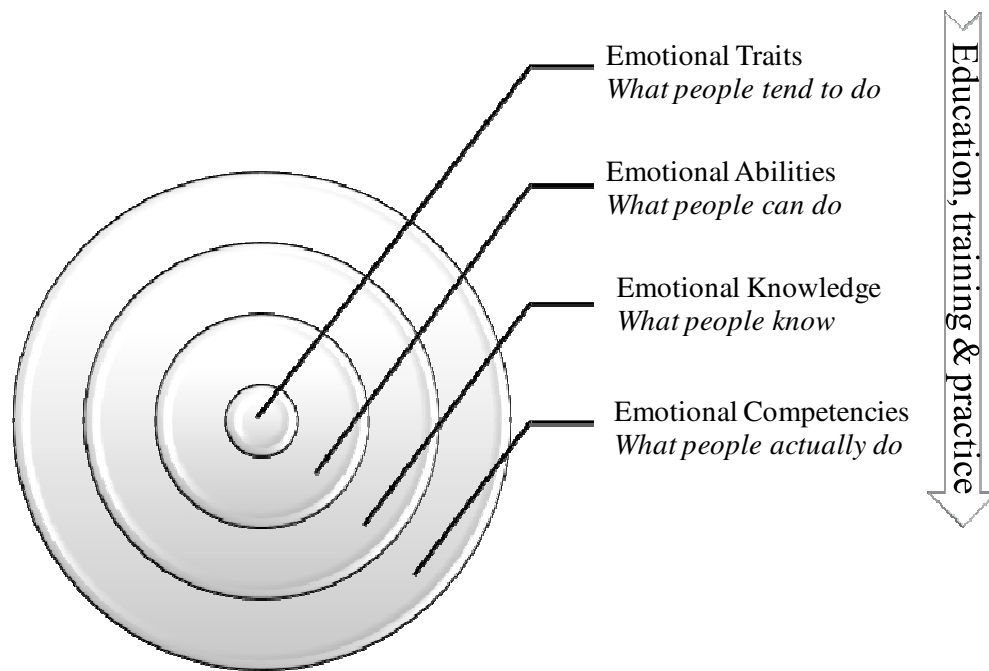
Figure 12. Proposed Multilayer Framework for Conceptualizing EI

In sum, this framework incorporates not only what people know about emotions, what they can do to deal with them and their tendencies to behave in a certain way when faced with emotional situations, but also what people actually do, i.e., their concrete behaviour in that context. The big challenge is to find a viable way to measure real EI competencies, if there is such a possibility in a test-like format. As noted by Pérez-González (2011), most researchers claiming to assess emotional competencies, in fact, are measuring emotional traits, even when using multi-rater or 360° formats such as the ECI. In our view, the measures available so far, only assess the three first layers of EI and researchers still need to find a way to assess directly the visible everyday behaviours in a valid and cost-effective way. Otherwise, we will keep on making inferences on emotional competencies, based on the emotional knowledge, abilities and traits.

We believe that this framework would also help researchers and practitioners direct their training efforts to the right target. As noted by Cartwright and Pappas (2008), the idea that organizations can benefit from promoting EI was probably responsible for the massive interest in the concept. Curiously, both ability and trait approaches claim that EI can be developed through training and experience. However, this is in contradiction with the traditional view that adult IQ and personality are relatively stable over time. As Mayer and Cobb (2000) asserted, although it does not make sense to speak of teaching an intelligence (i.e., ability EI), it is be more conceivable to teach emotional knowledge or emotion

understanding. Likewise, when conceptualizing EI as a trait the same question comes immediately to our mind: what can we do about it?

Until recently, the dominant perspective was that after adulthood, there is no subsequent change in personality traits. But, although personality traits are by definition "relatively enduring", recent studies have shown that they can change at any age (Roberts & Mroczek, 2008; Roberts, Walton, & Viechtbauer, 2006). Moreover, when these changes occur they tend to endure and they seem to be connected with specific life and work experiences (e.g., family, career). In this sense, personality can also be seen as an outcome and not only as a predictor. However research identifying the causal pathways for personality changes is still scarce (Roberts & Mroczek, 2008).

Likewise, Groves, McEnrue, and Shen (2008) found that it is possible to deliberately develop EI, after an intensive 11-week training program based on Mayer and Salovey's (1997) model. Using a sample of 135 fully-employed business students, results showed that the treatment group showed statistically significant EI improvements (measured via self-report before and after the training program) while the control group did not show any significant pre-/post-test differences. It is important to note that this program was designed for developmental purposes and that during the course, the treatment group received and discussed feedback with five different sources: peers, a coach, an external source of support (e.g. boss, spouse, or co-worker), the instructor, and their own reflections with reference to the goals they established. This may have worked as an important incentive to be honest and engaged in the whole process, increasing the chances for the success of the intervention.

Another recent experimental study (Kotsou, Nelis, Gregoire, & Mikolajczak, 2011) also showed that it is possible to develop emotion-related individual differences in adulthood, through a well-designed and short intervention (15 hours), with enduring benefits on mental, physical and social adjustment (lasting for at least 1 year). These positive results were not only perceived by the subject and others, but also accompanied by an objective reduction in cortisol secretion, a stress hormone. Interestingly, the baseline level of EI, but not the cognitive ability, significantly influenced the magnitude of EI changes, such that people starting with a lower level of EI improved significantly more (although both high and low EI people significantly benefited from the intervention). As noted by the authors, one important condition for improvement in this research may have been the motivation for change (participants were selected based on a motivation letter). Therefore, it is still uncertain whether these findings would hold if people were not particularly interested in changing, such as is often the case in training programs in organizational contexts. Nevertheless, this means

that deliberate change is possible and it is especially beneficial to those who need more improvement. But we cannot forget that this is only a valid conclusion for scientifically derived and rigorously tested interventions, like the one used in this careful experimental study. It would be unwise to generalize these results to all the training programs available in the market, which may lack proper scientific evaluation or validation both regarding their development and conduction (Matthews, Zeidner, & Roberts, 2012).

In a subsequent paper, Nelis et al. (2011) presented two well-designed experimental studies confirming that after an 18 hour training program it was possible to significantly and durably improve EI (over 6 months), both measured as a trait (TEIQue) and as an ability (with the STEU and an emotional regulation test similar to STEM), leading also to long-term significant changes in personality traits, such as extraversion, agreeableness and neuroticism. Moreover, the second experiment showed that participants who received training not only reported positive changes in their physical health, mental health, happiness, life satisfaction, and global social functioning, but their employability also increased, as assessed by a panel of human resource professionals. Overall, these findings support the idea that personality traits and EI are somewhat malleable, even in adulthood and that theoretically grounded EI programs may lead to a wide array of positive consequences in such diverse areas as health, social relationships and finding a job. The authors concluded that training EI not only increased emotion-related knowledge and abilities but also, the use of this knowledge and abilities in daily life. However, they seem to have inferred to the competencies level the results found at the trait and ability levels of EI, because they assessed EI with a trait measure (TEIQue) and two ability measures (which, in fact, measure emotional knowledge, instead of real abilities). Moreover, they use the terms emotional competence (EC) and emotional intelligence (EI) as interchangeable, throughout the paper, although they explicitly endorse the tripartite model proposed by Mikolajczak (2009), who is a member of their research team.

Therefore, it seems that adding a competencies level at the top of the three first layers, as the ultimate expression of EI, would help prevent the potential confusion among these different approaches to the construct. Measuring and developing EI at one level should not be confused with assessing and teaching EI at the other levels. Similarly, conclusions should be kept at the measurement or intervention level and not inferred to other levels.

Evidence from neuroscience is also encouraging regarding the possibility of developing EI. According to the notion of neuroplasticity, the brain has an ongoing faculty to shape itself through repeated experiences (Hoffmann et al., 2010). As such, the most frequently used neural connections are reinforced, while the ones less used are weakened. As Hoffmann et al.,

(2010) note, this suggests a window of opportunity for helping individuals to develop their EI repertoire.

Finally, we should note that besides Mikolajczak's (2009) integrative proposal, Seal and Andrews-Brown, (2010) also suggested an integrative model of EI that incorporates three approaches to EI, represented by Bar-on's, Goleman's and Mayer and Salovey's models. However, their proposal follows a rather different rationale and seems to have emerged independently, without acknowledging the previous one. Instead of suggesting different levels to integrate the disparate conceptualizations, Seal and Andrews-Brown, (2010) presented a moderated-mediation model where different EI approaches have specific roles. As seen in Figure 13, the dispositional or trait approach (or preferred patterns), represented by Bar-On's model is taken as an independent variable, while the competencies approach, represented by Goleman's model is taken as a mediator between emotional dispositions and outcomes (i.e., expected consequences, such as performance). Lastly, the ability approach, represented by Mayer and Salovey's model is taken as a moderator both in the dispositions - competence link and in the competence - outcomes link.
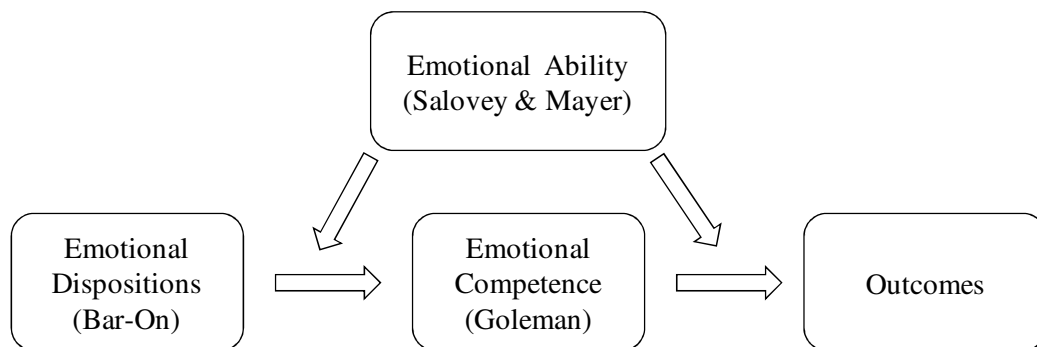
Figure 13. Seal and Andrews-Brown Integrative Model of EI

Although this integrative model has its merits and seems to be an interesting proposal, it suffers from several limitations, in our view. First, it is not sufficiently broad in order to embrace different models of EI within each approach, mixing conceptualizations, models and operationalizations. Specifically, it assumes that Bar-On's is the trait approach, Goleman's is the competence approach and that Mayer and Salovey's is the ability approach. Although these models are good prototypes of each approach, they are not necessarily the only option. If in the case of ability approach, the correspondence is almost automatic (because there is

only one ability model of EI), in the case of the dispositional or trait approach, there are other models that could be integrated (e.g., Petrides & Furnham trait EI model). Moreover, while Goleman's model speaks of competencies, the operationalization (ECI) is more close to a trait measure than a competencies one, as mentioned before. This makes it difficult to empirically test the mediated model proposed by Seal and Andrews-Brown (2010), as ECI and EQ-i could be measuring EI at the same level and, therefore, would not represent different approaches.

Another problem, in our view, is that although the authors declare that emotional competence may be seen as EI in action, they take emotional ability as a moderator variable. This precludes a direct influence in emotional competence, which does not seem plausible. Instead, emotional ability could be taken as an independent variable, together with trait EI. Alternatively, emotional ability could simply switch over with emotional dispositions, which would moderate de relationship between ability and competency, as well as between emotional competence and outcome variables.

3.2 Challenge 2: Searching for the Core Components of EI

After reviewing the extant literature regarding the nature of EI and proposing our integrative framework (challenge 1), we set ourselves to look for the core components of EI (challenge 2), before we go into the added value issue (challenge 3). As we have seen in Chapter 2, there is little consensus regarding the structure of EI and different models include different components. Several authors have noted that EI models are not necessarily contradictory or mutually exclusive and they may be more complementary than conflicting (e.g., Schutte et al., 1998; Ciarrochi, Chan, & Caputi, 2000). Moreover, Zeidner, Roberts, and Matthews (2008) stated that these approaches "are in need of systematic comparison and integration" (p.74). Although some attempts were already made in this direction (e.g., Palmer, Gignac, Ekermans, & Stough, 2007; Seal & Andrews-Brown, 2010), our approach targets the key constituents of EI, that emerge from a comparative analysis of Mayer and Salovey's (1997) model and Goleman's (2001b) model, summarized in Table 10.

Table 10. *Comparative Analysis of Mayer & Salovey's Model with Goleman's Model*

Goleman (2001)	Mayer-Salovey (1997)			
	Perceiving emotions	Using emotions	Understanding emotions	Managing emotions
Personal				
Self-awareness	Perceiving emotions in self			
Self-management		Mobilization of emotions		Regulating emotions in self
Social				
Social awareness	Perceiving emotions in others			
Relationship management				Regulating emotions in others

When contrasting these models (see Table 10), the first noticeable discrepancy is that, unlike Mayer and Salovey, Goleman makes a distinction between personal and social domains. Whereas the former authors highlight the difference between perceiving and managing emotions, irrespective of the referent, Goleman additionally emphasises the division between self and others. Tett and colleagues' findings (Tett et al., 2005; Tett & Fox, 2006) support the primacy of this distinction, compared to the appraisal and regulation of emotions distinction. Therefore, they suggest that models based on this distinction should be reconfigured according to the primal nature of the self-other orientation.

Another difference is that Goleman's model does not explicitly include the "using emotions" dimension. However, the idea that emotions can help one's thinking and actions seems implicit, when optimism (included in self-management) is considered essential to overcome obstacles. Consequently, we believe it is possible to reconcile this apparent disparity between these models.

Finally, an important divergence is that Goleman's model does not include the "understanding emotions" dimension, which has a strong cognitive nature. Possessing and

using a rich vocabulary to describe emotions is more closely linked to a purely verbal ability and Mayer, Roberts, & Barsade (2008) recently reaffirmed that this dimension is the one that has the highest correlations with verbal ability (.51 to .56).

Building on this comparative analysis and the important self-other distinction testified by Tett and colleagues, we propose a multifactor model comprising five components, aggregated in three main dimensions: Intrapersonal-EI – perception and regulation of one's own emotions, interpersonal-EI – perception and regulation of other people's emotions, and mobilization of emotions – using emotions to sustain goal-directed behaviour. Moreover, we conceptualize this last component as a distinctive feature of EI, representing the "other side of the coin" and assuring the balance between the emotional and cognitive side of EI. In simple words, we suggest that the intra and interpersonal components represent "the capacity to reason about emotions" and that mobilization of emotions represents the capacity to "enhance thinking and behaviour" (Mayer, Salovey, & Caruso, 2004b, p.197).

3.2.1 Testing the Core Components Model of EI

To test our proposal we first reviewed the instruments available in the scientific literature for research purposes. A detailed analysis was already presented in Chapter 2 for each of the main measures. As pointed out in that chapter there are pros and cons for both performance and self-report EI measures. However, if we take into consideration the practical side (e.g., cost-effectiveness, availability), of special relevance in organizational research settings, self-report measures of EI seem to be a better choice, provided that they are properly designed for good reliability and validity (Law et al., 2008).

Also, as we have seen, Choi's et al. (2011) results corroborate that EI self-reports offer a useful and economic way of predicting individual outcomes without major concerns for socially desirable responding. Finally, in line with our proposed integrative framework for conceptualizing EI presented in Chapter 3, the trait level is closer to the competencies level, i.e., the behavioural tendencies are more indicative of what people actually do than their abilities or knowledge, as pointed by Mikolajczak (2009).

Therefore, we focused our analysis on the self-report measures specifically built to measure EI at the individual level and available in the scientific literature for research purposes. Table 11 displays a comparative analysis of four of the major open-access questionnaires: the SEIS (Schutte et al., 1998); the SREIS (Brackett et al., 2006), the TEIQue-SF (Petrides, 2009) and the WLEIS (Wong & Law, 2002).

As shown, the measure that seems closer to the five components that we intend to measure is the SEIS. However, as we have seen in the previous chapter, this questionnaire suffers from a number of limitations that must be taken into consideration. First, its factor structure is still unsettled and the four factors depicted in Table 11 are only one possibility among others, though one of the most widely used (Schutte et al., 2009). While it was developed to portray the original Salovey and Mayer's (1990) model, subsequent factor analyses failed to reproduce the basic factor structure (e.g., Gignac et al., 2005; Ng et al., 2010).

Second, the sub-scale of appraisal of emotions is often represented by only one factor, i.e., it does not always emerge split into self and other domains (Ciarrochi et al., 2002; Petrides & Furnham, 2000; Saklofske et al., 2003). Third, issues regarding reliability have been raised about the emotion sub-scale (e.g., Ciarrochi et al., 2002). Finally, this questionnaire is highly correlated with measures of alexithymia and psychological well-being (r = -.65 and r = .69, respectively). Also, psychological well-being explained 70% of the variance of the SEIS and exploratory factor analysis revealed that the SEIS and all psychological well-being sub-scales factored together (Brackett & Mayer, 2003).

Table 11. *Comparative Analyses of the Main Open-Access Self-Report Measures of EI*

	SEIS	SREIS	TEIQue	WLEIS
Intrapersonal				
Perception	Appraisal of emotions		Emotion perception	Self-emotions appraisal
Regulation	Optimism/ Mood regulation	Managing emotion (self)	Self-control	Regulation of emotion
Utilisation	Utilisation of emotions	Use of emotion		Use of emotion
Understanding		Understanding emotion		
Miscellaneous			Well-being Adaptability Self-motivation Emotion expression	
Interpersonal				
Perception	Appraisal of emotions	Perceiving emotion	Emotion perception	Others-emotions appraisal
Regulation	Social skills	Social management	Emotion management (others)	
Miscellaneous			Assertiveness Empathy Emotional expression Relationship skills Social competence	

Note. SEIS - Schutte Emotional Intelligence Scale; SREIS - Self-Rated Emotional Intelligence Scale (Brackett et al., 2006); TEIQue-SF - Trait Emotional Intelligence Questionnaire-Short Form; WLEIS - Wong and Law Emotional Intelligence Scale.

3.2.2 Revisiting the SEIS (Study 1)

In spite of the limitations previously identified we conducted a study to test whether the SEIS would still be a valid measure to operationalize our proposed Core Components model of EI, given its widespread acceptance. This study includes both a qualitative (content validity) and a quantitative analysis (confirmatory factor analysis) which we will present subsequently.

3.2.2.1 Method

Sample and procedure

The sample consisted of 212 university undergraduate and postgraduate students from Psychology (35%), Human resources (23%), Health and safety (18%), Management (8%) and others (16%). The majority of the participants were female (64%), were already graduated (67%) and were employed (77%). Ages ranged from 18 to 51 years and the mean age was 31.6 years (SD = 8.1).

Participants were sent an e-mail with a memo explaining the study purposes and inviting them to answer an online survey. Those who couldn't access the link or that preferred the classical paper and pencil version were sent a hard copy, which they returned by pre-paid post.

Instrument

The SEIS - Schutte Emotional Intelligence Scale - is a 33 item self-report questionnaire developed by Schutte et al. (1998) based on Salovey and Mayer's (1990) original model of Emotional Intelligence, already described in Chapter 2. The complete list of items is shown in Appendices A (English) and B (Portuguese). Respondents were requested to rate themselves on a 6-point Likert scale ranging from 1(*strongly disagree*) to 6 (*strongly agree*).

3.2.2.2 Results

This study includes both a qualitative and a quantitative analysis. Before testing the suitability of the SEIS to operationalize our proposed model of EI we analysed the content of this instrument in order to classify the items into the five categories that the model includes: perception and regulation of emotions in self (intrapersonal EI), perception and regulation of emotions in others (interpersonal EI) and mobilization of emotions. Then we compared our classification with that of previous studies to assess the degree of agreement. After deciding which items would be more appropriate to measure each dimension we performed a confirmatory factor analysis to test the measurement model.

Content validity

Table 12 compares the results of our classification with those obtained in previous studies (Davies et al., 2010; Gignac et al., 2005) and the degree of agreement among them. As shown, 16 out of the 33 items (48.5%) gathered total consensus about what they seem to be measuring, for other 10 there was a match between our classification and that of Davies et al. (2010), and there were two more matches between our classification and that of Gignac et al. (2005). Finally, there were 17 matches (51.5%) between the studies by Gignac et al. (2005) and Davies et al. (2010).

However, some items received completely different interpretations from each study. For instance, we considered item 23: "I motivate myself by imagining a good outcome to tasks I take on" as strategically using emotions for a specific purpose (self-motivation is this case). In our view, in this item it is clear that the person creates a positive state of mind in order to accomplish his/her duties. In contrast, Gignac et al. (2005) viewed it as regulation of one's emotions and Davies et al. (2010) simply dismissed this item for lacking a clear emotional content. A similar situation happened with item 2: "When I am faced with obstacles, I remember times I faced similar obstacles and overcame them" and item 28 (reverse-coded): "When I am faced with a challenge, I give up because I believe I will fail".

Table 12: *Summary of the content validity analyses of the SEIS*

	Items		
Dimensions	Gignac et al. (2005)	Davies et al (2010)	Present study
1. Perceiving emotions in self	9, 22	*9*, 19, *22*	9, 19, 22
2. Regulating emotions in self	2, 3, 10, 12, 14, 23, 28, 31	11*, *12**, *14*, 21, 26*	12, 14, 21
3. Perceiving emotions in others	5, 15, 18, 25, 29, 32, 33	*18*, 26*, *29*, *32*, *33*	5, 18, 25, 26, 29, 32, 33
4. Regulating emotions in others	4, 13, 16, 24, 30	11*, *13*, *30*	30
5. Mobilization of emotions	7, 17, 20, 27	*7*, 12*, *17*, *20*, *27*, 31	2, 7, 17, 20, 23, 27, 28, 31
6. Expression of emotions	1, 11	*11**	11, 15
Uncategorized	6, 8, 19, 21, 26	1, 2, 3, 4, 5, *6*, *8*, 10, 15, 16, 23, 24, 25, 28	1, 3, 4, 6, 8, 10, 13, 16, 24

Note. Items' description is available in Appendices A (English) and B (Portuguese); * = item measures more than one dimension. *Italicized* items = match between the classification of Gignac et al. (2005) and Davies et al. (2010); Underlined items = match between our classification and that of Gignac et al. (2005); Bold items = match between our classification and that of Davies et al. (2010). Underlined and bold items = match between our classification and that of the other two studies.

Overall, it seems that our qualitative analysis is closer to that of Davies et al. (2010) with 26 out of 33 items (79%) categorized similarly. Nevertheless, the fact that only about half of the items of the SEIS received the same categorization among the three studies and that up to 14 items (42.4%) were not categorized is indicative of some lack of content validity. Moreover, Davies et al. (2010) considered 13 of the 14 uncategorized items as lacking explicit emotional content. For example, the assertion "I am aware of the non-verbal messages other people send" (item 25) does not specifically mention that the other person is expressing emotion. Adding to this, they also identified three items as measuring more than one dimension (see Table 12). For example, item 11: "I like to share my emotions with others" can be categorized as expression of emotions, but also as a form of self-regulation, and/or as a form of regulating other people's emotions. Nevertheless, the first option is the most intuitive.

That said we opted to exclude from further analysis the uncategorized items and those that showed a poor fit in a previous IRT analysis (items 5, 6, 28 and 33; Kim et al., 2010). Interestingly, all the negatively worded items are included in this group (5, 28 and 33). Therefore, it seems that these items are measuring something different than the positively worded ones.

Factorial validity

In order to evaluate de suitability of the remaining 21 items to measure our Core Components model of EI, we conducted a Confirmatory Factor Analysis using AMOS 17.0 software (Analysis of Moment Structures, Arbuckle, 2008). One of the main advantages of this technique is the ability to assess the construct validity of a proposed measurement theory, i.e., the degree to which the items accurately measure the theoretical latent construct (Hair, Black, Babin, & Anderson, 2010).

Following Schweizer's (2010) guidelines, model fit was evaluated considering the combination of different indicators: Chi-square (χ^2), normed χ^2 ($\chi2/DF$), Comparative Fit Index (CFI), Root Mean Square Error of Approximation (RMSEA) and Standardized Root Mean Square Residual (SRMR).

Chi-square is a test of absolute model fit and if the *p* value associated is non-significant, the model has good fit. A normed χ^2 bellow 2 usually suggests a good fit and below 3 an acceptable one (Bollen, 1989). However, the indexes based on χ^2 are sensitive to sample size and might wrongfully indicate model inadequacy even when it is adequate (Kline, 2005). Therefore we also used relative fit statistics to assess the overall fit a model has to the data,

such as CFI, RMSEA and SRMR. The model is generally considered good-fitting if CFI is above .95, if RMSEA is below .06 and if SRMR is less than .05 (Hu & Bentler, 1999).

Hair et al. (2010) not only recommend the use of multiple indices of differing types, but also to adjust the index cut-off values based on model characteristics, such as sample size and model complexity. For a sample larger than 250 respondents and with 12 to 30 indicators, a significant χ^2 is expected, CFI should be above .92, SRMR should be .08 or less and RMSEA should be below .07.

The estimation of the effects of the hypothesized relationships was performed using maximum likelihood method. Given that our content analysis only identified one item to measure regulation of emotions in others, we could not test that factor in the confirmatory factor analysis separately. The same happened with expression of emotions, for which we only identified two items and which was not confirmed in previous studies (e.g., Davies et al., 2010; Gignac et al., 2005). Therefore, we aggregated factors 1, 2 and 6 in one factor and tested a three-factor model with the main dimensions of the proposed Core Components model: intrapersonal EI (perceiving and regulating emotions in self), interpersonal EI (perceiving and regulating emotions in others) and mobilization of emotions. Results indicated poor fit (χ^2/df = 2.52, CFI = .81, RMSEA = .08 and SRMR = .08), with a significant χ^2, expected for a large sample (χ^2 = 469.2; df = 186; p = 0).

Moreover, as shown in *Figure 14*, there was a high correlation between intrapersonal EI and mobilization of emotions (.91) indicating very low discriminant validity, i.e., they were basically representing the same construct. Also, seven items had low loadings (< .50) including the only item that was measuring the factor "regulating emotions in others". In view of this we removed them and retested the model with the remaining 14 items. Although the fit improved (χ^2 = 188.4; df = 74; p = 0; χ^2/df = 2.55, CFI = .90, RMSEA = .09 and SRMR = .07), discriminant validity between Intrapersonal EI and mobilization of emotions was still very low, with both factors correlating at .87. Finally, Interpersonal EI only includes items measuring perception and expression of emotions in others, since the only item measuring the "regulating emotions in others" was removed due to its low loading on the factor.
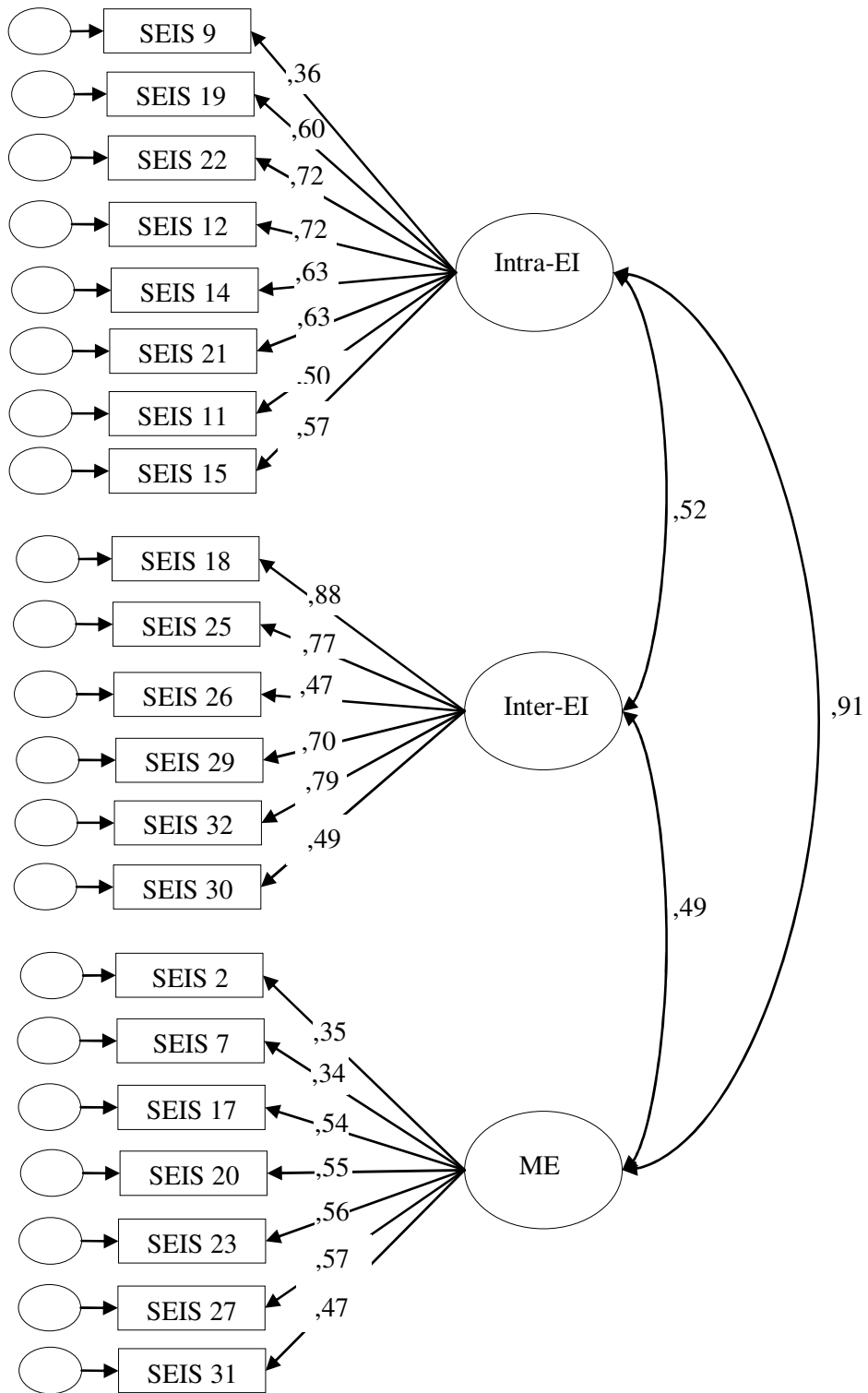
Figure 14. CFA of the Proposed Model of EI Based on the SEIS

3.2.2.3 Discussion

This study aimed to test whether the SEIS could be used to operationalize the proposed Core Components model of EI. After a content analysis of the 33 items we were able to categorize only 19 into the five domains that we intended to measure. However, the factor "regulating emotions in others" included just one item and we could only test a three-factor model with the key domains of our model: intrapersonal EI, interpersonal EI, and mobilization of emotions.

The results of the confirmatory factor analysis showed poor fit and discriminant validity problems between intrapersonal EI and mobilization of emotions. This difficulty remained even after removing the items with low loadings and improving model fit. Moreover, in the final version the interpersonal EI factor only included items measuring "perceiving emotions in others" as the only item measuring "regulating emotions in others" had a low loading. Therefore, we conclude that a new instrument should be created to assess the proposed major components of EI.

3.2.3 Proposing and Testing a New Measure (Study 2)

As a result of the limitations found in the instrument that seemed to be the best available candidate to test our Core components model of EI, we developed an alternative questionnaire. Building on the self-report measures presented in Table 11 we first analysed the items of these instruments and selected those that better reflected the dimensions we intend to measure. Secondly, we created new items to replace those that were less clear or that did not have an explicit emotional content, either related to the perception, regulation or utilization of emotions. Finally, we chose those that seemed to grant the best content validity for each factor.

3.2.3.1 Method

Sample

The total sample consisted of 591 members from a national police force, of which 88.3% were male. The majority of the participants were aged between 30 and 50 years (70.9%), 20.8% were younger than 30 and 5.4% were older than 50 (2.9% did not report their age). Regarding the level of education, most participants had completed 12 years (60.7%) or 9 years of schooling (24.8%), 6.7% studied less than 9 years and only 3.7% were graduated (4.2% did not report their educational level).

Instrument

EI was measured with a 29 item self-report instrument designed to operationalize the proposed model with five components: Perceiving Emotions in Self (PES), Perceiving Emotions in Others (PEO), Regulating Emotions in Self (RES), Regulating Emotions in Others (REO) and Mobilization of Emotions (ME). Sample items of each factor are: "It is usual for me to feel sad, happy or angry, without knowing why" (PES), "It is easy for me to read well the non-verbal messages that other people send" (PEO), "When someone upsets me I have difficulty in managing my feelings of rage" (RES), "I usually know what to do to cheer up someone who is feeling sad" (REO), "When I have something difficult to do, I usually imagine that everything is going to turn out well, so that I feel more confident" (ME). The complete list of items is shown in Appendices C (English) and D (Portuguese). Answers were based on a 6 point Likert scale from (1) *completely disagree* to (6) *completely agree*.

Procedure

The questionnaires were personally distributed by the supervisors in each unit, explaining that participation in the study was voluntary and anonymous. The completed surveys were deposited by the participants in sealed boxes, in order to guarantee confidentiality. The data from the 614 returned questionnaires was inserted in PASW 17.0 and analysed for *missings* and *outliers*. As there were some missing values (although below 5%) and since AMOS doesn't work with missing data, we used the correlations matrix as the input file in further analysis. Severe outliers were excluded from the database and therefore, the initial sample was reduced from 614 to 591 valid questionnaires. Inverted items were also recoded to assure uniformity in response trends.

Although a previous version with 55 items was pre-tested with another sample our preliminary analysis identified several items with low factor loadings (<.50), as well as 3 items with low face and content validity (Hair et al., 2010). Therefore, they were removed from subsequent analysis, and the initial pool of 29 items was reduced to 15.

3.2.3.2 Results

To evaluate the structural validity of our Core Components model of EI we performed a confirmatory factor analysis using AMOS 17.0 software (Arbuckle, 2008), as in the previous study and followed the same guidelines.

The estimation of the effects of the hypothesized relationships was performed using maximum likelihood method. The initial model with five first order factors (PES, PEO, RES, REO and ME) showed good fit (χ^2/df = 1.98, CFI = .95, RMSEA = .04 and SRMR = .04),

despite the significant χ^2, expected for a large sample ($\chi^2 = 215.4$; df = 109; *p* = 0). Nevertheless, correlations between Perception and Regulation factors in both Intra and Interpersonal domains indicated low discriminant validity (.88 and .87, respectively), i.e., they were basically representing the same construct. Taking this into consideration and the centrality of the self-other distinction proposed by Tett and colleagues, we further tested an aggregated three factor model (see *Figure 15*): Intrapersonal-EI (PES+RES), Interpersonal EI (PEO+REO) and Mobilization of emotions. Whereas the χ^2 value was significant ($\chi^2 = 182.6$; df = 87; *p* = 0), as expected for a large sample, the other indexes revealed good fit: χ^2/df = 2.1, CFI = .95, RMSEA = .04 and SRMR = .05.
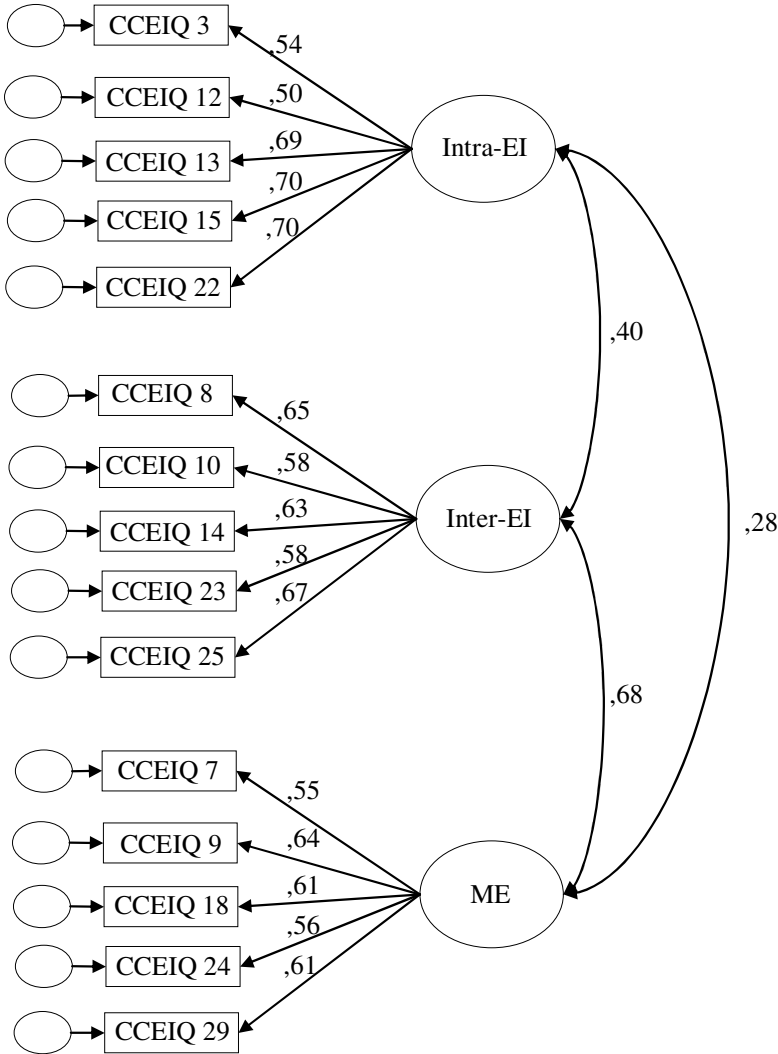
Figure 15. CFA of the Proposed Model of EI Based on a New Measure

Scales' internal consistency reliabilities were measured using construct reliability, also called composite reliability or rho (ρ). Although coefficient alpha is most frequently used, underestimation of true reliability is common (Hair et al., 2010). Our results indicate good reliability: Intra-EI ($\rho = .83$), Inter-EI ($\rho = .84$) and Mobilization of emotions ($\rho = .82$), since this indicator also ranges from zero to 1.0 and .70 or higher values are considered good (Hair et al., 2010). Finally, although this model fit is not significantly better than the five-factor model ($\Delta\chi^2 = 32.8$; $\Delta df = 22$; $p = .06$), discriminant validity improved (correlations ranged from .28 to .68). Therefore, we decided to adopt this parsimonious model.

To estimate the convergent validity of this instrument we also used AMOS to test its relationship with the SEIS. Results showed high correlations among the three core components of both measures: Intra-EI correlated with the SEIS intrapersonal component at .58, Inter-EI correlated with the SEIS interpersonal component at .78 and ME correlated with the SEIS mobilization of emotions component at .97 (after removing one item that was identical in our questionnaire). Therefore, we can conclude that these results indicate good convergent validity for our proposed measure of EI.

3.2.3.3 Discussion

This study aimed to test the proposed Core Components model of EI, which brings together two major existing frameworks from ability and trait perspectives – Mayer and Salovey's (1997) model and Goleman's (2001) model – regarding EI's main constituents. Although there are significant structural differences between these approaches, we analysed the conceptual overlaps and the possibility to reconcile them into a parsimonious model. At the methodological level, the problems associated with the existing instruments led us to recognize the need to create an alternative questionnaire to assess the proposed core dimensions suitable for research purposes, primarily, in organizational contexts.

Although the initial five factor model had good fit, there were discriminant validity problems regarding the perception and regulation of emotions in both the intra and interpersonal domains. Consequently, we tested an alternative model with three factors, by aggregating those that were highly correlated: Intrapersonal-EI (perception and regulation of emotions in self), Interpersonal-EI (perception and regulation of emotions in others), and Mobilization of Emotions (using emotions to sustain goal-directed behaviour). Support was also found for this model, with the advantage of being more parsimonious and showing better discriminability between the scales. Finally, we found good evidence of convergent validity with the SEIS, a well-known and widely used measure of EI.

We believe that this study brings a meaningful contribution to the field of EI, opening the way for the pursuit of a core structure of EI that can be used by different researchers. Moreover, it also supports the idea that Mobilization of Emotions is a key component of EI, opening a new window of investigation. Nevertheless, we are aware that it represents only a preliminary endeavour and that several limitations need to be addressed in future studies.

First, although our results are based on a large sample, the majority of the participants were male. Consequently, it is vital to test this model and measure with different and more gender balanced samples. Secondly, it is possible that the organizational culture in which participants are embedded influenced their responses, making it important to replicate these findings in other contexts and cultural environments, including in other countries.

Test-retest reliability is also an important matter to investigate in future studies in order to examine its consistency over time. Finally, it is also vital to investigate the predictive power of the proposed instrument, especially after controlling for possible concurrent predictors, such as personality. Although incremental validity is usually considered critical for measures of EI, we endorse Petrides and Furnham's (2003) view that this is a valuable construct, beyond its incremental utility. Thus, we hope that the proposed Core Components model and measure may offer a significant contribution to leverage further developments in this area, especially regarding EI's nomological network and the mechanisms linking it with other variables.

3.3 Challenge 3: The Added Value of EI

One of the most controversial aspects of EI is related to its potential overlap with existent and more established psychological constructs in the literature of individual differences, such as intelligence and personality. To express this concern critics have commonly used expressions like "reinventing the wheel" and "old wine in new bottles". In order to investigate whether EI represents something new, several researchers have attempted to provide evidence that this construct is not completely redundant with personality and cognitive ability, by analysing the strength of their relationships.

Regarding trait EI, Joseph and Newman (2010b) have recently found that the four EI facets of the WLEIS are distinguishable from the Big Five personality traits, although there were strong latent correlations (ranging from -.66 to .87) between all components of the WLEIS and three of the Big Five (Agreeableness, Conscientiousness, and Neuroticism). This possibly explains the small incremental validity usually obtained with self-reported EI. For

example Law et al. (2004) found only 5% to 6% of additional variance explained by the WLEIS in life satisfaction, after controlling for the Big Five.

As a possible explanation for the high association between both constructs, Joseph and Newman (2010b) suggested that EI could be functioning as a mediator that explains the effects of personality on behaviour and recommended future studies to investigate this possibility. This is in line with the trait EI conceptualization, which takes it as a lower-level personality construct, as proposed by Petrides and colleagues (e.g., Petrides, Pita & Kokkinaki, 2007). Using the TEIQue-SF, Petrides et al. (2010) have recently confirmed that trait EI's association with the Big Five exceeds 50%. According to the authors, this overlap is expected and supports trait EI theory, since EI traits have been shown to represent a distinct set of traits located at the lower levels of personality hierarchies. Moreover, Freudenthaler et al. (2008) found significant (although small) incremental validities for three self-report EI measures (TEIQue, TMMS and another measure designed by the authors). Among the trait EI measures, the TEIQue showed the best predictive power after entering the Big Five, explaining 6% to 8% additional variance in somatic complaints and life satisfaction, respectively.

Evidence of incremental validity beyond personality for other measures has also been reported. For example, Gardner and Qualter (2010) analysed the concurrent and incremental validity of three trait EI measures (SEIS, MEIA and TEIQue) and all showed modest degrees of unique variance (ranging from 2% to 17%) in the explanation of several criteria variables (aggression, loneliness, eating disorders, alcoholism, happiness, and life satisfaction), beyond the Big Five. Results depended not only on the measure used, but also on the global versus subscale usage and on the criterion variable.

As a consequence of these findings and following the conceptualization of trait EI as a lower-order personality construct, researchers have recently started to investigate integrated models that take EI as an explanatory mechanism. The focus is starting to change from the analysis of the incremental validity of EI to the investigation of its role in the processes that link higher-order personality traits to their outcomes. Shifting from the examination of direct isolated relationships to the test of mediated models has allowed for a much richer insight into the combined effects of these different traits on criteria variables. For example, both Greven, Chamorro-Premuzic, Arteche, and Furnham (2008) and Johnson, Batey, and Holdsworth, (2009) found that trait EI fully mediated the paths between personality and health, except for neuroticism, which still had a significant direct effect on health.

In sum, although incremental validity is usually considered critical, Petrides and Furnham (2003) argued that EI is a valuable construct, beyond its incremental utility both at the conceptual and explanatory level. Also, Gignac, Jang, and Bates (2009) used the term "incremental coherence" to express the idea that trait EI is a valuable and useful scientific construct, independently of its incremental power over personality (even in the total absence of any unique validity), because it is associated with clearer construct boundaries. These authors argued that incremental validity is just a statistical criterion and should not be the only basis to evaluate the value of a construct. They state that trait EI models are substantially narrower than personality models, because they are focused on emotions.

Regarding ability EI, the findings are somewhat similar to self-reported EI. For example, MacCann (2010) found high correlations between two new ability measures of EI (STEU and STEM) and crystallized intelligence (r = .71), although ability EI formed a distinct latent factor from fluid intelligence and crystallized intelligence. Also, both tests had similar relationships with personality, showing only significant correlations with Openness to experience. Although these results raise some doubts about the distinctiveness of ability EI from crystallized intelligence, sex differences showed opposite patterns: women scored higher in EI and men scored higher in crystallized intelligence. According to the author, this difference indicates that emotional knowledge is distinct from other kinds of knowledge.

A study by Rode et al. (2008), based on two samples, found evidence supporting discriminant validity for the MSCEIT relative to personality. Although the overall EI factor was significantly related to conscientiousness, (.12), agreeableness (.14), and neuroticism (−.15), as well as to impression management (.35), the correlations were weak to moderate. Nevertheless, after controlling for the effects of general mental ability, long term affect, and personality, the overall ability EI score did not predict incremental variance in either academic performance or life satisfaction in both samples. In contrast, a study by Fiori and Antonakis (2011) found that both general intelligence and personality predicted a significant amount of variance in MSCEIT sub-scales (with R^2 values ranging from .24 to .58). Moreover, the Big Five were significantly predictive of the branches even after adding general intelligence, with agreeableness having particularly high effects on branches 2 and 4. This means that the MSCEIT is accounted for not only by cognitive ability, but also by personality.

A recent meta-analysis by Joseph and Newman (2010a) found that EI is a better predictor of job performance in high emotional labour jobs. This was true for both performance and trait measures of EI, however, trait measures were stronger predictors, even

in the presence of personality and cognitive ability. Their incremental power over the Big Five was 17.5%, while performance measures showed only an added value of 1.5%. Regarding cognitive ability, the pattern was similar, with performance measures of EI showing only 0.7% of incremental validity and self-report measures showing 14.9%. In the middle of these two were the self-reports used to measure ability models (e.g., SEIS, WLEIS), which the authors wanted to distinguish from the other (mixed) self-report measures of EI, based on broader models. These "hybrid" measures had lower incremental validity than the other self-reports (1.7% and 4.8%, respectively), probably because they measure EI less comprehensively, reducing their predictive power. Finally, only the two kinds of self-report measures showed incremental validity over and above both Big Five personality traits and cognitive ability (self-reported "ability EI" with 2.3% and self-reported "mixed EI" with 14.2%). Nevertheless, when they examined the incremental validity for jobs with high emotional labour demands, all three types of EI measures showed incremental validity over and above both personality and cognitive ability.

Another meta-analysis by O'Boyle, Humphrey, Pollack, Hawver, and Story (2010) generally supported these findings. Although all three streams of EI predicted job performance at about equivalent levels, after controlling for the Big Five and cognitive ability, only the self-reported EI measures (both based on ability and mixed models) added significant incremental variance (5.2% and 6.8%, respectively). Also, the results of a relative dominance analyses showed that only 6.4% of the explained variance in job performance was attributable to performance measures of EI, while self-reported EI explained about 13%. The remaining variance in job performance was explained by cognitive ability and conscientiousness.

In a recent study with 499 adolescents, Davis and Humphrey (2012) have also found that EI predicts mental health beyond personality and cognitive ability. Both ability and trait EI showed incremental validity in the prediction of depression and disruptive behaviours, although it was stronger for trait EI: ability EI (MSCEIT-YV) displayed additional explained variances of 1.2% with both criteria, while trait EI (TEIQue-ASF) displayed additional explained variances of 1.8% and 8%, respectively.

Overall, the evidence presented in this section supports the added value of both forms of EI over and above personality and cognitive ability, in such diverse areas as health, life satisfaction and performance. Therefore, these findings defy the suggestion that the traditional psychological variables explain sufficient variance and that new predictors, such as EI are "old wine in new bottles".

Summary and conclusions

This chapter builds a case to sustain that two research streams have emerged depending on the way EI is measured. These options lead to differing results and originated much confusion in the field, creating, at least, three major challenges that need to be addressed. The first is to bring EI approaches together, the second is to find the core structure of this construct and the third is to test its added value in the face of the existing psychological constructs.

In an attempt to address the first challenge, of a more theoretical nature, we have anticipated a possible integrative framework that builds on previous efforts in this direction. More specifically, we proposed a multi-layer model of EI that includes several levels from traits (non-observable) to competencies (observable behaviours). Each layer refers to a different aspect of the EI phenomenon and presupposes different assessment methods. Therefore, conclusions drawn at one level should not be transposed to other levels. Moreover, they have different degrees of malleability that should be taken into account when targeting training efforts.

Regarding the quest for the core structure of EI we started by comparing models representative of the two main traditions in order to find a common ground. This allowed us to propose a Core Components model of EI comprising three major components: intrapersonal, interpersonal, and mobilizations of emotions. Then we examined its validity based on a tailored instrument capable of capturing the intended structure, after revisiting the SEIS and finding it was not suitable for this specific purpose. On the basis of a Confirmatory Factor Analysis we found support for the proposed model.

In the next chapter, we will present and discuss EI's main implications for both individuals and organizations. Moreover, in studies 4 and 5 we will embrace the challenge of exploring the added value of EI from a nonlinear perspective, in an effort to expand previous findings regarding this issue.

Chapter 4 – Implications for Individuals

"(...) to say that EI (or any set of socioemotional predictors) 'matters' or 'is beneficial' is misleading, if not nonsensical, unless we know 'for what' it matters and 'why' it matters for that particular outcome".

Kaplan, Cortina, and Ruark (2010)

In the previous chapters we have focused on the emergence of EI, its diverse models and measures, and main research streams. We have also addressed two of the main challenges that we believe are important to undertake: to bring EI approaches together in a comprehensive model that integrates their different contributions and to identify the core structure of this construct. In line with Kaplan's et al. (2010) claim we will now focus on the analysis of EI's main implications and also address the challenge of testing EI's added value, based on a nonlinear perspective.

We will start by presenting our meta-analytic study performed with the relevant studies that linked EI with health outcomes and which was recently published (Martins et al., 2010). We believe this is a rather important outcome for both individuals and organizations, as well as for society, in general. The World Health Organization testifies its relevance defining health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (WHO, 2006). This definition was put forward in 1946, but only lately researchers have started to change their focus from illness and ill-being to wellness and well-being (Huppert, 2009).

Although a previous meta-analysis corroborated the relationship between EI and health (Schutte et al., 2007), we understood that an update was in need for three major reasons: (1) many studies became available after this meta-analysis was performed; (2) it only included studies published in English; and (3) a cumulative meta-analysis would add to the extant literature by checking for the sufficiency and stability of this relationship.

After presenting our meta-analytic study we will move from a correlational approach to the examination of causal paths between EI and two other important outcomes for individuals: academic performance and well-being. We will also include personality as an antecedent variable in our structural models not only to control for its influence, but also to examine the added value of EI as a mediator in the processes that link more distal predictors such as personality to the intended outcomes. Moreover, we will use our Core Components model of EI instead of the more generalized global score approach, to better capture the specific

relationships of EI's core components with the other variables. This part of the chapter represents an effort to move beyond the mere correlational or direct relationships' analysis and examine the role of EI as a mediator between personality and its outcomes. Finally, we will analyse these process models via nonlinear structural equations modelling as an attempt to capture more realistic relationships among the examined variables, and, therefore, extend previous findings from the more traditional linear research.

4.1 EI and Health: A Meta-Analysis (Study 3)

In this section we will present our meta-analytic study published in *Personality and Individual Differences* (Martins et al., 2010). It is possible that some of its content may slightly overlap with previous chapters of this thesis, especially in the introduction section, but we kept the original text for the sake of coherence and readability. We will also keep the paper's structure, except for the abstract which is not presented here and the references included in the meta-analysis, which will be presented in the end of this thesis.

4.1.1 Introduction

In everyday life, people have the notion that acknowledging and dealing effectively with emotions contributes to their well-being. On the other hand, ignoring them or not dealing with them properly can deteriorate their welfare, especially if it happens on a regular basis. For example, the perspective of an exam or an interview can make us feel anxious and if we are not able to find ways to deal with these emotions, we might end up feeling truly ill.

Being able to recognize what we and other people feel, and finding ways to deal with those emotions is an important facet of what psychologists generally call Emotional Intelligence (EI). After almost 20 years of research in the field of EI, doubts still exist about its conceptualization and relevance in different life domains. Considered either as a set of interrelated abilities (e.g., Mayer & Salovey, 1997) or as a constellation of emotional self-perceptions within the lower levels of personality hierarchies (Petrides, Pita & Kokkinaki, 2007), EI has received divergent operationalisations, either as a test of maximum performance (e.g., MSCEIT - *Mayer-Salovey-Caruso Emotional Intelligence Test*) or as a self-report questionnaire (e.g., TEIQue – *Trait Emotional Intelligence Questionnaire*), respectively. The lack of consensus endorsed the proliferation of many different instruments to measure this new construct, making it difficult to take confident conclusions about EI's real value and impact. One valuable way to put together disperse results from different studies is using meta-analysis, a rigorous quantitative approach which refers to the statistical integration of the

results of independent studies, leading to conclusions that are more precise and more reliable than can be derived in any one primary study or in a narrative review (Johnson, Mullen, & Salas, 1995; Rosenthal & Dimatteo, 2001).

Three important efforts have been made in this direction in EI's domain. Van Rooy and Viswesvaran (2004) used this approach to analyse EI's construct validity and Van Rooy, Viswesvaran and Pluta (2005) meta-analysed its predictive validity concerning performance. More recently, Schutte, Malouff, Thorsteinsson, Bhullar and Rooke (2007) also used this approach to examine the relationship between EI and health, an area that had not received specific attention in the previous meta-analytic studies. Their undertaking showed that higher EI is linked with better health. However, since then, more studies have been published that would be includable in the analysis of this relationship, as well as non-English studies (e.g., Spanish), available both before and after their work. This has the advantage of increasing the sample size and, therefore, the statistical power of the meta-analysis, besides doing justice to those studies (Johnson, Scott-Sheldon, Snyder, Noar, & Huedo-Medina, 2008). Furthermore, to our knowledge, a cumulative meta-analysis has not yet been performed in this area. Mullen, Muellerleile, and Bryant (2001) defined *cumulative meta-analysis* as "the procedure of performing a (new) meta-analysis at every point during the history of a research domain" (p. 1451). This procedure addresses the questions of sufficiency and stability in a specific area. The first one indicates whether a certain phenomenon is already established or needs additional studies and the second one indicates whether new studies would change the existing findings. This would give researchers the notion that more investigation is required in order to test the relationship between EI and health.

In summary, the purpose of this paper is to expand the findings of Schutte et al.'s (2007) work in three ways: (1) by including studies published after their meta-analysis; (2) by including non-English studies that became available both before and after their meta-analysis; and (3) by performing a cumulative meta-analysis.

4.1.2 Method

Since there are two methods to measure EI (ability-based vs. personality-like trait) and so many different instruments, especially in the last case, it is important to investigate their relative value as a health predictor. Therefore, two separate meta-analyses were conducted: one considering the two methods as different tasks (ability vs. trait) and another considering the specific instrument used as different tasks (e.g., EQ-i).

In order to compare the results with those found by Schutte et al. (2007), health was also categorized in three types (physical, psychosomatic, and mental), using the same criteria. Studies that used measures related to mental disorders (e.g., depression) were integrated in the mental health category, those that assessed physical (medical) symptoms were classified as physical health (e.g., bodily pain) and studies that mixed both kinds of indicators were classified in the psychosomatic category (e.g., general health measures). Therefore, three separate meta-analyses were conducted to assess the relationship between EI and each health category.

When analysing the studies, whenever multiple measures for the same variable were used (e.g., a measure of depression and a measure of anxiety to assess mental health; or two different trait questionnaires to measure EI) effect sizes were averaged to avoid biasing the results by deriving too many effect-sizes from the same sample. However, when there was an ability test and a trait questionnaire to measure EI in the same study, only one of the effect-sizes was considered in order to avoid mixing both constructs. The criterion used here consisted in selecting the operationalisation that was more difficult to find in the literature (i.e., ability measures) in order to guarantee a more balanced pool of results to analyse.

Meta-analytic Procedures

This meta-analysis is based on Rosenthal and Rubin's (1986) techniques, one of the approaches recommended by Johnson et al. (1995). Briefly, the procedure entails converting study outcomes to standard normal metrics (Zs associated with one-tailed probabilities for significance levels and Fisher's r-to-Z transformation for effect sizes), combining them to produce weighted means and examining them in diffuse and focused comparisons. Also, this approach provides a fail-safe number, which estimates the number of unretrieved studies and that were probably left in the file drawer, because they did not show significant results (p > .05) and which could threaten the overall conclusions. In other words, it gives an approximation of the findings' resistance to the *file drawer problem* (Rosenthal & Dimatteo, 2001b). Without this procedure it would lead to an overestimate of the number of significant results.

Literature search

Using all the standard literature search techniques, an exhaustive search was conducted for studies examining the link between emotional intelligence and health. Specifically *ABI/INFORM Global, Academic Search Complete, Business Source Complete, Economia Y Negocios, ERIC, Fuente Académica, Medline, Academic Search Alumni Edition, Business Source Alumni Edition, PsychArticles, and Google Scholar*, were searched using the

following keywords individually and combined, in English, Portuguese, Spanish and French: *emotional intelligence, health, depression, anxiety, burnout* and *personality disorders*. These computer searches were supplemented by ancestry searches (scrutinizing the reference sections of relevant studies that have already been retrieved to locate earlier relevant studies) and descendency searches (scrutinizing Social Science Citation Index to retrieve subsequent relevant studies that have cited earlier relevant studies), and browsing through the past 19 years of social psychology journals.

Studies were included if they met the following criteria: (1) Studies that reported, or allowed the precise reconstruction of a precise statistical test of the link between EI and Health. Therefore, studies that simply reported that a non-significant or significant effect was found, without providing the statistical test, data with which the statistical test could be reconstructed or a precise probability value were excluded. (2) Studies that used adult or adolescent participants (11 years and above). (3) Studies that reported using at least one of the three relevant dependent measures (i.e., mental health, physical health or psychosomatic health). (4) Studies that used predictors specifically referred to as EI tests, precluding those that used other, although related constructs (e.g., social intelligence). (5) Studies that measured at least three or four dimensions of EI (even when using short versions). Therefore, studies that simply used one or two subscales of a complete measure of EI were not included (e.g., studies that simply measured *Emotional Perception* or *Emotional Management*).

As a result, the new literature search produced a total of 46 includable additional reports available as of January 2010, resulting in further $k = 63$ hypothesis tests for the relationship between EI and health. Adding these to the studies included in the original research (Schutte et al, 2007) - 35 studies, 44 effect sizes, 7898 participants - we assembled a total of 80 studies and 105 hypothesis tests, in the present paper. The total sample included 19.815 participants, with reported mean ages between 15 and 53 years. It should be noticed that for the sake of coherence regarding our inclusion criteria, one study integrated in the original meta-analysis was excluded from the present one. Specifically, the Humpel, Caputi, and Martin (2001) study was not considered here, because only one scale (Perception of emotions) of a complete measure of EI was used.

Also, in line with the original meta-analysis, three predictors were derived for each hypothesis test: gender was operationalised as either male (1), female (2) or both (0); age group was operationalised as adults (1), adolescents (2) or both (0); finally, participants' origin was operationalised as either students (1), community (2) or both (0). Based on Schutte et al.'s (2007) results, it is expected that the magnitude of the relationship between EI and

health will vary as a function of gender, but not as a function of age group and participants' profile (see Table 13) for the hypotheses tests included in this meta-analysis, along with the relevant statistical information).

4.1.3 Results

Hypothesis tests for the ability and trait tasks were separately subjected to the following meta-analytic procedures: combination of significance levels, and the combination and diffuse comparison of effect sizes (for more details please refer to Rosenthal & Rubin, 1986). The same was done for the diverse trait tasks, that were used more often: TMMS[*] (Trait Meta Mood Scale; Salovey, Mayer, Goldman, Turvey & Palfai, 1995), SEIS (Schutte Emotional Intelligence Scale; Schutte et al., 1998), EQ-i (Emotional Quotient Inventory; Bar-on, 1997), and TEIQue (Trait Emotional Intelligence Questionnaire; Petrides, Pérez-González & Furnham, 2007), representing the different tests used to measure EI as a trait. The same meta-analytic procedures were applied for health in general and for the three types of health, in order to analyse their specific relationships with EI.

Ability Task

Results of Combinations of Significance Levels and Effect Sizes

Effect sizes and significance levels. For the $k = 11$ hypothesis tests presented in Table 13, the EI effect was small ($\bar{r} = .172$, $\bar{Z}$Fisher $= 0.174$) but significant ($Z = 9.009$, $p = 4.690525e\text{-}018$) for the ability task.

Fail-safe number. For the present meta-analysis, the fail-safe number of 317 exceeds the threshold of 5(11+10) = 105. Therefore, it seems unlikely that the results reported above were adversely affected by publication bias.

Results of the Focused Comparisons of the Predictor Variables. For the ability task, none of the predictor variables hypothesized to moderate the relationship between EI and Health, was significant (see Table 15).

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[*] Although the TMMS contains three scales that are usually not combined, they were averaged to obtain a global index for the purpose of this study, as there is precedence for this procedure (Schutte et al., 2007).

Trait Task

Results of Combinations of Significance Levels and Effect Sizes

Effect sizes and significance levels. For the k = 72 hypothesis tests presented in Table 13, the EI effect was moderate ($\bar{r}$ = .341, $\bar{Z}$Fisher = 0.356) and significant (Z = 41.451, p = 1,828692E-73) for the trait task.

Fail-safe number. For the present meta-analysis, the fail-safe number of 49182 well exceeds the threshold of 5(72+10) = 410. Therefore, it seems unlikely that the results reported above were adversely affected by publication bias.

Results of the Focused Comparisons of the Predictor Variables. There was only one significant effect of participants characteristics in the trait task - Gender (Z = 3.223, p = .001) (see Table 15). Therefore, female participants had higher EI in the trait task than male participants.

TMMS Task

Results of Combinations of Significance Levels and Effect Sizes

Effect sizes and significance levels. For the k = 25 hypothesis tests presented in Table 13, the EI effect was moderate ($\bar{r}$ = .242, $\bar{Z}$Fisher = 0.247) and significant (Z = 17.060, p = 7.68916E-39) for the TMMS task.

Fail-safe number. For the present meta-analysis, the fail-safe number of 2690 well exceeds the threshold of 5(25+10) = 175. Therefore, it seems unlikely that the results reported above were adversely affected by publication bias.

Results of the Focused Comparisons of the Predictor Variables. For the TMMS task none of the predictor variables hypothesized to moderate the relationship between EI and Health, was significant.

SEIS Task

Results of Combinations of Significance Levels and Effect Sizes

Effect sizes and significance levels. For the k = 13 hypothesis tests presented in Table 13, the EI effect was moderate ($\bar{r}$ = .286, $\bar{Z}$Fisher = 0.294) and significant (Z = 13.052, p = 2,471925E-29) for the SEIS task.

Fail-safe number. For the present meta-analysis, the fail-safe number of 1008 well exceeds the threshold of 5(13+10) = 115. Therefore, it seems unlikely that the results reported above were adversely affected by publication bias.

Results of the Focused Comparisons of the Predictor Variables. There was only one significant effect of participants' characteristics in the SEIS task - Gender (Z = 2.550, p =

.005). Therefore, female participants had higher EI in the SEIS task than male participants (see Table 15).

EQ-i Task

Results of Combinations of Significance Levels and Effect Sizes

Effect sizes and significance levels. For the $k = 10$ hypothesis tests presented in Table 13, the EI effect was moderate ($\bar{r} = .444$, $\bar{Z}$Fisher $= 0.477$) and significant ($Z = 21.233$, $p = 4,484285E-47$) for the EQ-i task.

Fail-safe number. For the present meta-analysis, the fail-safe number of 1790 well exceeds the threshold of 5(10+10) = 100. Therefore, it seems unlikely that the results reported above were adversely affected by publication bias.

Results of the Focused Comparisons of the Predictor Variables. There was only one significant effect of participants' characteristics in the EQ-i task - Gender. ($Z = 2.228$, $p = .01$). Therefore, female participants had higher EI in the EQ-i task than male participants (see Table 15).

TEIQue Task

Results of Combinations of Significance Levels and Effect Sizes

Effect sizes and significance levels. For the $k = 12$ hypothesis tests presented in Table 13, the EI effect was moderate ($\bar{r} = .505$, $\bar{Z}$Fisher $= 0.556$) and significant ($Z = 27.817$, $p = 1,425827E-57$) for the TEIQue task.

Fail-safe number. For the present meta-analysis, the fail-safe number of 3553 well exceeds the threshold of 5(12+10) = 110. Therefore, it seems unlikely that the results reported above were adversely affected by publication bias.

Results of the Focused Comparisons of the Predictor Variables. For the TEIQue task none of the predictor variables hypothesized to moderate the relationship between EI and Health, was significant.

Health Indicators

Regarding the different health indicators, results were also analysed as a function of the three categories considered: mental, psychosomatic and physical. Since only mental health studies included ability measures, the comparison between these 3 categories regards just the trait tasks. As shown in Table 14, mental health showed a stronger association with EI ($\bar{r} = .36$), followed by psychosomatic health ($\bar{r} = .33$) and physical health ($\bar{r} = .27$). In all cases the failsafe number exceeded the threshold. Therefore, it seems unlikely that these results were adversely affected by publication bias.

Examining the specific measures of the trait approach, Table 14 also shows that the TEIQue and EQ-i have the strongest association with mental health ($\bar{r} = .53$ and $\bar{r} = .44$, respectively). Since all the failsafe numbers exceeded the thresholds, it seems unlikely that these results were adversely affected by publication bias. Regarding the other two types of health, there aren't enough studies within each specific kind of measure, to allow for this sort of comparison.

Table 13. *Studies Included in the Meta-analysis linking EI with Health*

Study	Task[b]	Statistic	n	$\bar{Z}$ Fisher	Z	p	Gender[g]	Age[h]	Origin[i]
				Mental health					
Ali et al. (2009)	TEIQue[c]	r = .37	84	.39	3.49	2.46E-004	0	1	1
Augusto-Landa et al. (2006)	TMMS[c]	r = .21	180	.21	2.84	.002	0	1	2
Austin et al. (2004)[a]	SEIS[d]	r = .19	115	.19	2.04	.002	0	1	0
Bastian et al. (2005)[a]	ABILITY	r = .24	246	.24	3.80	7.00E-005	0	0	1
Bauld & Brown (2009)	SEIS	r = .51	116	.56	5.87	2.61E-009	2	1	2
Brackett & Mayer (2003)[a]	ABILITY	r = .04	188	.04	0.55	.29	0	1	1
Brackett et al. (2004)[a]	ABILITY	r = .11	330	.11	2.00	.02	0	0	1
Brown & Schutte (2006)[a]	SEIS	r = .37	167	.39	4.94	4.15E-007	0	1	1
Ciarrochi et al. (2001)[a]	SEIS	r = .43	131	.46	5.15	1.42E-007	0	2	1
Ciarrochi et al. (2002)[a]	SEIS	r = .23	302	.34	4.04	2.67E-005	0	1	1
Curbelo et al. (2006)	TMMS[c]	r = .10	135	.10	1.16	.12	0	1	2
Dawda & Hart (Men) (2000)[a]	EQ-i	r = .57	118	.65	6.77	1.21E-011	1	0	1
Dawda & Hart (Women) (2000)[a]	EQ-i	r = .62	124	.73	7.71	2.77E-014	2	0	1
Day et al. (2005)[a]	EQ-i	r = .42	115	.45	4.70	1.38E-006	0	1	1
Donaldson-Feilder & Bond (2004)[a]	TMMS[c]	r = .16	290	.15	2.74	.003	0	1	2

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Study	Task[b]	Statistic	n	$\bar{Z}$ Fisher	Z	p	Gender[g]	Age[h]	Origin[i]
Dulewicz et al. (2003)[a]	EIQ	r = .46	59	.50	3.70	1.09E-004	0	1	2
Duran et al. (2006)	TMMS[c]	r = .22	373	.22	4.29	8.89E-006	0	1	1
Extremera & Fernandez-Berrocal (2002)[a]	TMMS	r = .23	99	.23	2.30	.011	2	1	1
Extremera & Fernandez-Berrocal (2005)[a]	TMMS[c]	r = .17	161	.17	2.16	.015	0	1	1
Extremera & Fernandez-Berrocal (2006)	TMMS[c]	r = .28	169	.29	3.70	1.09E-004	0	1	1
Extremera et al (2003)	TMMS	r = .23	183	.23	3,14	8.42E-004	0	1	2
Extremera et al (2006)	ABILITY	r = .13	625	.13	3.26	5.57E-004	0	0	1
Fernandez-Berrocal et al. (2004)[a]	TMMS[c]	r = . 23	292	.23	3.97	3.55E-005	0	1	1
Fernandez-Berrocal et al (2005)	TMMS[c]	r = .28	278	.29	4.75	1.04E-006	0	1	1
Fernandez-Berrocal et al (2006)	TMMS	r = .29	250	.30	4.67	1.52E-006	0	2	1
Fleming & Snell (2008)	MIXED	r = . 20	87	.20	1.87	.031	0	1	1
Fritson et al. (2007)	EQ-i[c]	r = .38	32	.40	2.18	.015	0	1	1
Gardner & Qualter (2009)	ABILITY	r = .26	523	.27	6.04	9.78E-010	0	1	0
Ghorbani et al. (2002)[a]	TMMS[c]	r = .32	451	.33	6.97	3.36E-012	0	1	1
Gohm et al. (2005)[a]	ABILITY	r = . 08	158	.08	1.00	.158	0	1	1
Goldenberg et al. (2006)[a]	ABILITY	r = . 14	223	.14	2.09	.018	0	1	2
Goldman et al. (1996)[a]	TMMS	r = .15	134	.15	1.74	.041	0	1	1

Study	Task[b]	Statistic	n	$\bar{Z}$ Fisher	Z	p	Gender[g]	Age[h]	Origin[i]
Grisham et al. (2008)	SEIS	r = .27	60	.28	2.10	.018	0	1	2
Hemmati et al. (2004)[a]	EQ-i	r = .57	119	.65	6.79	1.01E-011	1	1	2
Hervas & Vazquez (2006)	TMMS[c]	r = .28	243	.29	4.44	4.55E-006	0	1	1
Jain & Sinha (2005)[a]	EQ-i	r = .25	250	.26	4.00	3.12E-005	1	1	2
Johnson & Spector (2007)	WLEIS	r = .24	176	.24	3.22	6.47E-004	0	0	2
Jorge et al. (2008)	TMMS[c]	r = .33	50	.34	2.36	.009	0	2	1
Kaur et al. (2006)	SEIS	r =.46	117	.50	5.24	8.62E-008	0	1	2
Kee et al. (2009)	ABILITY	r =.33	50	.34	2.36	.009	0	1	2
Kemp et al. (2005)	BRIEF	r =.18	257	.18	2.90	.002	0	1	2
Leible & Snell (2004)[a]	MIXED	r = .22	1359	.22	8.21	1.02E-015	0	1	1
Limonero et al. (2006)	TMMS[c]	r =.19	25	.19	.93	.176	0	1	1
Martinez-Pons (1997)[a]	TMMS	r = .64	108	.76	7.49	1.16E-013	0	1	2
Martinez-Pons (1999)[a]	EISRS	r = .36	100	.38	3.70	1.09E-004	0	1	2
Mathews et al. (2006)	ABILITY	r =.20	200	.20	2.85	.002	0	1	1
Mavroveli et al. (2007)	TEIQue[c]	r = .60	282	.69	11.19	2.61E-024	0	2	1
Mikolajczak et al. (Study 1) (2006)	TEIQue[c]	r = .76	80	.10	8.23	9.04E-0016	0	1	1
Mikolajczak et al. (Study 2) (2006)	TEIQue[c]	r = .67	75	.81	6.62	3.03E-0011	0	1	1

Study	Task[b]	Statistic	n	$\overline{Z}$ Fisher	Z	p	Gender[g]	Age[h]	Origin[i]
Mikolajczak et al. (2007)	TEIQue	r = .65	82	.78	6.65	2.51E-011	0	1	0
Mikolajczak, Petrides & Hurry (2009)	TEIQue[c]	r = .48	490	.52	11.31	1.19E-024	0	2	1
Montes-Berges & Augusto-Landa (2007)	TMMS[c]	r = .15	119	.15	1.64	.051	0	1	1
Nikolaou & Tsaousis (2002)	EIQ	r = .59	212	.68	9.49	1.86E-019	0	1	2
Noguera & Diez (2006)	TMMS[c]	r = .29	144	.30	3.54	2.02E-004	0	1	2
Oginska-Bulik (2005)[a]	SEIS	r = .16	330	.16	2.92	.002	0	1	2
Parker et al. (2008)	EQ-I[c]	r = .28	667	.29	7.37	2.53E-013	0	2	2
Pau & Craucher (2003)[a]	SEIS	r = .29	213	.30	4.31	8.22E-006	0	1	1
Petrides et al. (Study 1) (2007)	EQ-i[e]	r = .53	166	.59	7.37	2.63E-013	0	1	1
Petrides et al. (Study 2) (2007)	TEIQue	r = .57	200	.65	8.83	1.55E-017	0	1	1
Petrides et al. (Study 3) (2007)	TEIQue	r = .40	212	.42	6.06	8.88E-010	0	1	1
Petrides, Pita & Kokkinaki (2007)	TEIQue	r = .47	274	.51	8.25	7.78E-016	0	2	1
Queirós et al. (2005)	TMMS[c]	r = .22	240	.22	3.44	2.91E-004	0	1	0
Repetto et al. (2006)	EII	r = .22	392	.22	4.40	5.44E-006	0	2	1
Riley & Schutte (2003)[a]	SEIS	r = .38	141	.40	4.66	1.58E-006	0	1	0
Rossen & Kranzler (2009)	ABILITY	r = .25	150	.26	3.10	9.81E-004	0	1	1
Saklofske et al. (2003)[a]	SEIS	r = .38	344	.40	7.31	3.79E-013	0	1	1

Study	Task[b]	Statistic	n	$\overline{Z}$ Fisher	Z	p	Gender[g]	Age[h]	Origin[i]
Saklofske et al. (2007)	SEIS	r = .04	356	.04	.75	.226	0	1	1
Salovey et al. (2002)[a]	TMMS	r = .26	104	.27	2.68	.004	0	0	1
Sanchez et al. (2006)	TMMS[c]	r = .17	146	.17	2.06	.020	0	1	2
Schmidt & Andrykowski (2004)[a]	TMMS[c]	r = .35	210	.37	5.22	9.60E-008	2	1	2
Schutte et al. (1998)[a]	SEIS	r = .37	37	.39	2.29	0.011	0	1	0
Shulman & Hemenover (2006)	MIXED	r = .32	225	.33	4.91	4.64E-007	0	1	1
Slaski & Cartwright (2002)[a]	EQ-i	r = .49	221	.54	7.76	1.94E-014	0	1	2
Summerfeldt et al. (2006)	EQ-i[c]	r = .54	667[f]	.60	15.15	1.60E-034	0	1	1
Trinidad & Johnson (2002)[a]	ABILITY	r = .19	205	.19	2.74	.003	0	2	1
Tsaousis & Nikolaou (Study 1) (2005)[a]	TEIQ	r = .43	365	.46	8.62	6.39E-017	0	1	0
Tsaousis & Nikolaou (Study 2) (2005)[a]	TEIQ	r = .29	212	.30	4.30	8.61E-006	0	1	2
Uva et al. (2010)	TEIQue	r =.44	36	.47	2.72	.003	0	1	2

Psychosomatic health

Study	Task[b]	Statistic	n	$\overline{Z}$ Fisher	Z	p	Gender[g]	Age[h]	Origin[i]
Augusto-Landa et al. (2006)	TMMS[c]	r =.18	180	.18	2.42	.008	0	1	2
Brown & Schutte (2006)[a]	SEIS	r = .36	167	.38	4.80	8.47E-007	0	1	1
Dawda & Hart (Men) (2000)[a]	EQ-i	r = .30	117	.31	3.30	4.83E-004	1	0	1

Study	Task[b]	Statistic	n	$\overline{Z}$ Fisher	Z	p	Gender[g]	Age[h]	Origin[i]
Dawda & Hart (Women) (2000)[a]	EQ-i	r = .32	122	.33	3.61	1.54E-004	2	0	1
Day et al. (2005)[a]	EQ-i	r = .42	115	.45	4.70	1.38E-006	0	1	1
Duran et al. (2006)	TMMS[c]	r = .22	373	.22	4.29	8.89E-006	0	1	1
Extremera & Fernandez-Berrocal (2006)	TMMS[c]	r = .14	169	.14	1.82	.034	0	1	1
Extremera & Fernandez-Berrocal (2002)[a]	TMMS	r = .20	99	.20	2.00	.023	2	1	1
Extremera et al (2003)	TMMS	r = .15	183	.15	2.03	.021	0	1	2
Greven et al. (2008)	TEIQue	r = .50	1038	.55	17.27	2.74E-039	0	1	1
Johnson et al. (2009)	TEIQue[c]	r = .50	328	.55	9.69	4.85E-020	0	1	1
Latorre & Montañes (2004)	TMMS[c]	r =.13	450	.13	2.76	.003	0	2	1
Mavroveli et al. (2007)	TEIQue	r = .40	282	.42	6.99	2.87E-012	0	2	1
Mikolajczak, Petrides & Hurry (2009)	TEIQue[c]	r = .31	490	.32	7.03	2.34E-012	0	2	1
Salovey et al. (2002)[a]	TMMS	r = .23	104	.23	2.36	.009	0	0	1
Shulman & Hemenover (2006)	MIXED	r = .22	225	.22	3.33	4.34E-004	0	1	1
				Physical health					
Austin et al. (2004)[a]	SEIS[d]	r = .03	117	.03	.32	.37	0	1	0
Bauld & Brown (2009)	SEIS	r = .54	116	.60	6.28	2.34E-010	2	1	2

Study	Task[b]	Statistic	n	$\bar{Z}$ Fisher	Z	p	Gender[g]	Age[h]	Origin[i]
Donaldson-Feilder & Bond (2004)[a]	TMMS[c]	r = .16	290	.15	2.74	.003	0	1	2
Extremera & Fernandez-Berrocal (2002)[a]	TMMS	r = .02	99	.02	.20	.42	2	1	1
Freudenthaler et al. (2008)	MIXED	r = .34	150	.35	4.27	9.81E-006	0	1	1
Goldman et al. (1996)[a]	TMMS	r = .15	134	.15	1.74	.041	0	1	1
Mikolajczak et al. (Study 1) (2006)	TEIQue	r = .46	80	.50	4.32	7.87E-006	0	1	1
Mikolajczak et al. (Study 2) (2006)	TEIQue	r = .58	75	.66	5.49	2.24E-008	0	1	1
Queirós et al. (2006)	TMMS[c]	r = .26	400	.27	5.28	6.93E-008	0	1	2
Saklofske et al. (2007)	SEIS	r = .13	356	.13	2.46	.007	0	1	1
Tsaousis & Nikolaou (Study 1) (2005)[a]	TEIQ	r = .32	365	.33	6.27	2.58E-010	0	1	0
Tsaousis & Nikolaou (Study 2) (2005)[a]	TEIQ	r = .44	212	.47	6.73	1.51E-011	0	1	2

[a] Studies included in the Schutte et al.'s (2007) meta-analysis.
[b] ABILITY=MSCEIT–Mayer, Salovey, Caruso Emotional Intelligence Test (Mayer, Salovey & Caruso, 2002) or MEIS–Multifactor Emotional Intelligence Scale; BRIEF=Brain Resource Inventory for Emotional intelligence Factors (Kemp et al., 2005); EII=Emotional Intelligence Inventory (Tapia, 2001); EIQ=Emotional Intelligence Questionnaire (Dulewicz, Higgs & Slaski, 2003); EISRS=Emotional Intelligence Self-Regulation Scale (Martinez-Pons, 1999-2000); EQ-i=Emotional Quotient Inventory (Bar-On, 1997); SEIS=Schutte Emotional Intelligence Scale (Schutte et al., 1998); TEIQ=Traits Emotional Intelligence Questionnaire (Tsaousis & Nikolaou, 2005); TEIQue=Trait Emotional Intelligence Questionnaire (Petrides, Pérez-González & Furnham, 2007); TMMS=Trait Meta Mood Scale (Salovey et al., 1995); WLEIS=Wong & Law Emotional Intelligence Scale (Law, Wong & Song, 2004).
[c] Short version; [d] Modified version of the SEIS (41 items); [e] Modified version of the EQ-i (15 additional items).
[f] Given that the sample size of this study (n=2629) was greater than the combined size of all the other EQ-i studies, we used the sample size equal to the next biggest study (viz., 667), to avoid biasing the results (Hunter & Schmidt, 2004).
[g] Male = 1, female = 2, both = 0.; h Adults = 1, adolescents = 2, both = 0.; i Students = 1, community = 2, both = 0.

Table 14. *Summary Statistics of the Meta-Analysis linking EI with Health*

Health Indicator	n	$\bar{r}$	$\bar{Z}$ Fisher	Z	p	Fail-safe No.
				Ability task		
Mental	11	.17	.17	9.01	4.69E-18	317
				Trait task		
Physical	12	.27	.28	12.40	1.24E-27	773
Mental	67	.36	.38	33.31	1.05E-64	39258
Psychosomatic	16	.33	.35	23.45	6.62E-51	2255
				TMMS task		
Mental	23	.25	.26	16.60	7.72E-38	2238
Psychosomatic	7	.17	.17	6.52	5.61E-11	109
				SEIS task		
Mental	13	.28	.29	12.62	3.38E-28	972
				EQ-i task		
Mental	10	.44	.48	21.23	4.48E-47	1790
				TEIQue task		
Mental	10	.53	.59	22.61	1.70E-49	1978

Note. For the physical and psychosomatic health indicators there were no studies available that used the ability task. Regarding the specific trait tasks, health indicators that had fewer than 5 studies with the same task were not included in the table.

Table 15. *Effect Sizes for the Predictor Variables Included in the Meta-analysis linking EI with Health*

Task	Gender[a]	Age[b]	Origin[c]
ABILITY	[d]	Z = .594 P = .276	Z = .231 P = .408
TRAIT	Z = 3.223 P = .001	Z = -1.392 P = .920	Z = -2.772 P = 1.115
TMMS	Z = .785 P = .216	Z = -.007 P = .503	Z = 1.290 P = .099
SEIS	Z = 2.550 P = .005	Z = 1.481 P = .069	Z = .636 P = .262
EQ-i	Z = 2.228 P = .01	Z = -4.515 P = 4.325	Z = -2.521 P = 1.061
TEIQue	[d]	Z = -.1743 P = .966	Z = -1.498 P = .094

[a] Male = 1, female = 2
[b] Adults = 1, adolescents = 2
[c] Students = 1, community = 2
[d] Insufficient number of studies.

Cumulative Meta-analysis

To perform a cumulative meta-analysis a separate meta-analysis is conducted each time a new study is added ("wave") to the meta-analytic database in order to answer the questions of sufficiency and stability (Mullen, Muellerleile, & Bryant, 2001b). Two different indicators were proposed by Mullen et al. (2001) to address these issues: the failsafe ratio and the cumulative slope, respectively.

Sufficiency has been obtained if the failsafe ratio exceeds Rosenthal's threshold at 1.000, i.e., when the failsafe number consistently exceeds the $5k + 10$ benchmark, indicating that there is no need for additional research to establish the phenomenon (Mullen et al., 2001). Therefore, *Figure 16* and *Figure 17* indicate that the EI paradigm has reached sufficiency across both ability and trait tasks. Specifically, as seen in *Figure 16*, the ability task reached sufficiency by the first wave in 2002 after one hypothesis test. And, as seen in *Figure 17*, the trait task reached sufficiency by the second wave in 1997 after two hypotheses tests. Within the trait paradigm, the four tasks analysed – TMMS, SEIS, EQ-i and TEIQue – have all reached sufficiency. Specifically, the TMMS reached sufficiency in the second wave in 1997 after two hypotheses tests (see *Figure 18*), the SEIS task reached sufficiency in the third wave in 2002 after three hypothesis tests (see *Figure 19*), the EQ-i task reached sufficiency in the first wave in 2000 after two hypothesis tests and (see *Figure 20*) and the TEIQue task reached sufficiency in the first wave in 2006 after two hypothesis tests (see *Figure 21*).

Stability has been obtained if the cumulative slope reaches 0.000, i.e., when the slope of the best-fitting regression line is as small as possible, indicating that the effect has become stable and that additional studies are unlikely to change the existing findings (Mullen et al., 2001). Therefore, *Figure 16* and *Figure 17* indicate that the EI paradigm has reached stability for both tasks. Specifically, as seen in *Figure 16*, the ability task reached stability by the third wave in 2004 after three hypotheses tests. And, as seen in *Figure 17*, the trait task reached stability by the fifth wave in 2000 after six hypotheses tests. Within the trait paradigm, the four tasks analysed - TMMS, SEIS, EQ-i and TEIQue – have all reached stability. Specifically, TMMS reached stability in the third wave in 2002 after five hypotheses tests (see *Figure 18*), the SEIS task reached stability in the second wave in 2001 after two hypotheses tests (see *Figure 19*), the EQ-i task reached stability in the second wave in 2002 after three hypotheses tests (see *Figure 20*) and TEIQue reached stability in the second wave in 2007 after seven hypotheses tests (see *Figure 21*).
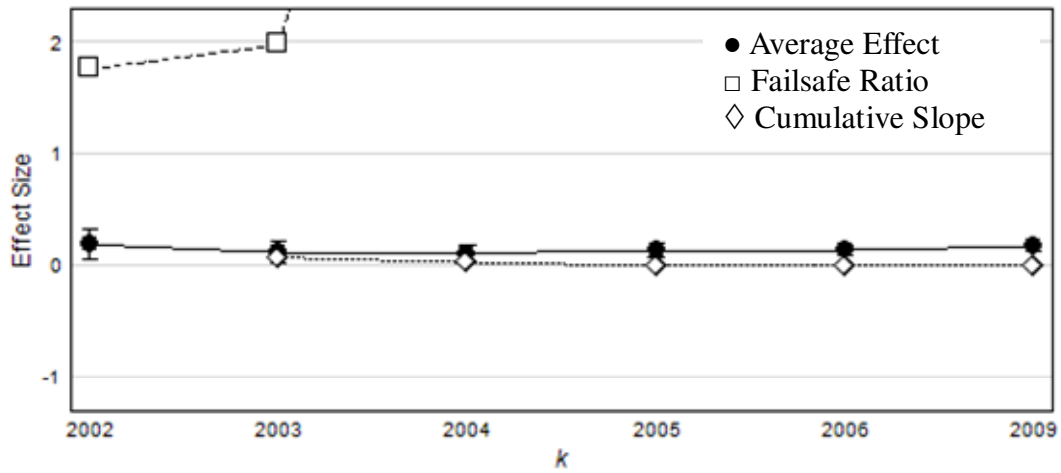
Figure 16. Cumulative Meta-Analysis for the Ability Task
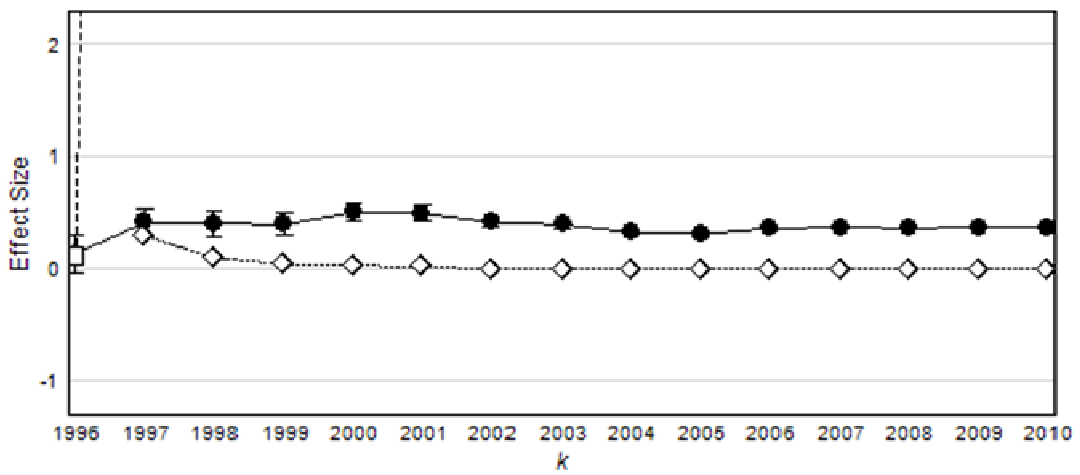
Figure 17. Cumulative Meta-Analysis for the Trait Task
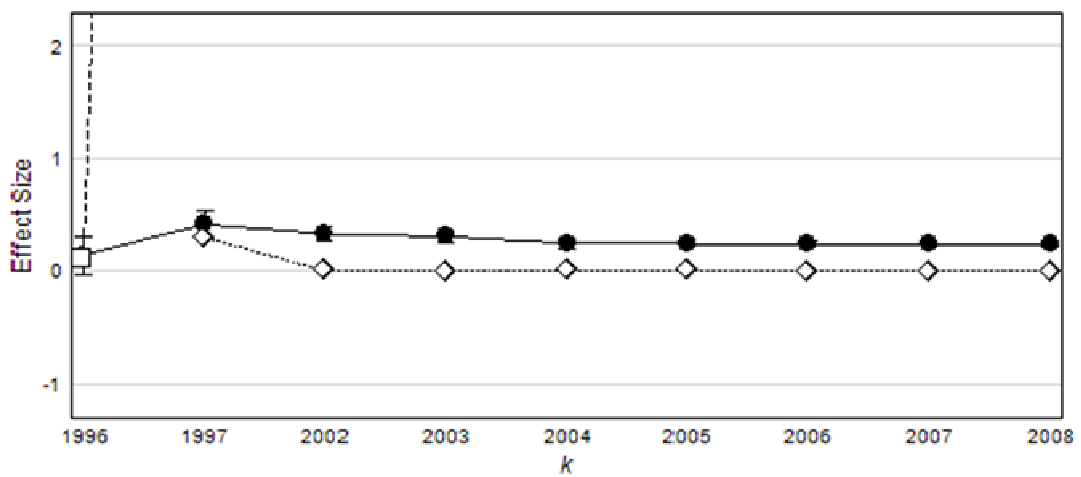
Figure 18. Cumulative Meta-Analysis for the TMMS Task

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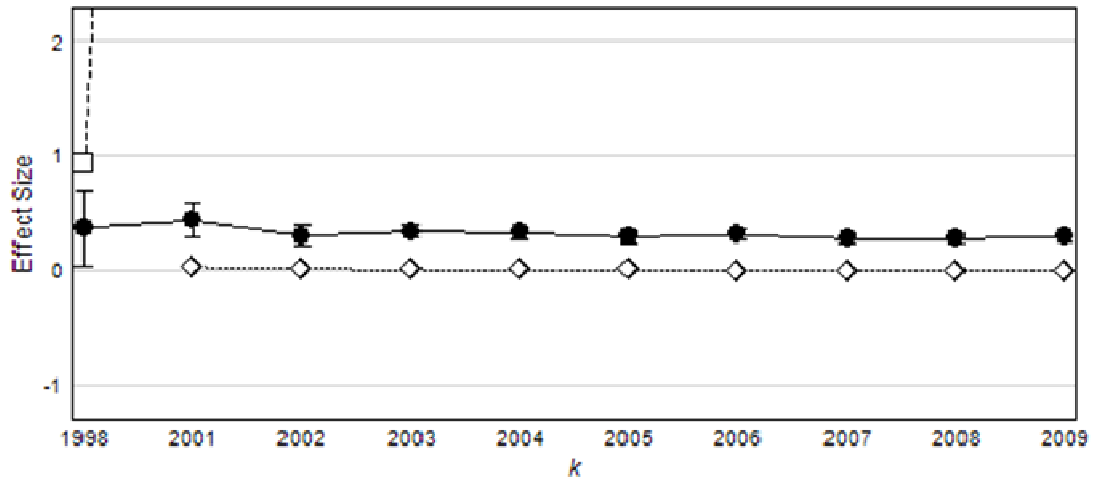
Figure 19. Cumulative Meta-Analysis for the SEIS Task
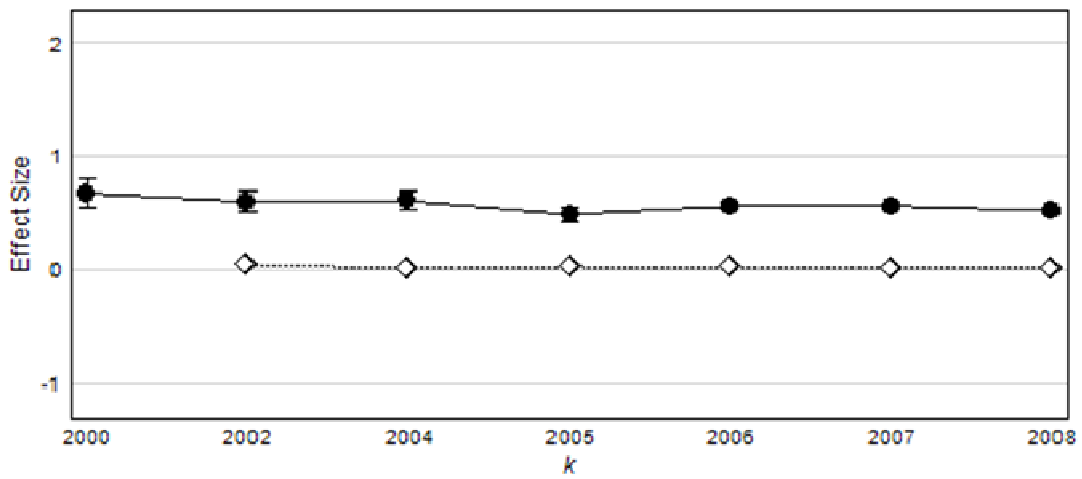
Figure 20. Cumulative Meta-Analysis for the EQ-I Task

Note. For the EQ-i task the failsafe ratio exceeded 100 from the first wave onward.
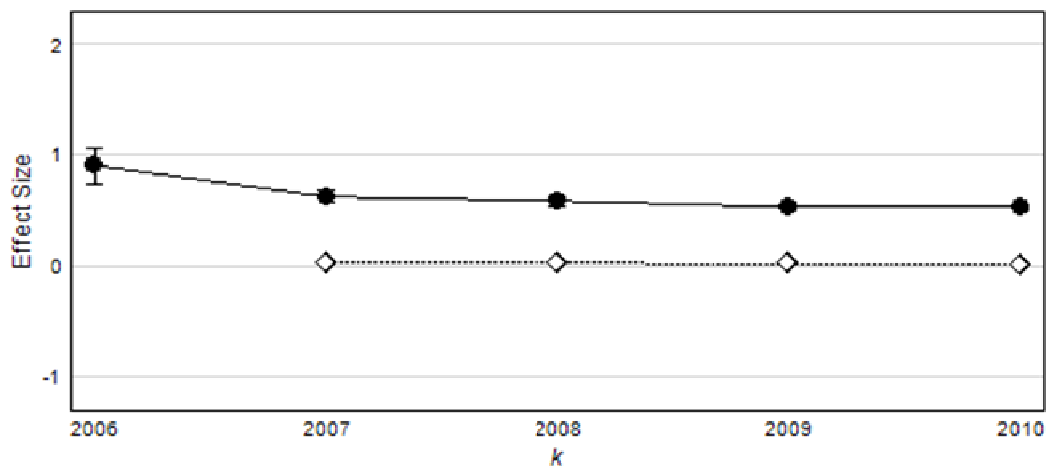
Figure 21. Cumulative Meta-Analysis for the TEIQue Task

Note.For the TEIQue task the failsafe ratio exceeded 110 from the first wave onward.

4.1.4 Discussion

The first meta-analytic studies in the EI domain were mainly concerned with construct (e.g., Van Rooy, Viswesvaran & Pluta, 2005) and predictive validity, particularly its relationship with performance (e.g., Van Rooy & Viswesvaran, 2004). Subsequently, Schutte et al. (2007) decided to take a more in-depth look at the association between EI and health and systematically reviewed studies investigating this relationship. However, due to the widespread interest in this area, numerous additional studies became available afterwards, including non-English ones. Moreover, no cumulative meta-analysis had yet been performed, at least to our knowledge, which would indicate if more investigation is required. In view of this, the present work aimed to complement and extend Schutte et al.'s (2007) findings by including studies published after their review as well as non-English ones (both before and after their study), and also by performing a cumulative meta-analysis.

After the new literature search, an additional pool of 46 studies and 63 effect-sizes were assembled and analysed together with the ones included in the prior meta-analysis. The general combinations of the total 105 effect sizes based on the responses of 19.815 participants revealed a highly significant, moderate, positive relationship between EI and health. For the trait task this effect was higher ($\bar{r} = .34$) than for the ability task ($\bar{r} = .17$) and no additional studies are needed to establish the existence of the phenomenon in either case (the fail-safe numbers were all above the threshold). Therefore, comparing the two main approaches, EI measured as a trait is apparently a better health predictor. Overall the results are congruent with the previous study by Schutte et al. (2007). However, they could be a function of "common method variance", i.e., using self-reports for both predictor and criterion variables could account for their relationship, due to response dispositions. Nevertheless, Mikolajczak, Petrides, Coumans and Luminet (2009) conducted a series of experimental studies using self-reports of EI (TEIQue) and Affectivity (PANAS), and even after controlling for Social Desirability, the association between them remained significant, excluding potential response biases.

Looking at the effects of the different instruments used to measure EI within the trait paradigm, the TEIQue and EQ-i showed stronger relationships with health ($\bar{r} = .50$ and $\bar{r} = .44$, respectively), while the SEIS and TMMS showed lower associations ($\bar{r} = .29$ and $\bar{r} = .24$, respectively). In Schutte et al.'s (2007) meta-analysis the EQ-i had the strongest relationship with mental and psychosomatic health (their study did not report the association

with health in general) but with similar results to our study. As the TEIQue was not included in previous meta-analyses, this is a new and important finding.

From the three moderator variables analysed - gender, age, and origin of the participants - only gender produced significant differences in the magnitude of the relationship between EI and health. In fact, studies that used just females significantly increased the effect of this relationship in the trait task and more specifically in the SEIS and EQ-i tasks. Overall, these results are congruent with those obtained by Schutte el al. (2007), since their study also did not find moderating effects for participants' age and origin. However, this comparison is not straightforward, as they analysed this moderation in general terms, not looking at each measure separately and compared studies that used only one gender with those that used both. Having a bigger pool of studies made possible these more specific comparisons revealing important information about the sort of measure that produces these kinds of results and within which gender group. Since neither meta-analysis found a significant effect of origin of participants (students vs. community), there seems to be no support for the skeptic idea that studies using samples of university students would not apply to clinical populations (Hansen, Lloyd, & Stough, 2009).

Considering the three health indicators, the conclusions of the present meta-analysis are consistent with those obtained by Schutte et al. (2007). Specifically, as seen in Table 14, the pattern of the effect sizes was similar, with mental and psychosomatic health showing a stronger association with EI ($\bar{r}$ = .36 and $\bar{r}$ = .33, respectively), followed by physical health ($\bar{r}$ = .27). For the mental health indicator, the magnitude of the relationship (.36) was higher than the one found by Schutte et al. (.29), but there were 44 additional effect sizes in the present study. For the psychosomatic health indicator, although there were 10 additional effect sizes included, the magnitude of the association was quite the same (.31 in their study and .33 in the present one). For physical health, even if the studies included in the present analysis were doubled, the results were quite similar, although a bit higher (.22 in the original study and .27 in the present study).Overall, these results suggest the same direction and strength.

Considering the two main approaches to assess EI, we can see in Table 14 that, unlike Schutte et al.'s (2007) meta-analysis, the trait approach had significant associations with all of the health indicators, following the same pattern indicated above for EI in general. Also, unlike the original meta-analysis, for the ability approach there was a significant association with mental health, but the magnitude was lower than for trait approach. Most likely, these differences are due to the increased number of studies in both cases.

Taking into account the different measures of trait EI approach, we can see in Table 14 that TEIQue and EQ-i have the strongest associations with mental health ($\bar{r}$ = .53 and $\bar{r}$ = .44, respectively), showing the same pattern as health in general. In Schutte et al.'s (2007) meta-analysis the EQ-i had the strongest correlations with both mental and psychosomatic health, but as noted before, the TEIQue had not been included in that study. Overall, it seems that "comprehensive" measures (e.g.,TEIQue & EQ-i) are better health predictors than "narrow" measures (e.g., SEIS & TMMS), having also the advantage of providing dimensional scores, which could help identify deficits in specific facets of trait EI related to a clinical condition or particular health problem. Mikolajczak, Petrides, Coumans, and Luminet, (2009) found that the four factors of the TEIQue had different effects on mood deterioration after induced stress. Future applications should take this into account.

The cumulative analysis included in this study showed sufficiency and stability for the ability and trait approaches, as well as for the four specific trait measures: TMMS, SEIS, EQ-i and TEIQue. The other measures did not have enough waves of investigation (i.e., in more than 2 successive points in time) to make this analysis possible, thus indicating that more research is needed to test their sufficiency and stability.

4.1.5 Conclusion

The main findings of the present meta-analysis represent an extension of the results obtained by Schutte et al. (2007) and corroborate the overall tendencies already identified by their study, reinforcing prior conclusions. First, as they already pointed out, the effect sizes for the relationship between EI and the three types of health found in the present research compare favorably to the association of .20 between EI and work performance reported by Van Rooy and Viswesvaran (2004). Schutte et al. (2007) also mentioned that a similar association between the Big Five personality dimensions and health was found in a recent meta-analysis (Malouff, Thorsteinsson, & Schutte, 2005).

However, given that in their latest meta-analysis Van Rooy, Viswesvaran and Pluta (2005) reported a .34 correlation between EI measured as a trait and personality, the question remains as to the incremental validity of EI measures beyond other predictors, especially within the trait EI approach. Future studies should concentrate on that question. A good example is the Mikolajczak et al.'s (2009) series of experimental studies in which trait EI showed incremental validity over and above the Big Five , Alexithymia, Social Desirability and Resilience in mood deterioration prediction.

The cumulative meta-analyses included in this study also added some important new data, namely that both approaches to EI (ability and trait) have already reached sufficiency and stability, as well as four specific trait EI questionnaires: TMMS, SEIS, EQ-i and TEIQue. Therefore, this reinforces the idea that future research should not concentrate on establishing the importance of the relationship between EI and health, but should instead focus on incremental validity issues. Another interesting topic for future research would be to investigate the relationships between EI and specific types of health condition (mental, psychosomatic and physical), such as personality disorders and addictions.

Overall, the results seem encouraging regarding the value of EI as a possible health predictor. Naturally, it is important to be aware that these analyses are based on correlational studies, so caution should be taken in inferring causal relationships.

4.2 EI and Academic Performance (Study 4)

Another important outcome variable is academic performance. The state of the art shows this issue deserves further inquiry as it is still facing theoretic challenges. Firstly, although EI has been claimed to help individuals prioritize reasoning and to manage emotions in social and emotional demanding situations, which are common in scholarly life (Brackett et al., 2011) evidence is inconsistent (Mavroveli & Sánchez-Ruiz, 2011). Additionally, studies tend to focus on the role of EI has a predictor, thus overlooking its possible role as a mediator between personality and academic performance. Finally, linear relationships are commonly assumed and tested but the nature of the constructs themselves may challenge this notion. These issues must be reviewed and tackled in order to better understand the link between EI and academic performance.

4.2.1 Introduction

Although some researchers found significant correlations between EI and academic performance (e.g., Brackett, Mayer, & Warner, 2004; Parker, Creque, et al., 2004; Schutte et al., 1998), others did not (e.g., Chapman & Hayslip, 2005; Newsome, Day, & Catano, 2000). Still, others found that only some measures of EI and/or only some of its facets predicted academic success. For example, Barchard (2003) reported that only the total MSCEIT score and its three subtests of the understanding emotions subscale were significantly associated with AP, unlike the trait measures (TMMS and TEIS). Brackett and Mayer (2003) also found significant results only for the MSCEIT, but not for the EQ-i or the SEIS. O'Connor and Little (2003) corroborated that MSCEIT understanding emotions subscale was the only one to

significantly correlate with academic performance, but findings showed no significant correlation for the total MSCEIT score. These authors also reported significant results for the overall EQ-i and for two of its subscales (intrapersonal and stress management). Finally, although Bastian, Burns and Nettelbeck (2005) did not find significant results for the total scores of both ability and trait EI measures, the MSCEIT's strategic subscales (understanding and managing emotions) were significantly associated with academic performance.

Therefore, the type of measurement and the specific facets should be examined in order to ascertain which EI approach, instruments and dimensions predict academic performance, and under which circumstances they occur. Currently available meta-analyses in this area do not make these important distinctions. For example, Van Rooy and Viswesvaran (2004) reported a small average corrected correlation between EI and academic performance (ρ = .10; k = 11; N = 1,370), but ability EI and trait EI measures were aggregated and their specific effects are not known. The same is true for a very recent meta-analysis in which Richardson, Abraham, and Bond (2012) reported a higher but still modest mean corrected correlation between EI and academic performance (ρ = .17; k = 14; N = 5,024).

Consequently, we performed a comprehensive review of the studies in this area, summarized in Table 16 separating ability from trait EI results, with 14 and 25 studies respectively. The review showed inconsistent patterns in both streams suggesting further moderator variables. For example, using the EQ-i, Parker, Summerfeldt, Hogan, and Majeski (2004) found low or non-significant correlations in the total sample, but when contrasting successful with unsuccessful students, significant differences were obtained: Successful students scored significantly higher on the intrapersonal scale, stress management, and adaptability. Similarly, using the TEIQue-SF, Shipley, Jackson, and Segrest (2010) found that although trait EI was not significantly associated with GPA, students in the mid-range GPA had a significantly higher mean in one of the EI subscales (well-being) than students with a low GPA. Unfortunately, these studies did not control for personality, which could be a possible confound variable.

Table 16. *Overview of the studies relating EI to Academic Performance*

		Sample			Measures		Results		
Authors	N	Level	Origin	EI	AP	r	partial r	β	ΔR^2
Ability EI									
Amelang & Steinmayr (2006)	227	secondary	Germany	TEMINT	Academic grades	.41		Controlling GMA + C: Female = -.01 Male = -.08	
Barchard (2003)	150	tertiary	USA	MSCEIT	Year-end grades	Total = .20** Understanding Blends = 21*** Transitions = .20** Analogies = .17**			Over GMA = -.014*ns* Over Big-5 = .033*ns* Over GMA + Big-5 = .005*ns*
Bastian, Burns, & Nettelbeck (2005)	246	tertiary	Australia	MSCEIT	TER	Total = .10*ns* Understand. = .33** Managing = .17*			Over GMA + Big-5 = .03*ns*
Brackett & Mayer (2003)	207	tertiary	USA	MSCEIT	GPA	Total = .16*	Controlling personality + verbal ability = .05*ns*		
Brackett, Mayer & Warner (2004)	330	tertiary	USA	MSCEIT	GPA	Total = .14* Experiential = .07*ns* Strategic = .18**			
DiFabio & Palazzeschi (2009)	124	secondary	Italy	MSCEIT	GPA	Total = .31** Facilitation = .28** Understand. = .28** Managing = .38**		Controlling G*f* + Giant-3 = .28**	Over G*f* + Giant-3: Global = .07** 4 factors = .12**
Márquez, Martín & Brackett (2006)	77	secondary	Spain	MSCEIT	GPA	Total = .46**	Controlling GMA = .43**; Controlling Big-5 = .36**		

		Sample			Measures		Results		
Authors	N	Level	Origin	EI	AP	r	partial r	β	ΔR^2
MacCann et al. (2008)	207	tertiary	Australia	STEU STEM	Psychology grade (PG) Weighted average mark (WAM)	STEU/PG = .42** STEM/PG = .34** STEU/WAM = .37** STEM/WAM = .16*	Controlling verbal ability + Big-5: STEU/PG = .31**; STEM/PG = .27**; STEU/WAM = .26**; STEM/WAM = .06ns		
MacCann et al. (2011)	159	tertiary	USA	MSCEIT	GPA	Perception = .22** Facilitation = .39** Understand. = .37** Managing = .44**			
MacCann et al. (2011)	293	secondary	USA	STEM-Y	GPA (self/parent reported	.28**			
O'Connor & Little (2003)	90	tertiary	USA	MSCEIT	GPA	Understanding = .23*			
Rode et al. (2007)	378	tertiary	USA	MSCEIT	GPA	.16**		Controlling GMA + Big-5: EI = .06ns EI x C = .14*	Over GMA + Big-5: EI = .00ns EI x C = .01**
Rode et al. (2008)	412	tertiary	USA	MSCEIT	GPA	Faces = -.02ns Pictures = .10* Facilitation = .08* Sensations = .02 ns Changes = .20** Blends = .21** Em. Manag = .12** Em. Relations = .14**		Controlling GMA + Big-5 + Affect = .08ns	Over GMA + Big-5+ Affect = .00ns

		Sample			Measures		Results			
Authors	N	Level	Origin	EI	AP	r	partial r	β	ΔR^2
Rode et al. (2008)	655	tertiary	USA	MSCEIT	GPA	Faces = .02 *ns* Pictures = -.02 *ns* Facilitation = .07 *ns* Sensations = .06 *ns* Changes = .13** Blends = .16** Em. Manag. = .06 *ns* Em. Relations = .08*		Controlling GMA + Big-5+ Affect = .08*ns*	Over GMA + Big-5+ Affect = .00*ns*
Trait EI									
Adeyemo (2007)	300	tertiary	Nigeria	SEIS	1st semester examination results	.33**		Controlling demographic variables: EI = .28**; EI x Academic self-efficacy = .53**	
Amelang & Steinmayr (2006)	227	secondary	Germany	TMMS	Academic grades	Clarity = .55; Attention = .02; Repair = .43		Controlling GMA + C: Female = -.07; Male = -.08	
Austin et al. (2007)	273	tertiary	UK	SEIS (41 items)	Year-end grades	*ns* (values not reported)			
Barchard (2003)	150	tertiary	USA	TEIS TMMS	Year-end grades	(from .13 to -.18) *ns*			Attention (TMMS) = .03** Flexible planning (TEIS) = .02**
Bastian, Burns, & Nettelbeck (2005)	246	tertiary	Australia	SEIS TMMS	TER	Total = .07*ns*			Over GMA + Big-5 = .00*ns*
Brackett & Mayer (2003)	207	tertiary	USA	EQ-i	GPA	EQ-i =.10*ns* SEIS =.06*ns*	Controlling personality + verbal ability: EQ-i = -.08*ns*; SEIS = -.10*ns*		

	Sample			Measures		Results			
Authors	N	Level	Origin	EI	AP	r	partial r	β	ΔR^2
Chapman & Hayslip (2005)	292	tertiary	USA	SEIS	GPA (self-reported)	.08*ns*		Controlling GMA + Big-5 = -.01*ns*	Over GMA + Big-5 = .00*ns*
DiFabio & Palazzeschi (2009)	124	secondary	Italy	EQ-i:SF	GPA	Total = .22* Intra = .19* Inter = .05*ns* Stress mng. = .14*ns* Adaptability = .24**		Controlling Gf + Giant-3 = .23*	Over *Gf* + Big-3: Global = .05* 4 factors = .06*
Downey et al. (2008)	209	secondary	Australia	SUEIT (Adolescent)	GPA Subject grades	Total EI: GPA = .15* Geography = .27** Science = .14* Managing: GPA = .15* Maths = .24** Science = .19* Understanding: Art = .34** Geography = .28** Science = .18*			
Ferrando et al. (2010)	290	primary	Spain	TEIQue-ASF	Head teacher rated general performance	.29**		Controlling IQ + personality + self-concept = .20*	Over IQ + personality + self-concept = .03*
Hogan et al. (2010)	192	secondary	Canada	EQ-i:YV	GPA			Controlling verbal IQ + gender + socio-economic status: Male = .32** Female = .20** Adaptability = .20** Stress Mng = .20**	Over verbal IQ + gender + socio-economic status: Total = .11 Adaptability = .03 Stress Mng. = .03

	Sample			Measures		Results			
Authors	N	Level	Origin	EI	AP	r	partial r	β	ΔR^2
Mavroveli et al. (2009)	140	primary	UK	TEIQue-CF	End-of-year scores (English/Maths)	English = .24** Maths = .26**	Controlling age + non-verbal IQ: English = .13*ns*; Maths = .18*ns*		
Mavroveli & Sánchez-Ruiz (2011)	565	primary	UK	TEIQue-CF	Key Stage 1 (SAT) results (maths/ reading/writing)	Maths (year 3) = .25**			
Newsome, Day & Catano (2000)	180	tertiary	Canada	EQ-i	GPA	Intra = -.05*ns* Inter = -.04*ns* Stress Mng. = -.04*ns* Adaptability = .08*ns* Gen. Mood = -.09*ns*			
O'Connor & Little (2003)	90	tertiary	USA	EQ-i	GPA	Total = .23* Intra = .22* Stress Mng = .29**			
Parker, Creque et al. (2004)	667	secondary	Canada	EQ-i:YV	GPA	Total = .33* Intra = .08* Inter = .32* Adaptability = .27* Stress Mng = .24*		Total = .41*	
Parker, Summerfeldt, Hogan, & Majeski (2004)	372	tertiary	Canada	EQ-i:SF	High School GPA/University GPA (1st year)	High School GPA: *ns* for all EQ-i scales University GPA: Total = .20* Intra = .27* Adaptability = .37* Stress Manag. = .32*			
Pérez & Castejón (2007)	250	tertiary	Spain	SEIS TMMS-24	Year-end grades	SEIS: Total = .14*ns*; Regulation = .23** TMMS: Attention = -.20* Clarity = .16* Repair = .17*		Controlling IQ: SEIS Regulation = .228*; TMMS Attention = -.195*	Over IQ: Regulation (SEIS) = .026*; Attention (TMMS) = .047*; Clarity (TMMS) = .030*

		Sample		Measures			Results		
Authors	N	Level	Origin	EI	AP	r	partial r	β	ΔR^2
Petrides, Frederickson, & Furnham, 2004	650	secondary	UK	TEIQue	KS3/GCSE		Controlling Giant-3: IQ x EI = -.051* (English); IQ x EI = -.066* (GCSE)	IQ x EI = -.055* (English); IQ x EI = -.066** (GCSE)	
Saklofske et al. (2012)	156	tertiary	UK	EQ-i	Year mark	Adaptability = .17*		Controlling A + PA + C: Adaptability + task-oriented coping = .25	
Schutte et al. (1998)	64	tertiary	USA	SEIS	GPA	.32**			
Shipley, Jackson & Seagrest (2010)	169	tertiary	USA	TEIQue-SF	GPA (self-reported)	Well-being = .09*ns* Self-control = .04*ns* Emotionality = .08*ns* Sociability = .10*ns*			
Song et al. (2010)	222	tertiary	China	WLEIS	GPA	.22**		Controlling GMA + Big-5 = .17**	Over GMA + Big-5 = .03**
Tok & Morali (2009)	295	tertiary	Turkey	SEIS (41 items)	GPA	Optimism = .01*ns* Utilization = .06*ns* Appraisal = .08*ns*		Controlling Big-5 + Social Desirability: Optimism = -.15*ns*; Utilization = .12*ns*; Appraisal = .01*ns*	Over Big-5 + Social Desirability = .02*ns*

	Sample			Measures		Results			
Authors	N	Level	Origin	EI	AP	r	partial r	β	ΔR²
Van der Zee, Thijs & Scakel (2002)	116	tertiary	Netherlands	EIS	Mean grade Grade points Study pace	Empathy = .46 Autonomy = .41 Emotional control (not reported)	Controlling one of the Big-5 + intelligence: empathy = .27**; autonomy = .26**	Controlling one of the Big-5 + intelligence: empathy = .22**; autonomy = .27**	Over one of the Big-5 + intelligence: empathy = .04; autonomy = .07

Note. Only relevant results are presented; KS3 = Key Stage 3 Assessment (KS3); GCSE = General Certificate of Secondary Education; GPA = Grade Point Average; TER = Tertiary Entrance Rank; GMA = General Mental Ability; Gf = fluid intelligence; C = Conscientiousness; Big-5 = Big Five personality factors; Giant-3 = Giant three personality factors (Extraversion, Neuroticism and Psychoticism); TEIS = Tett's Emotional Intelligence Scale; MSCEIT = Mayer-Salovey-Caruso Emotional Intelligence Test; Intra = Intrapersonal; Inter = Interpersonal; EIS = Emotional Intelligence Scale (Van der Zee, Thijs, & Schakel, 2002); TMMS = Trait Meta-Mood Scale; TEMINT = Test of Emotional Intelligence; SUEIT = Swinburne University Emotional Intelligence Test.

* p<.05; ** p<.01; *ns* = non-significant

Besides these moderators, one should note that the results obtained with middle and high school students may be stronger than those obtained with university students due to range restriction of grades in tertiary level (Brackett et al., 2011). Moreover, it is possible that similarly to the Big Five, the strength of correlations decreases as educational level and age increase, as shown by Poropat's (2009) meta-analysis. Table 16 shows that the highest effect-sizes for both ability and trait EI were obtained with secondary students (e.g., Amelang & Steinmayr, 2006; Di Fabio & Palazzeschi, 2009; Márquez, Martín, & Brackett, 2006; Parker, Creque, et al., 2004) and the lowest associations were obtained at the tertiary level (e.g., Newsome et al., 2000; Shipley et al., 2010; Tok & Morali, 2009). The only exception occurred in Schutte's et al. (1998) and Adeyemo's (2007) studies that used the same instrument.

Petrides, Frederickson, and Furnham (2004) suggested that, given its personality-like nature, trait EI should not be expected to show strong associations with intelligence or proxies such as academic performance. Instead, it might be expected to act as a moderator of the effects of cognitive ability on academic performance (especially in vulnerable groups, like individuals with low IQ). Indeed, they found, via SEM analysis, that EI moderated the relationship between cognitive ability and both overall academic performance and English, but it had no significant effect on maths or science performance. This pattern held even after controlling for personality. Moreover, though high trait EI played an important role for low IQ pupils, for the high IQ group no significant differences were found between the high and low trait EI pupils. Therefore, the effect of trait EI was subject and group specific. In a recent five-year longitudinal study with secondary students Qualter, Gardner, Pope, Hutchinson, and Whiteley (2012) found that although ability EI moderates the effect of cognitive ability on academic performance, trait EI has a direct effect on academic performance, but only for boys.

Regarding incremental validity, several studies confirm that both ability and trait EI explain additional variance after controlling for other relevant individual differences, such as personality and cognitive ability. Van der Zee, Thijs, and Schakel (2002) reported that trait EI was still related to academic and social success after controlling for personality and intelligence. This was true for both self and other ratings of EI, excluding common method variance as a plausible explanation. However, only one of the Big Five traits was included in the earlier blocks of the regressions. Márquez, Martín, & Brackett (2006) also found significant correlations between the MSCEIT and academic performance, after controlling for general intelligence and the Big Five (although separately).

Additionally, Pérez and Castejón (2007) reported incremental validity for two TMMS scales (attention and clarity) and for the emotion regulation subscale of the SEIS over IQ. Hogan et al. (2010) also found evidence for two of the EQ-i's incremental validity (adaptability and stress management), after controlling for verbal IQ, gender, and socioeconomic status. However, these studies did not control for personality, which could be a confound variable, especially when using self-reported EI.

Di Fabio and Palazzeschi (2009) found that both the MSCEIT and the EQ-i predicted GPA after controlling for both fluid intelligence and personality. Song et al. (2010) also reported that the WLEIS predicts academic performance, after controlling for GMA and personality traits (as well as three demographic variables). Similarly, Ferrando et al. (2010) found that the TEIQue-ASF had incremental validity over IQ, personality, and self-concept. MacCann and Roberts (2008) also reported incremental predictive validity beyond the effects of intelligence and personality for the STEU, but not for the STEM, confirming that, among the ability EI branches, understanding is the strongest predictor of academic performance.

In contrast, Barchard (2003) found that although the MSCEIT predicted academic success, it did not show incremental validity over cognitive ability and personality. Brackett and Mayer (2003) also found that after controlling for personality and verbal ability, different measures of EI (SEIS, EQ-i and MSCEIT) no longer correlated significantly with GPA. Similarly, based on SEM analysis Amelang and Steinmayr (2006) reported that both trait (TMMS) and ability EI (TEMINT) could not explain any variance in GPA beyond general intelligence and conscientiousness. Mavroveli, Petrides, Sangareau, and Furnham (2009) also found no support for trait EI's incremental predictive validity: Although the TEIQue-CF correlated significantly with primary children's school performance in maths and English, after controlling for age and non-verbal intelligence these correlations lost their significance. Finally, two studies with three large samples found no support for ability EI's incremental predictive validity, after controlling for GMA and personality (Rode et al., 2007, 2008) . However, Rode et al. (2007) reported that although the MSCEIT was not incrementally associated with GPA, , it interacted with conscientiousness explaining unique variance in this outcome. Specifically, the EI-performance link was stronger at high levels of conscientiousness than at low levels.

In sum, the literature review on the relationship between trait EI and academic performance established a number of important moderators such as the way both constructs are operationalized (e.g., type of measure, global vs. specific scores), the characteristics of the sample (e.g., students' level of success, educational level, age, gender and IQ), and the control

variables used (e.g., personality, cognitive ability). EI has also been taken as a moderator of the relationships between traditional predictors, such as intelligence and personality with many outcomes. Although much is known about the moderator effects in this area, little research has been examined EI's potential role as an intermediary variable. As Ackerman, Chamorro-Premuzic, and Furnham (2011) recently suggested, examining the mediating factors between the personality-academic performance path would enrich our understanding of the processes by which non-ability traits affect educational outcomes.

In line with the third challenge and following Ackerman's et al. (2011) suggestion to examine mediators in the link between personality and academic performance, we conducted a study to test trait EI as a possible mediator of this relationship, given its intimate association with personality. Our aim is to move beyond testing simple direct effects and examine the role of EI as an explanatory mechanism in the process that links these variables. As far as we know there are no published studies testing this mediation.

Moreover, as mentioned previously, research tended to use EI as a whole piece overlooking the impact of its different facets on the outcome variables. As noted by Newman, Joseph, and MacCann (2010) it is important to analyse EI not as single block but as a multidimensional construct, where each facet has a different status and a different relationship with the other predictor and outcome variables. These authors also suggested that EI facets may serve as mediators of the effects of Big Five on behaviour, and that future research could benefit from examining these mechanisms. Similarly, Antonakis, Ashkanasy, and Dasborough (2009) stated that the most interesting findings have been related to EI's individual facets rather than global scores. They claimed that researchers would benefit from focusing on these separate facets to reduce some of the overlapping variance with personality and intelligence. Zeidner, Matthews, and Roberts (2012) also regret that several researchers are still working only with global trait EI scores and agreed that working with EI subscales may allow for more in-depth interpretation.

Therefore, in our study we examined the role of EI's core facets as mediators, using our Core Components model presented in Chapter 4. The basic idea is to find out their relative importance and unique offerings to academic performance controlling for other important predictors, such as the Big Five personality traits.

Furthermore, as noted by Zeidner, Roberts, and Matthews (2008), research should adopt a more comprehensive concept of academic success and include other important outcome variables such as retention, citizenship, and psychological well-being. In response to this call,

we propose subjective well-being as an important additional outcome for a successful academic life, given its daily socio-emotional demands.

Although there are already studies investigating the mediator role of EI in the link between personality and mental health and well-being, they usually take EI as a single block, overlooking the specific contribution of its facets (e.g., Greven et al., 2008; Johnson et al., 2009). Moreover, these studies used an EI measure which includes a well-being scale (TEIQue), raising doubts about predictor-criterion contamination (Zeidner et al., 2012). Therefore, this is an intriguing area for further examination and our study aims to extend previous findings by investigating EI's facets as mediators between personality and both GPA and subjective well-being, using a different instrument.

Figure 22 presents the research model that summarizes the expected relationships among the intended variables in this study. Since the links between EI and both performance and health related outcomes have already been discussed in the previous sections we will now briefly review the relevant findings on the links between personality and both outcomes. Finally, we will discuss a very important issue that will be examined in our study: the assumption of linearity. Past research repeatedly employed statistical techniques that assume linear relationships between variables (e.g., multiple regression and covariance based SEM analyses). This may help explain some inconsistent findings, particularly when EI was measured as a trait, where curvilinear relationships are expectable (Bechtoldt, 2008). Further, testing for nonlinear relationships provides a much richer view of the associations between variables, and sometimes leads to path coefficients that are different from (often higher than) those obtained through a linear analysis (Kock, 2010).
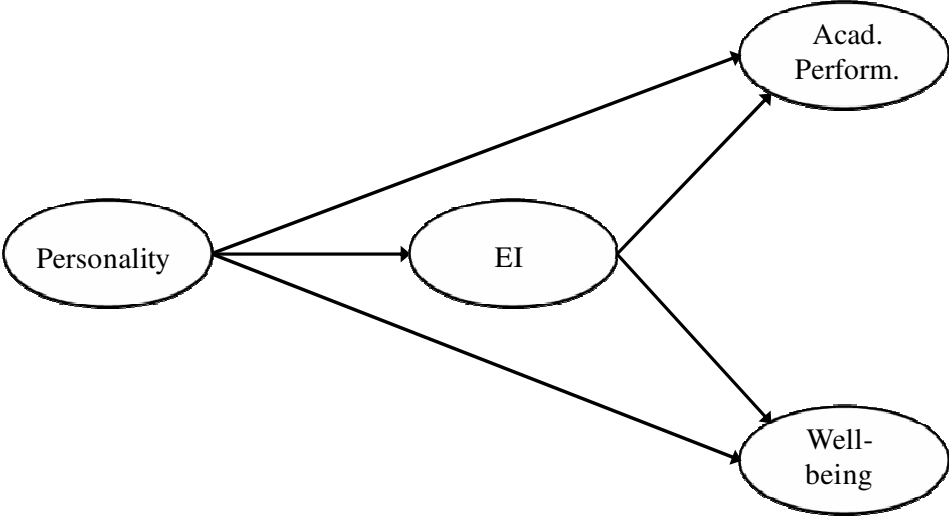

Figure 22 - Research model linking Personality, EI, Academic Performance and Well-being

Personality and Academic Performance. A meta-analysis by Poropat (2009) reported that academic performance was significantly associated with agreeableness, openness to experience and especially with conscientiousness. Furthermore, controlling for intelligence had little effect on these relationships. Conscientiousness' mean corrected correlation with academic performance ($\rho =. 22$; $k = 138$; $N = 70,926$) was comparable to that of intelligence ($\rho =. 25$; $k = 47$; $N = 31,955$). Moreover, when secondary level academic performance was controlled for, the effect of conscientiousness on performance at the university level, was even slightly higher than that of intelligence ($r_{partial} = .17$ and $.14$, respectively). Finally, Poropat (2009) found that academic level (primary, secondary or tertiary) and participants' average age, as well as for the interaction between them, are important moderators of the personality-academic performance link. Overall, the strength of correlations decreased as educational level and age increased (except for conscientiousness in both cases and for extroversion in the second case). Analyses of the effect of age within each academic level revealed that no significant moderating effects of age occurred at the tertiary level.

The latest systematic review and meta-analysis regarding the psychological correlates of university student's performance corroborated that aside from the traditional cognitive correlates (e.g., high school GPA and SAT/ACT scores) conscientiousness is the strongest correlate of academic performance ($\rho = .23$), within the Big Five personality factors (Richardson et al., 2012). The mean corrected correlations for the remaining Big Five traits with GPA were all bellow .10, with neuroticism showing the lowest association ($\rho = .01$ *ns*). This review supports Poropat's (2009) conclusions and adds to them by showing the influence of other important non-five-factor traits, such as procrastination ($\rho = -.25$), need for cognition ($\rho = .17$) and EI ($\rho = .17$). Notably, regression models showed that EI ($\beta = .11$) explained additional variance controlling for conscientiousness ($\beta = .18$) and that together they explained 5% of GPA variance.

Personality, Health & Subjective Well-being. The personality-health link is well documented and neuroticism seems to play a major role, but there are few mediation studies that investigate mechanisms explaining these associations (Smith, 2006). Huppert's (2009) review of the causes and consequences of psychological well-being concluded that personality is one of the strongest predictors of the emotional style. More specifically, whereas extraversion is strongly associated with a positive emotional style, neuroticism is associated with a negative emotional style.

Although these direct links seem to be already established, the investigation of the potential mediator role of EI in these relationships is still deficient. Studies examining mediators between personality and health are relatively recent (e.g., Greven, Chamorro-Premuzic, Arteche, & Furnham, 2008; Johnson, Batey, & Holdsworth, 2009). By means of SEM analysis these studies found that trait EI fully mediated the paths between personality and health, except for neuroticism, which still had a significant direct effect on health. These results confirm the importance of using an integrated multistage model in which lower-order traits mediate the impact of higher-order traits on health (Greven et al., 2008) . This approach offers a much richer view of how multiple traits combine to jointly impact on the outcome variable. However, the existing studies usually take EI as a single block, overlooking the specific relationships between its different facets and the outcome variables.

The Assumption of Linearity. Many relationships between variables concerning both natural and behavioural phenomena are nonlinear (Kock, 2011). As pointed out by Bechtoldt (2008), though the relationship between intelligence and adaptability seems to be linear, with regard to personality variables, curvilinear relationships are more appropriate. Nevertheless, most literature on the personality-performance link assumes linearity and few studies have investigated curvilinear relationships (Le et al., 2011). For example, Cucina and Vasilopoulos (2005) found evidence for curvilinear relationships between two of the Big Five personality traits (openness and conscientiousness) and academic performance. Also, a recent study based on two independent samples found curvilinear relationships between personality (namely conscientiousness and emotional stability) and job performance (Le et al., 2011).

Similarly, most EI literature assumes that higher EI means better outcomes for both individuals and organizations (Kilduff, Chiaburu, & Menges, 2010). But the question still remains about the possibility that EI has both positive and negative effects. As in personality, an optimal level of EI may be necessary to keep emotions and relationships in the desired direction, but excessive EI may be perceived as overloading or overly controlling, thus generating negative reactions. Probably, EI requires some balance, and therefore, may demonstrate nonlinear effects on attitudes and behaviour. For instance, to be aware of emotions it is important to find effective ways to manage them, but it can also be stressful if individuals feel they don't have enough resources to deal with them (e.g., ability, experience, time and energy). Further, the unpredictability of other's reactions may lead to feelings of inadequacy or guilt.

As pointed by Petrides and colleagues (Petrides, Furnham, et al., 2007; Petrides & Sevdalis, 2010) there are circumstances and contexts where high EI scores are associated with maladaptive outcomes. For example, after the presentation of a short distressing video, high trait EI individuals showed greater mood deterioration than those with low scores (Petrides & Furnham, 2003) and when faced with a negative event or poor decision outcome, high EI individuals experienced stronger negative emotions than the low EI participants (Sevdalis et al., 2007).

Poropat (2009) also noted the importance of testing for the presence of nonlinear relationships, because they may produce non-significant linear correlations, even when they are strong. In this sense, previous results obtained with linear techniques may have underestimated the overall correlations. Therefore, this author encourages future studies to examine for the presence of nonlinearity.

To our knowledge, the only empirical study explicitly testing curvilinear associations in EI's domain was presented in a conference (Singh & Seo, 2010). Based on a sample of 303 MBA students, these authors found support for an inverse-U relationship between EI and performance (rated by their supervisors). Moreover, they also found that the relationship is contingent on job context.

Therefore, the purpose of this study is to contribute to the development of EI's research in this area in three ways: (1) by taking EI as an explanatory mechanism between personality and academic performance; (2), by taking EI as a multifaceted construct instead of a global one; and (3) by exploring possible nonlinear relationships. To accomplish this purpose we tested our proposed research model based on a nonlinear approach.

4.2.2 Method

Participants and Procedure

The sample for this study consisted of 160 university students from a military academic institution, of which 131 (83%) were men. Ages ranged from 18 to 39 years (M_{age} = 24 years; SD = 5). Respondents were enrolled in different courses (e.g., Engineering, Communications, and Medicine) and in different academic levels (from undergraduate to postgraduate).

The data was collected during March 2010 with an online survey e-mailed to the students, together with a message from the commander, to legitimate the study and to motivate participation. An alternative printed version was distributed to those who did not have access to the internet or that preferred this response format. The survey was preceded by

a memo explaining the aims of the study and guaranteeing confidentiality of the collected individual data.

Measures

Personality was measured with a Portuguese version of the *Mini-IPIP* inventory (Donnellan, Oswald, Baird, & Lucas, 2006), a short form of the 50-item IPIP-FFM (Goldberg, 1999). This 20-item instrument assesses the Big Five dimensions of personality (4 items each): extroversion (e.g., "I am the life of the party"), agreeableness (e.g., "I sympathize with others' feelings"), conscientiousness (e.g., "I get chores done right away"), neuroticism (e.g., "I have frequent mood swings") and openness to experience (e.g., "I have a vivid imagination"). The complete list of items is shown in Appendices E (English) and F (Portuguese). Respondents were requested to rate themselves on a 6-point Likert scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*).

Emotional intelligence was measured with our 29-item EI questionnaire (used to test the proposed Core Components model of EI; see chapter 4), which assesses three dimensions of the construct: intrapersonal EI - perceiving and regulating emotions in self - includes 9 items (e.g., "When someone upsets me I have difficulty in managing my feelings of rage"), interpersonal EI - perceiving and regulating emotions in others - includes 11 items (e.g., "I usually know what to do to cheer up someone who is feeling sad"), and mobilization of emotions - using emotions to sustain goal-directed behaviour - includes 9 items (e.g., "When I have something difficult to do, I usually imagine that everything is going to turn out well, so that I feel more confident"). The complete list of items is shown in Appendices C (English) and D (Portuguese). Respondents were requested to rate themselves on a 6-point Likert scale ranging from 1(*strongly disagree*) to 6 (*strongly agree*).

Subjective well-being was measured with a Portuguese version of the 12-item Job-related Affective Well-being questionnaire (Warr, 1990), which assess positive emotions with 6 items (e.g., "cheerful") and negative emotions with 6 items (e.g., "tense"). The complete list of items is shown in Appendices G (English) and H (Portuguese). Respondents had to judge how frequently they felt each emotion when performing their tasks as students, in the past few weeks, on a 6-point scale ranging from 1 (*never*) to 6 (*all the time*).

Academic performance was measured with a single item requesting the participant to indicate his/her overall grade point average (GPA) at the moment the survey was taken, based on a scale from 0 to 20.

Statistical Analysis

To analyse the data we used WarpPLS 3.0, a Partial Least Squares (PLS) based structural equation modelling (SEM) software that identifies nonlinear or "warped" relationships among latent variables and corrects the values of path coefficients accordingly. It also models linear relationships, using a standard PLS regression algorithm, but unlike covariance based SEM (CBSEM), it is less restrictive in its distributional assumptions and minimal sample size. Moreover, PLS is preferable to CBSEM when the focus is on prediction and theory development, as well as when complex models with large numbers of indicators and/or latent variables are tested (Chin, 2010).

Unlike other PLS softwares, WarpPLS calculates P values for path coefficients, model fit indices, and multicollinearity estimates (VIF coefficients). Model fit indices include the Average Path Coefficient (APC), the Average R-squared (ARS) and the Average Variance Inflation Factor (AVIF). It is recommended that the P values for both the APC and ARS are both bellow .05 and that the AVIF is below 5 (Kock, 2012).

WarpPLS also allows for the evaluation of the measurement model (outer model), i.e., the relations between manifest variables (observed items) and latent variables. This ensures that only reliable and valid measures are used before assessing the nature of relationships in the overall model. Convergent validity is assessed by examining the items' loadings on their respective construct. Higher loadings show that there is more shared variance between the construct and its indicators than error variance. Here, two criteria are recommended: that the P values associated with the loadings fall below .05; and that the loadings be equal to or greater than .50 (Kock, 2012).

Scale reliability is assessed with composite reliability (CR) that should be equal to or greater than .70. As compared with Cronbach's alpha, CR offers a better estimate of variance shared by the respective indicators and uses the item loadings obtained within the nomological network (Hair et al., 2010). Average variances extracted (AVE) are also provided for all latent variables, and are used in the assessment of discriminant validity. An AVE value greater than 0.50 indicates that a latent variable explains more than half of the variance and it is also recommended that for each latent variable, the square root of the AVE should be higher than any of the correlations involving that latent variable.

In addition, WarpPLS 3.0 provides full collinearity tests for all latent variables, detecting not only vertical or classic collinearity (i.e., predictor-predictor latent variable collinearity) but also lateral collinearity (i.e., predictor-criterion latent variable collinearity). This analysis is useful for common method bias identification in a more comprehensive and

conservative way than classical exploratory factor analyses. It is recommended that full collinearity VIFs should be below 3.3, but a less conservative criterion suggests VIFs should be lower than 5 and an even more relaxed one states that they should be lower than 10 (Kock, 2012).

To evaluate the statistical significance of each path coefficient in the structural models we performed a nonparametric bootstrapping procedure using 100 subsamples, as recommended (Kock, 2012). Because the warping algorithms are sensitive to the presence of outliers we also used Jackknifing to compare results and identify the most reliable P values, as suggested by Kock (2012). This procedure revealed that the P values estimated through Jackknifing were more stable in our sample (i.e., are expected to be significant for paths around .20 for a sample size of 100).

For the mediated models we followed Hayes' (2009) recommendation which stipulates that researchers do not require a significant total effect before proceeding with tests of indirect effects. This author states that a failure to test for indirect effects in the absence of a total effect can lead the researcher to miss some potentially interesting, important, or useful mechanisms by which X influences Y. WarpPLS 3.0 automatically calculates indirect effects and related P values, allowing for the test of multiple mediating effects at once, including those with more than one mediator.

4.2.3 Results
Latent Variables Coefficients and Correlations

Table 17 presents the latent variables coefficients' regarding the retained number of items, the scales' reliabilities, AVEs, and full VIFs for this study. We removed items with low loadings on the respective construct or with high cross-loadings. All measures show good internal consistency (CRs > .70), adequate discriminant validity (mean AVE = 57%, ranging from 46% to 82%) and no collinearity problems, including common method bias (full VIFs < 3.3).

Table 17. *Latent Variable's Coefficients for WarpPLS Study 1*

Variable	Items	CR	AVE	Full VIF
Extroversion (E)	3	.759	.517	1.224
Agreeableness (A)	2	.899	.816	2.336
Conscientiousness (C)	3	.820	.603	2.036
Neuroticism (N)	4	.776	.468	2.373
Openness (O)	3	.827	.614	1.946
Intrapersonal EI (Intra-EI)	6	.853	.493	1.976
Interpersonal EI (Inter-EI)	9	.884	.460	2.737
Mobilization of Emotions (ME)	9	.889	.474	2.924
Positive Emotions (PosE)	6	.923	.666	1.885
Negative Emotions (NegE)	6	.882	.557	1.906

Note. CR = composite reliability; AVE = average variances extracted; VIF = Variance Inflation Factor.

Table 18 displays the mean, SD, correlations and square roots of AVEs for each variable. As shown, all the Big Five scales are significantly related among themselves, except for extroversion, which is only associated with neuroticism (r = -.22; p < .01). Likewise, all EI scales are significantly related among themselves, as well as with most of the Big Five (being extroversion and Intra-EI the only non-significant link). Regarding the correlations with subjective well-being, whereas agreeableness and neuroticism are significantly associated with both positive and negative emotions, extroversion and openness are not significantly associated with subjective well-being at all and conscientiousness is only significantly correlated with positive emotions. In contrast, all EI facets show significant relationships with both aspects of subjective well-being. Regarding academic performance, within the Big Five personality factors only neuroticism and openness are significantly associated with this criterion (r = -.19 and .22, respectively; p < .05) and within EI facets only Intra-EI has a significant relationship with it (r = .20; p < .05). Finally, positive emotions are also significantly related to GPA (r = .18; p < .05).

Table 18 indicates a potential discriminant validity issue between Inter-EI and ME (the correlation is higher than the square root of their AVEs), we did not consider it problematic as they are both measuring the same second order latent variable (EI). Moreover, full VIFs do not suggest any multicollinearity problems. Finally, we kept these variables separated in order to capture the specific relationships with other variables.

Table 18. *Latent Variables Correlations for WarpPLS Study 1*

Variable	M	SD	1	2	3	4	5	6	7	8	9	10
1. Extroversion	3.5	1.1	(.719)									
2. Agreeableness	4.2	1.3	-.016	(.904)								
3. Conscientiousness	4.2	1.2	-.089	.623***	(.777)							
4. Neuroticism	3.0	1.1	-.220**	-.527***	-.441***	(.684)						
5. Openness	4.0	1.2	-.078	.638***	.509***	-.416***	(.784)					
6. Intra-EI	4.0	1.2	.098	.497***	.408***	-.622***	.462***	(.702)				
7. Inter-EI	3.9	1.0	.306***	.287***	.322***	-.459***	.181*	.215**	(.678)			
8. Mobiliz. Emotions	3.9	1.0	.204*	.301***	.433***	-.444***	.160*	.250**	.763***	(.688)		
9. Positive Emotions	3.7	1.1	.088	.238**	.254**	-.415***	.049	.268***	.343***	.402***	(.816)	
10. Negative Emotions	2.7	1.0	-.193	-.190*	-.095	.440***	-.110	-.407***	-.253**	-.167*	-.581***	(.746)
11. GPA [a]	13.6	1.1	-.124	.170	.083	-.193*	.220*	.198*	.122	.110	.184*	-.119

Note. Square roots of average variances extracted (AVEs) shown on diagonal (within parentheses); [a] This row refers to a sub-sample of 128 participants who reported their GPA; All variables had a similar 1-6 range of answers except GPA (min=10, max=16).

* $p < .05$; ** $p < .01$; *** $p < .001$

Structural Models

This section presents the results of several structural models testing the causal relationships between: (a) personality and EI; (b) personality, EI and academic performance; (c) personality, EI and subjective well-being. For simplicity reasons, the figures show only the significant relationships, together with the beta coefficients (β), effect sizes (f^2) and the R^2 values. For effect sizes, WarpPLS reports Cohen's (1988) f^2 coefficients, representing the absolute values of the individual contributions of the corresponding predictor latent variables to the R^2 coefficients of the criterion latent variable. Values of 0.02 are considered small, 0.15 values are considered medium, and those reaching 0.35 are considered large (Kock, 2012).

Personality, EI and academic performance. In this part of the study we tested a structural model with EI as a mediator between personality and academic performance to capture the process that connects these variables and also to check the power of EI to predict academic performance, controlling for personality (see *Figure 23*). This model was tested with a sub-sample of 128 participants who reported their GPA and accounts for 16% of the variance of academic performance and all the fit indicators are in the expected range i.e., APC and ARS are both significant (APC = .177; p < .001; ARS = .345; *p* = .003) and AVIF is bellow 5 (1.603).

It should be noted that openness was removed from the model because we identified two instances of "Simpson's paradox" (i.e. the path coefficient and correlation for two pairs of variables had different signs) in the relationship between the Big Five and EI. Specifically, Openness had a positive correlation with both Inter-EI and ME, but the betas were negative. One common interpretation is that it could be an indication that the direction of these relationships is reversed, or that it is nonsensical or improbable. According to Ned Kock (personal communication, March 21, 2012), this is more likely to occur when nonlinear algorithms are used and/or full collinearity VIFs are high. Given that all full collinearity VIFs are below the 3.3 threshold and that we have no theoretical bases to believe that the relationship between Openness and both EI facets should be reversed, we assumed that their association is hypothetically nonsensical and removed Openness from the model. This decision was reinforced by the fact that when openness was included in the present mediated model the variance explained for Inter-EI and ME decreased (17% and 28%, respectively) and ARS was non significant (*p* = .073), confirming that this variable had a negative contribution to the model.

Regarding the relationship between personality and EI, results indicate that the Big Five explain almost 50% of the variance of Intra-EI (R^2 = .48) and 37% of Inter-EI and ME.

The strongest predictor is neuroticism, showing significant links with all EI components, particularly with Intra-EI (β = -.47; p < .001; f^2 = .30). Extroversion shows two significant links with Inter-EI (β = .28; p < .001; f^2 = .12) and ME (β = .23; p = .005; f^2 = .09). Agreeableness and conscientiousness show only one significant link with EI, specifically with Inter-EI (β = .21; p = .037; f^2 = .11) and ME (β = .24; p = .009; f^2 = .12), respectively.

As for the relationship with academic performance, results indicate that Intra-EI and extroversion are direct predictors of this outcome, although with small effect sizes (β = .21; p = .029; f^2 = .05 and β = -.19; p = .013; f^2 = .03, respectively). Moreover, Intra-EI fully mediates neuroticism's impact on academic performance. However, neuroticism's isolated indirect (via Intra-EI) and total effects (direct and via Intra-EI) on academic performance are small (f^2 = .03 and .06, respectively) and marginally significant (p = .049 and p = .045, respectively).   Overall, academic performance is directly explained by Intra-EI and extroversion, and indirectly by neuroticism, via Intra-EI, although with small effect sizes.
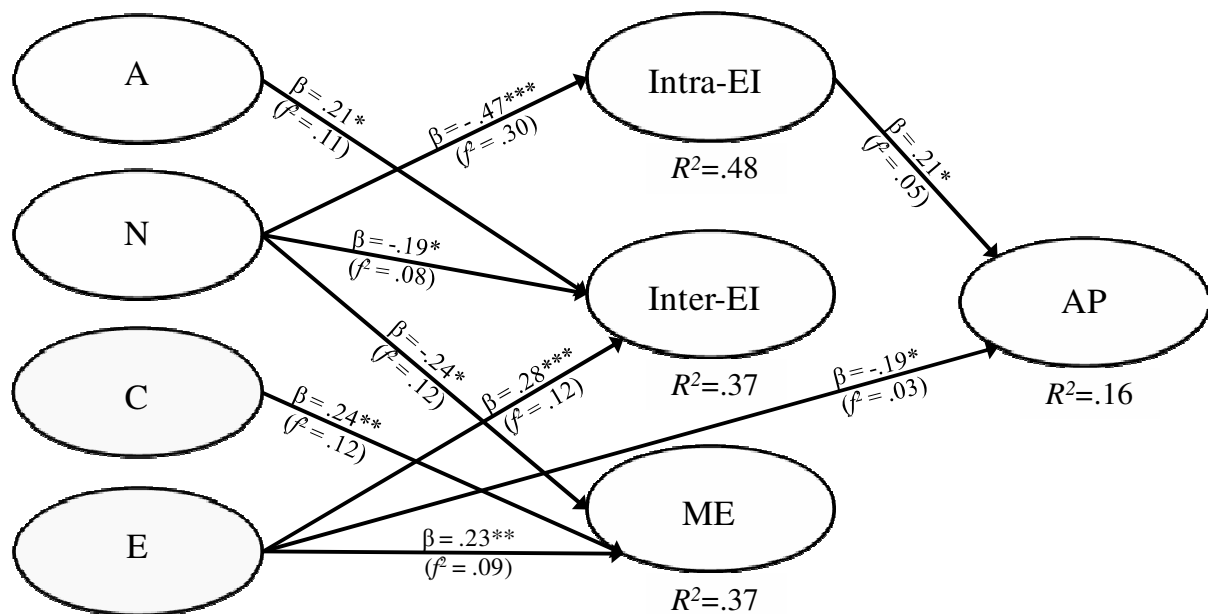
Figure 23. Mediated model with significant paths to Academic Performance.

Note. N = Neuroticism; A = Agreeableness; C = Conscientiousness; E = Extroversion; Intra-EI = Intrapersonal Emotional Intelligence; Inter-EI = Interpersonal Emotional Intelligence; ME = Mobilization of Emotions; AP = Academic performance.
* p < .05; ** p < .01; *** p < .001

Finally, it is noteworthy that all the relationships among the variables in this model are nonlinear. For example, the link between Intra-EI and academic performance takes the form of an *S*-curve, showing an optimal level at approximately 1SD above the mean and declining

afterwards (Figure 24). The link between extroversion and academic performance takes a similar form, but with a slight negative slope, declining mostly after 1 SD above the mean (*Figure 25*). In this case, the optimal point seems to be situated between 3 and 2 SDs bellow the mean.

Figure 24. S-curved relationship between Intra-EI and academic performance.

Note. Standardized values; GPA = Grade Point Average; Intra-EI = Intrapersonal Emotional Intelligence

Figure 25. S-curved relationship between extroversion and academic performance.

Note. Standardized values; GPA = Grade Point Average; E = extroversion.
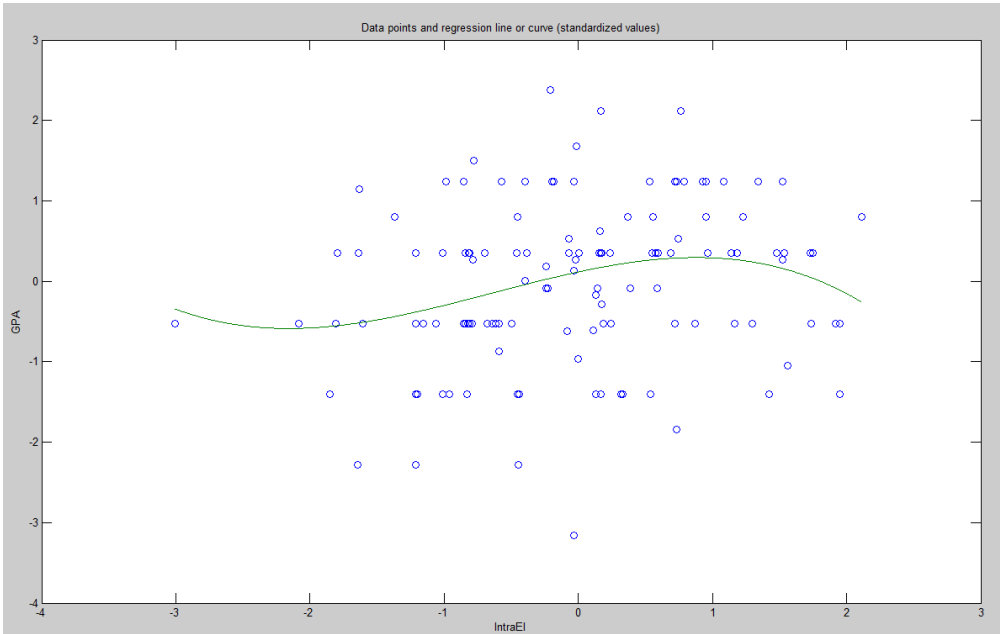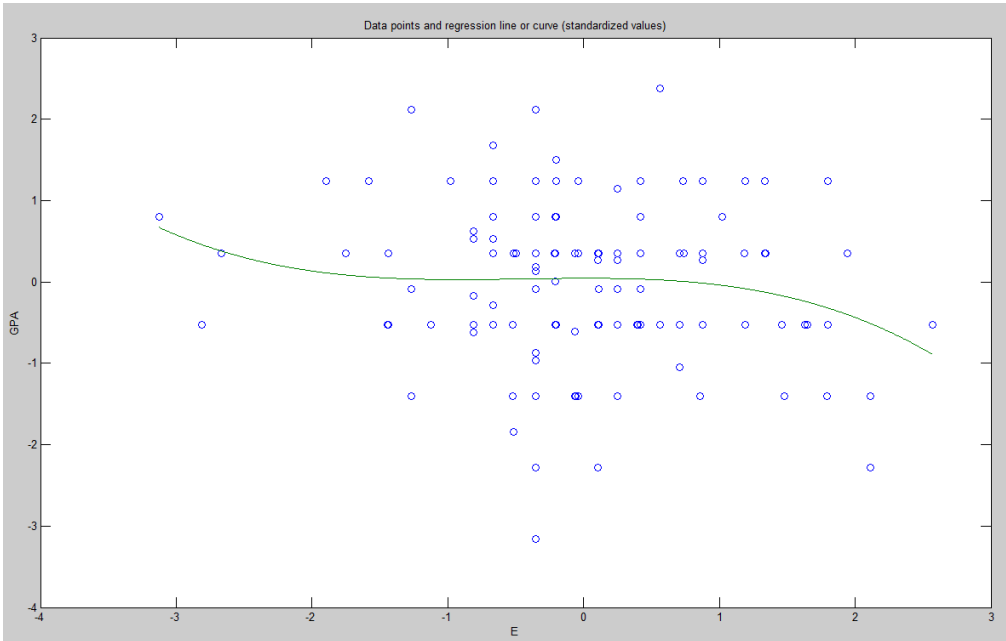
Additionally, we performed the linear regression provided by the software in order to compare the findings from both linear and nonlinear approaches. In contrast with the results obtained with WarpPLS, the PLS linear regression did not show significant paths between Intra-EI and academic performance, between agreeableness and Inter-EI, and between neuroticism and both Inter-EI and ME. Moreover, the variance explained in all variables is lower ($R^2 = .45$ for Intra-EI; $R^2 = .29$ for Inter-EI and ME, and $R^2 = .09$ for academic performance). Therefore, the linear approach captures fewer relationships among the variables, missing the meditational role of EI and accounting for less variance in the model.

Personality, EI and subjective well-being. In this part of the study we tested a structural model with EI as a mediator between personality and subjective well-being to capture the process that connects these variables and also to check the power of EI to predict subjective well-being, controlling for personality (see *Figure 26*). This model accounts for 23% of positive emotions and 28% of negative emotions' variance, having all the fit indicators in the expected range i.e., APC and ARS are significant (APC = .166; p < .001; ARS = .327; p < .001) and AVIF is bellow 5 (1.722). Again, openness was removed from the model because of the "Simpson's paradox" found in the relationship between this variable and both Inter-EI and ME. When openness was included in the model the variance explained in all variables decreased ($R^2 = .22$ for Inter-EI; $R^2 = .33$ for ME; $R^2 = .16$ for positive emotions; $R^2 = .25$ for negative emotions) except for Intra-EI ($R^2 = .49$), confirming that this variable has a negative contribution to the model.

Regarding the relationship between personality and EI, results indicate that the Big Five explain almost 50% of the variance of Intra-EI ($R^2 = .47$), 31% of Inter-EI and 34% of ME. The strongest predictor is neuroticism, showing significant links with all EI components, particularly with Intra-EI ($\beta = -.47$; $p < .001$; $f^2 = .30$). Extroversion shows two significant links with Inter-EI ($\beta = .26$; $p < .001$; $f^2 = .10$) and ME ($\beta = .20$; $p = .009$; $f^2 = .06$). Conscientiousness also shows two significant links with Intra-EI ($\beta = .18$; $p = .037$; $f^2 = .08$) and ME ($\beta = .26$; $p = .003$; $f^2 = .12$). These results are very similar to those obtained with the sub-sample in the previous model, except for agreeableness which does not show any significant links and for conscientiousness which also shows a significant link with Intra-EI.

Regarding the relationship with subjective well-being, results indicate that neuroticism and all EI facets directly predict this outcome, but while neuroticism predicts both positive and negative emotions, each EI facet connects with only one of these variables. Specifically, ME predicts positive emotions ($\beta = .23$; $p = .041$; $f^2 = .09$), whereas Intra-EI and Inter-EI

predict negative emotions (β = -.25; p = .017; f^2 = .11 and β = -.20; p = .024; f^2 = .06, respectively).

Concerning the indirect effects of personality on subjective well-being, neuroticism is the only one that shows significant overall total effects on both positive (β = -.40; p < .001) and negative emotions (β = .47; p < .001), with medium effect sizes (f^2 = .17 and .24, respectively). The same is true for the isolated total effects via each of the three components of EI. The isolated total effect of neuroticism on positive emotions via ME is significant with a medium effect size (β = -.36; p = .003; f^2 = .16). The isolated total effects of neuroticism on negative emotions via Intra-EI and via Inter-EI are also significant with medium effect sizes (β = .37; p < .001; f^2 = .19 and β = .32; p = .002; f^2 = .16, respectively).

As for the isolated indirect effects, only neuroticism and extroversion showed significant results. The isolated indirect effects of neuroticism on negative emotions via Intra-EI and via Inter-EI are significant, but with small effect sizes (β = .12; p = .025; f^2 = .06 and β = .06; p = .048; f^2 = .03, respectively). The isolated indirect effects of extroversion on negative emotions via Inter-EI is also significant, but with a small effect size (β = -.05; p = .044; f^2 = .02).

In sum, among the Big Five, neuroticism's relationship with subjective well-being is stronger and partially mediated by EI, while the extroversion link with negative emotions is smaller and fully mediated by Inter-EI. Overall, subjective well-being is explained by personality and EI. Both positive and negative emotions are directly explained by neuroticism and specific components of EI, and also indirectly by neuroticism and extroversion, via EI, although with small effect sizes. In other words EI seems to be a relevant mechanism to explain the relationship between personality and subjective well-being.
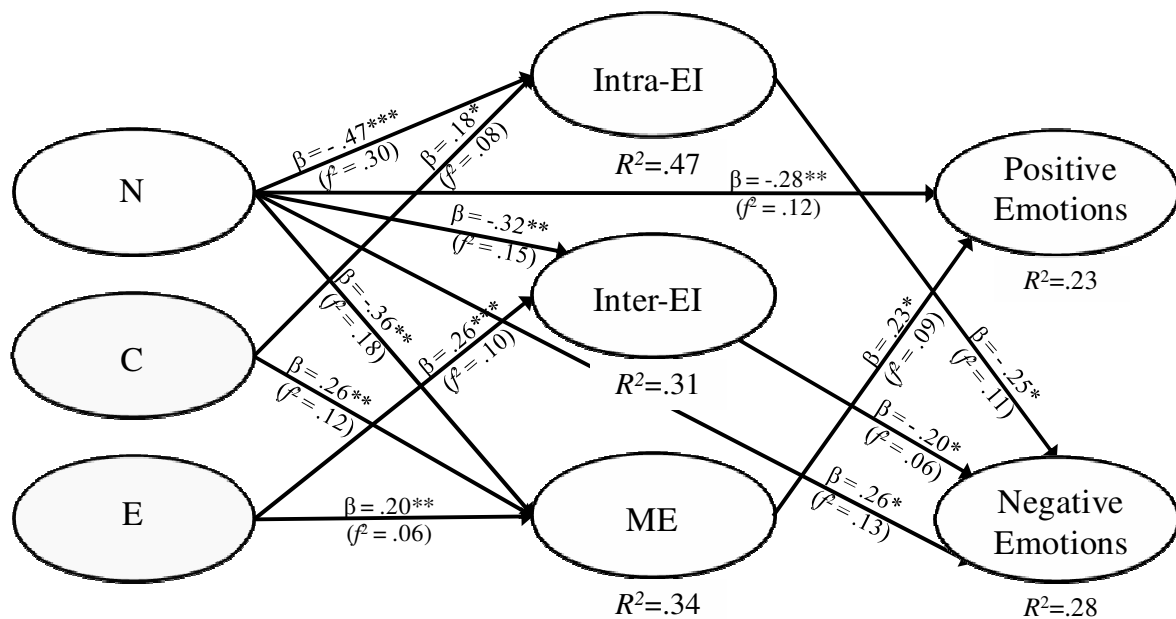
Figure 26. Mediated model with significant paths to Well-being.

Note. N = Neuroticism; C = Conscientiousness; E = Extroversion; Intra-EI = Intrapersonal Emotional Intelligence; Inter-EI = Interpersonal Emotional Intelligence; ME = Mobilization of Emotions. For simplicity reasons, agreeableness is not represented in this model as it did not show any significant links.
* p < .05; ** p < .01; *** p < .001

Finally, all the relationships among the variables in this model are also nonlinear. For example, the effect of neuroticism on positive emotions resembles an inverse-*S*, with a slight negative slope (Figure 27). On the other hand, the effect of neuroticism on negative emotions takes a similar form, but with a positive slope and an increasing rate. The effect of Intra-EI on negative emotions takes the form of an *S*-curve with a negative slope (Figure 28), while the effect of ME on positive emotions looks similar, but with a slightly positive slope.

As for the relationships between personality and EI, results showed that the effect of neuroticism on Intra-EI takes the form of a distended *S*-curve with a clear negative slope (Figure 29), while the relationship between neuroticism and both Inter-EI and ME looks more like a *U*-curve (Figure 30). Conscientiousness' relationship with ME takes the form of an *S*-curve, with a peak at about 1.5 SD above the mean, while its relationship with Intra-EI looks almost linear up to 1SD above the mean. Extroversion's relationship with Inter-EI and ME resembles a *U*-curve with the turning point at about 1 SD below the mean, in both cases.
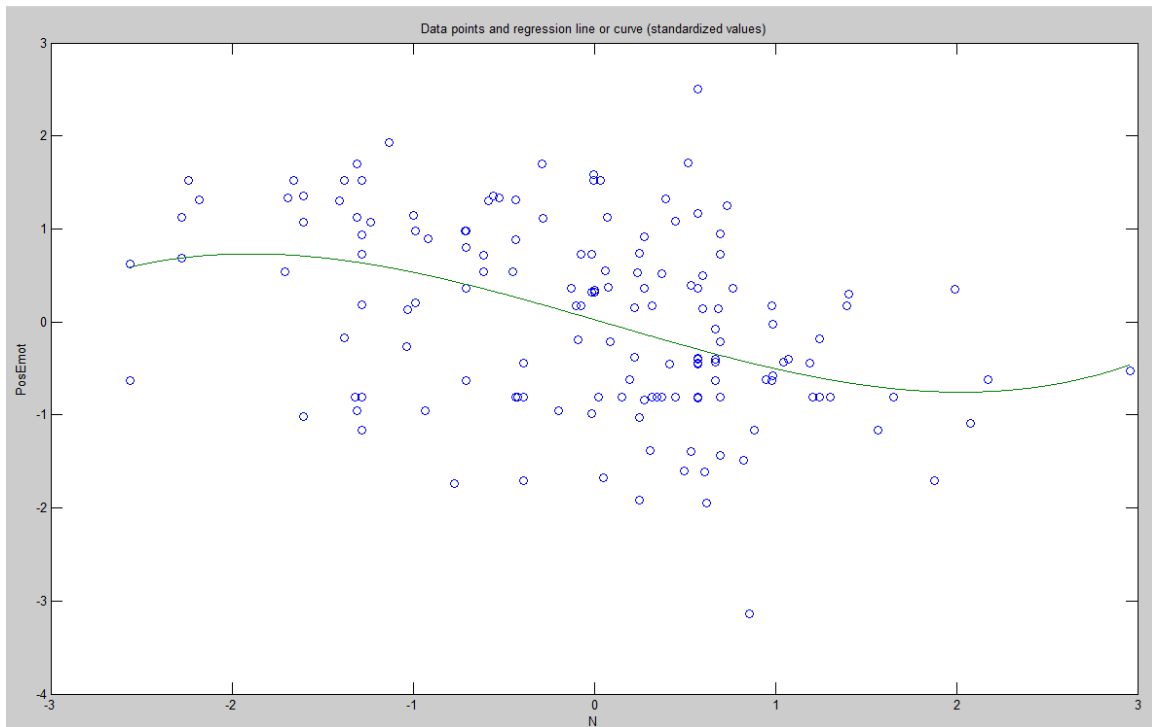
Figure 27. Inverse-*S*- relationship between neuroticism and positive emotions.

Note. Standardized values; PosEmot = positive emotions; N = neuroticism.
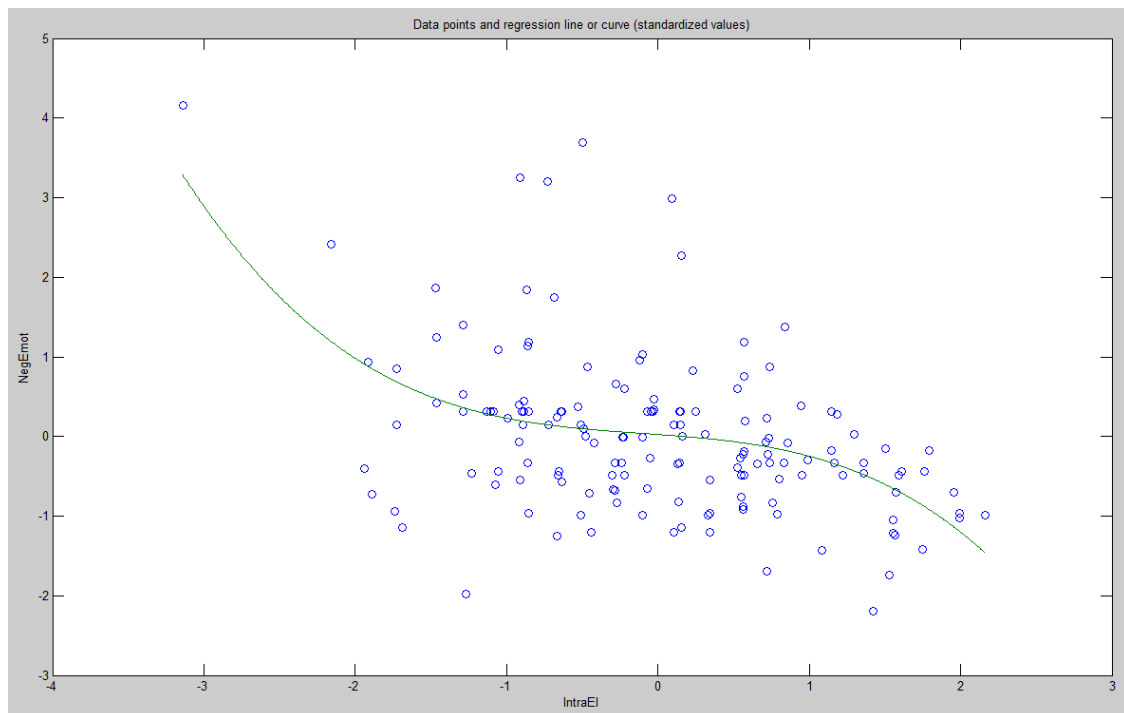
Figure 28. S-curved relationship between Intra-EI and negative emotions.

Note. Standardized values; NegEmot = negative emotions; Intra-EI = Intrapersonal Emotional Intelligence.

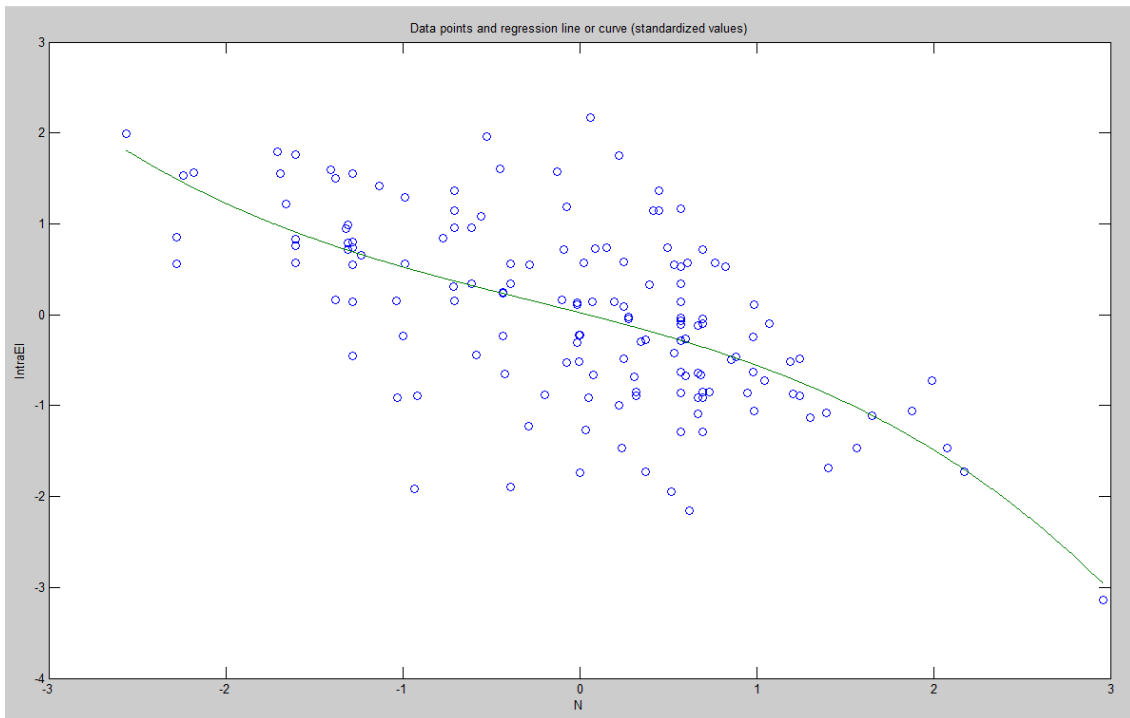*Figure 29. S*-curved relationship between neuroticism and Intra-EI.

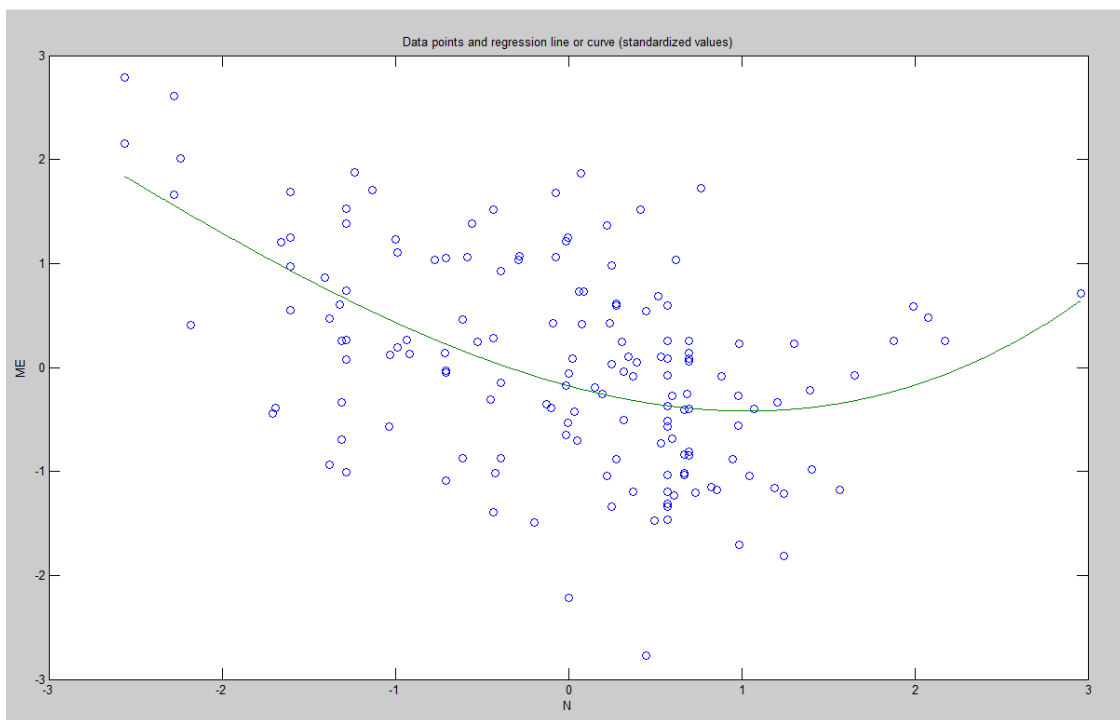*Note*. Standardized values; N = neuroticism; Intra-EI = Intrapersonal Emotional Intelligence.

Figure 30. U-curved relationship between neuroticism and ME.

Note. Standardized values; N = neuroticism; ME = Mobilization of emotions.

In contrast with the results obtained using WarpPLS, the additional linear regression analysis performed with this model did not show the previously found significant paths between Inter-EI and negative emotions, and between conscientiousness and Intra-EI. However, two significant paths emerged between agreeableness and Intra-EI (β = .19; p = .04) and between conscientiousness and Inter-EI (β = .21; p = .02), although having small effect-sizes (f^2 = .10 and .07, respectively).

Moreover, the explained variance was also slightly lower for all variables, except for positive emotions, which did not change (R^2 = .43 for Intra-EI; R^2 = .29 for Inter-EI; R^2 = .30 for ME and R^2 = .26 for negative emotions). Therefore, the linear approach captured a slightly different pattern of relationships among the variables, missing the meditational role of Inter-EI and accounting for less variance in the model.

4.2.4 Discussion

The purpose of this study was to contribute to the development of trait EI research in three main ways: (1) by moving beyond isolated direct effects and examining EI's role as a mediator in the processes that link personality to both GPA and subjective well-being; (2) by analysing EI's specific facets effects, instead of simply looking at its global effect, and (3) by exploring nonlinear relationships among these variables.

Results indicated that personality explained considerable variance in trait EI, especially in the intrapersonal dimension. However, EI still accounted for additional variance in the criteria variables. Moreover, including EI as a mediator uncovered important indirect paths linking personality to both outcomes. Finally, results revealed curvilinear relationships between all the variables, expanding previous research from linear based techniques and reinforcing the importance of studying likely moderators and mediators.

Personality and EI

Regarding the relationship between the Big Five and EI, our results are similar to those obtained with two Dutch samples (Petrides et al., 2010), and with North American and British samples (Vernon, Villani, Schermer, & Petrides, 2008). As in the present study, neuroticism was the strongest correlate of trait EI and most of the remaining Big Five dimensions contributed significantly and independently to the prediction of EI. In Petrides et al. (2010) and Vernon, Villani, Schermer, and Petrides (2008) studies, neuroticism had the largest independent contribution (β = -.39 and -.45, respectively), whereas agreeableness had the smallest (β = .13 and .10, respectively). Also, regression analyses revealed that the overlap between trait EI and the higher-order personality dimensions exceeds 50%, even when the

constructs are operationalized via shortened assessments. The authors concluded that these results were fully in line with trait EI theory, which views the construct as encompassing the emotion-related aspects of personality, many of which have been conceptualized as constituent facets of the basic dimensions of neuroticism and extraversion.

Taken together, these studies replicated previous findings that trait EI and the Big Five dimensions overlap considerably (e.g., Freudenthaler et al., 2008; Greven et al., 2008; Mikolajczak, Luminet, Leroy, & Roy, 2007; Vernon et al., 2009). However, this association was generally quantified via multiple linear regression analyses. Conversely, we used a nonparametric approach with latent variables, having the advantage of allowing for nonlinear relationships. Moreover, our study did not measure EI as a single block, but instead analysed relationships at the facet level, allowing for more detailed conclusions. For example, the finding that the 50% "overlap" between personality and EI is mostly related to the link between neuroticism and the intrapersonal facet of EI adds to the current literature, given that previous studies have generally reported results at the global level of EI. It is also interesting to know that extroversion and conscientiousness show different patterns of relationship with the different facets of EI (e.g., while extroversion does not relate to Intra-EI, conscientiousness does not relate to Inter-EI).

Personality, EI and Academic Performance

Regarding the association between personality and academic performance, like Cucina and Vasilopoulos (2005) we obtained significant curvilinear relationships between openness and academic performance, but contrary to their study we did not find a significant link with conscientiousness. This is also dissonant with recent meta-analyses (Poropat, 2009; Richardson et al., 2012) showing that conscientiousness is the strongest correlate of academic performance.

Saklofske, Austin, Mastoras, Beaton, & Osborne (2012) also found non-significant association between these variables, but when EI was combined with coping, conscientiousness became a significant indirect predictor of year mark, via this higher-order composite factor, named task focus (a combination of the largest loadings of EQ-i adaptability subscale and task-oriented coping). In a longitudinal study, Caprara, Vecchione, Alessandri, Gerbino, & Barbaranelli (2011) reported as well that conscientiousness did not contribute directly to high school grades, but instead this link was mediated by academic self-efficacy. Although, this study did not include EI, a previous study by Adeyemo (2007) found support for EI as moderator of the link between academic self-efficacy and academic performance. This raises the possibility that EI or one of its facets is a full mediator in the conscientiousness

- academic performance link, either alone or combined with other factors. However, in our study this was not the case, because only neuroticism significantly influenced GPA via intrapersonal EI, which fully mediated this relationship.

One possible explanation for the absence of significant results regarding conscientiousness lies in the specificity of the sample. Given that participants come from a military organization it is likely that they were already highly selected for their level of conscientiousness upon admission, due to the armed forces demands in this regard. This may have diminished the variability of results, causing a range restriction and preventing the possibility of finding significant links with other variables. Indeed, this variable had one of the highest means (together with agreeableness) and only 1% of the participants picked the two lower points of the scale, in contrast with 38 % who selected the two highest points of the scale. Another possibility is that the influence of an unmeasured method factor, such as socially desirable responding, could be masking the predictive validity of conscientiousness (Biderman, Nguyen, Cunningham, & Ghorbani, 2011).

Regarding the association between EI and academic performance, our results are in line with the important meta-analytic finding that EI also has a significant influence on academic performance, besides the Big Five personality factors (Richardson et al., 2012). Moreover, our results compare favourably to those obtained in two meta-analyses: whereas Van Rooy and Viswesvaran (2004) and Richardson et al. (2012) reported an overall mean corrected correlation of .10 and .17, respectively, we obtained a .20 significant correlation between Intra-EI and GPA. Nevertheless, these results are not directly comparable, because the referred meta-analyses did not separate the ability from the trait approaches, and only examined EI as a whole. Using a multidimensional trait EI measure we were able to identify not only which EI facet had a significant association with GPA, but also that this facet explains significant variance in academic performance even in the presence of the Big Five personality factors, contributing with a slightly higher effect-size ($f^2 = .05$) to that of extroversion ($f^2 = .03$). Moreover, the mediated model revealed that neuroticism also influences GPA via intrapersonal EI, which fully mediates this relationship. Therefore, neuroticism is an indirect predictor of academic performance, being intra-EI a more proximal antecedent or the mechanism that explains the link between these variables.

Personality, EI and subjective well-being

Regarding the relationship between the Big Five and subjective well-being, our results have some similarities with Huppert's (2009) conclusions, who found significant and stronger links between extraversion and positive emotions ($\beta = .27$), and between neuroticism and

negative emotions (β = .41). A previous meta-analysis (Steel, Schmidt, & Shultz, 2008) also found that neuroticism was the strongest predictor of negative affect (β = .52 for the NEO inventory, β = .56 for the EPQ and β = .46 for the EPI) and that extroversion was strongly associated with positive affect (β = .33 for the NEO Inventory, β = .30 for the EPQ and β = .23 for the EPI). Overall, these findings suggest that extraversion is strongly associated with a positive emotional outlook (but not with psychological ill-being) and neuroticism is associated with a negative emotional outlook (but not with psychological well-being).

Although this was not exactly the case in our study, as neuroticism influenced both well-being and ill-being and extroversion only had a small indirect influence on negative emotions, a similar pattern emerged with EI. Specifically, ME seems to drive positive emotional states, but it does not appear to influence psychological ill-being. On the other hand, Intra-EI and Inter-EI seem to impact negative emotional states, but they do not appear to influence psychological well-being. Overall, these results are congruent with the idea that well-being and ill-being are best conceived as separate, independent dimensions of mental health, instead of the extremes of a continuum (Ryff et al., 2006). Therefore, the factors contributing to mental health or well-being are not necessarily the same as those which influence ill-being.

Regarding the mediated model, our results are slightly different from those of Greven et al. (2008). Using SEM analysis they found that: (1) trait EI fully mediated the paths from extraversion, openness, agreeableness and conscientiousness to general health; (2) partially mediated the link between neuroticism and general health. Nevertheless, there are important differences in the design of both studies, which might account for some of the divergent results. First, we used subjective well-being and not general health as the criterion variable. Second, we used a different instrument to operationalize EI. As noted by Zeidner et al. (2012), the measure used in Greven's et al. study (TEIQue) includes a well-being scale and its correlations with mental health reflect content overlap. Indeed, after re-analysing Greven's et al. data they found that only the well-being scale had incremental validity over the Big Five. Finally, we analysed specific relationships with the different facets of EI and not with a general score of EI. Therefore, results are not directly comparable and we cannot ascertain if differences in the results are due to the statistical methodology.

Overall Analysis

Overall, it is interesting to note the different patterns of association of EI and the Big Five with academic performance and subjective well-being. Although only intra-EI seems to

be an important proximal link in both cases, the other two facets of EI are also relevant predictors of subjective well-being (with different patterns for positive and negative affect). Moreover, the fact that Inter-EI and ME have different patterns of association with subjective well-being reinforces the idea that these facets of EI are distinct, although highly correlated. Regarding personality, while extroversion is only a direct predictor of academic performance and only an indirect one in the case of subjective well-being, neuroticism is a direct (and indirect) predictor of subjective well-being, while extroversion is only an indirect one. This reversed pattern is an interesting finding that we believe to contribute to the extant literature.

Finally, it is noteworthy that all the examined relationships in this study are curvilinear. Therefore, we cannot make simplistic interpretations such as "the more the better", when links are positive, or "the less the worst" when they are negative. For example, the *S*-shaped relationship found between Intra-EI and academic performance revealed that intermediate levels of this facet of EI are desirable for good academic results and that high or low Intra-EI have a negative impact on academic performance (being the optimal level at about 1SD above the mean). On the other hand, the slightly negative *S*-shaped relationship link found between extroversion and academic performance showed that being introverted (around 3 or 2 SDs bellow the mean) pays off. In contrast, after 1SD above the mean the relationship declines as the level of extroversion increases. This result extends previous findings reporting negative linear effects of extroversion on GPA (e.g., Richardson et al., 2012), revealing that it is mainly at high levels of extroversion that there is a negative impact on academic performance and that there is an optimal level of extroversion in order to improve academic results.

As for subjective well-being, the negative *S*-curved link obtained between neuroticism and positive emotions indicates that well-being increases as neuroticism decreases (with an optimal level about 2 SDs bellow the mean). The reverse pattern was found for the relationship between ME and positive emotions (with an optimal level about 2 SDs above the mean). On the other hand, the positive *S*-curved link obtained between neuroticism and negative emotions indicates that ill-being increases as neuroticism increases. The reverse pattern was found for the relationship between Intra-EI and negative emotions (and also for the relationship between Inter-EI and negative emotions).

Therefore, it seems that each construct – personality and EI – has different patterns of relationship with both outcomes (academic performance and subjective well-being), making them distinct in this respect. In our view, this new finding is potentially an interesting contribution to the extant literature in the area of EI and personality.

Overall, we believe this study offers new insights to the research field of trait EI. First, it provides evidence in support of its ability to predict important criteria, such as GPA and subjective well-being over and above personality traits (e.g., Big Five) thus ruling out Zeidner's et al. (2012) caveat on a possible confusion. Secondly, it supports the conceptualization of EI as a lower-order trait (Petrides, Pita & Kokkinaki, 2007), which mediates the impact of higher-order traits (Big Five) on important life criteria, thus reinforcing Greven's et al., (2008) findings. Finally, it represents an attempt to investigate nonlinear relationships in this area and opens a new window of investigation. This seems particularly relevant as none of them were linear and when tested with a linear approach several relevant paths were not captured, lowering the models' explained variance.

However, the evidence obtained here has some important limitations that should be taken into consideration in future studies. First, it is restricted to two criteria (GPA and subjective well-being) and a very specific organizational context (military), comprising mostly men. Therefore, it is essential to replicate these results with other outcomes and with more gender balanced samples, from different contexts. Future studies could also include other indicators of academic success, such as retention and/or drop-out rates.

Secondly, the data for antecedent and consequent variables was collected at the same point in time and the measures were all self-reported. Although academic performance was self-reported, meta-analytic findings from Kuncel, Crede, and Thomas (2005) found a high correlation with actual grades (mean r = .90 for college students; N = 12 089, k = 12). Nevertheless, it is important to replicate and extend these findings with more objective criteria and with multiple-wave studies to test real causal paths. For example, Zeidner and Olnick-Shemesh (2010) used a prospective design to analyse the predictive power of ability EI on subjective well-being with a four-month interval between the measurement of predictors and criteria variables. Overall, the MSCEIT failed to show significant correlations with subjective well-being, even without controlling for ability and personality variables. In order to check whether this resulted from the design or from the measure used it would be of major interest to replicate this kind of study either with a different methodological apparatus or with a trait measure of EI.

Another concern is the non-significant relationship between conscientiousness and academic performance. This could be due to using a short measure of Big Five which clearly presents practical advantages but can introduce unaccounted measurement errors. Using a larger version might improve reliability and explained variance, besides allowing the analysis of the relationships at the facet level, for instance. Nevertheless, Saklofske et al. (2012) were

also unable to find a significant link between conscientiousness and academic performance, although using a 40-item scale.

It would also be interesting to test these links with a more established measure of trait EI, at the facet level (instead of the global score), to find out if other patterns would emerge. Nevertheless, results would not be easily comparable, because the sub-scales would differ. Finally, future studies could extend these findings by investigating potential moderator effects of these relationships (e.g., culture, gender). Examining more complex relationships would significantly advance research in this area, by clarifying not only the mechanisms by which EI influences GPA and subjective well-being, but also the contexts in which they occur.

Summary and conclusions

In this chapter we aimed to discuss the implications of EI to the individual in two important domains: health and academic success. We started by presenting the findings of our meta-analysis regarding the relationships between EI and health. This study corroborated that there is a significant link between these variables, especially in the case of trait EI and that no additional studies are needed to support it. However, being a summary of correlational studies it does not prove causal relationships. Moreover, it does not take into account other competing variables, such as personality and cognitive ability. Therefore, in the subsequent study we decided to move forward and use structural equations modelling to test causal links between EI and two important outcomes for individuals in the academic context: performance and well-being.

Furthermore, as we have seen, researchers are starting to shift attention from the mere statistical analysis of incremental validity to the inspection of the role of EI as a mediator in the processes that link higher-order variables to their outcomes. Indeed, the examination of mediated models is crucial to broaden our understanding of the processes where EI is involved. Therefore, we also included personality as an antecedent variable in order to account for its influence both in EI (measured as a trait) and in the final outcomes. This allowed us to find that although personality explains significant variance in EI they are not redundant. Instead, EI seems to be an important mechanism that explains the link between personality and both academic performance and well-being. Finally, we used a nonlinear technique to better capture more realistic relationships among these variables and explain more variance. This seems to be an important and new contribution to the extant findings in this area of research. Therefore, in the next chapter we will further explore this mediated and nonlinear approach with other variables more relevant to the organization.

Chapter 5 – Implications for Organizations

"Business seems to be enamoured by the construct of emotional intelligence"

(Jordan, Murray, & Lawrence, 2009)

According to Jordan et al. (2009) it is in the area of business that EI grew fast in popularity, probably due to the managers' desire to find new ways to improve performance and to better predict behaviour in the workplace. This is in line with the practitioner's "get it moving" culture that was discussed in the introduction (Murphy & Sideman, 2006).

From the literature review we identified two key topics that have received the lion's share of attention in this research domain: performance and leadership. Work attitudes, such as job satisfaction, work engagement or organizational commitment have received less attention from researchers. In the following sections we summarize the relevant literature on EI regarding its predictive power in performance, leadership, work engagement and organizational commitment, and also present the findings of our studies in these domains.

5.1 EI and Job Performance

There are currently three meta-analysis available in the literature dedicated to the relationship between EI and performance (Joseph & Newman, 2010a; O'Boyle et al., 2010; Van Rooy & Viswesvaran, 2004). The first effort to summarize research in this area was done by Van Rooy and Viswesvaran (2004), who found that overall EI had a predictive validity of .23 (k = 59, N = 9522) for performance in general (see Table 19) and .24 for performance in work settings, in particular (k =19, N = 2652). They also found that EI predicted academic performance (e.g., GPA) and life performance in general (e.g., sports and health), at .10 (k = 11, N = 1,370) and .24 (k = 34, N = 6327), respectively. Although this meta-analysis combined all studies and did not examine separately the two ways of measuring EI (ability and trait), the authors presented results for each instrument, showing that the MEIS had the lowest predictive power (.19) and the TMMS had the highest (.32). The SEIS was the second best predictor (.25), followed by the ECI (.22) and the EQ-i (.20). Regarding the criterion measurement method, results revealed that the use of ratings yielded a higher validity (.26) in contrast to the use of organizational records (.14), but supervisor and self-ratings had comparable validities (.25 and .27, respectively). Additionally, although EI added a minimal incremental validity over GMA (.02), it explained a more substantial variance over the Big Five, ranging from .06 for conscientiousness to .29 for openness (see Table 20). Curiously, the

Big Five did not show incremental validity over EI, leading the authors to suggest that it is possible that EI is a better predictor of performance than the Big Five. Nevertheless, they concluded that the alleged importance of EI over cognitive ability (e.g., Goleman, 1995) is actually not supported by evidence.

A more recent meta-analysis by Joseph and Newman (2010a) based on a larger sample (k = 26, N = 2832) and which included only studies with job performance as criteria, corroborated these general tendencies, examining different kinds of EI measures separately. Moreover, this review revealed an interesting moderator variable: emotional labour. Ability EI (stream 1) correlated at .18 with job performance, but this value was superior for high emotional labour jobs (.24) than for low emotional labour jobs (.01), which did not even reach significance (see Table 19). For self-reported EI, these values were higher, but the patterns were similar: .23, .28 and .20, respectively for self-reported ability EI (stream 2) and .47, .59 and .43, respectively for mixed-model self-reports (stream 3). Finally, all types of EI measures showed incremental validity for jobs with high emotional labour controlling for personality and cognitive ability. Nevertheless, stream 3 measures showed more incremental validity in high emotional labour jobs (19.6%) than stream 2 measures (7.8%) and stream 1 measures (1.5%). When emotional labour was not considered, only stream 2 and 3 measures showed incremental validity over and above both traditional predictors (2.3% and 14.2%, respectively), as seen in Table 20.

O'Boyle et al. (2010) performed the most updated meta-analysis in this domain with 65% more studies (43 effect sizes relating EI to job performance) and over twice the sample size (5795 for job performance) of the previous one (which was based on research presented at a 2007 conference, according to the authors). This fresh review revealed that the overall relation between EI and job performance is .28 and that all three streams of EI predicted job performance at about equivalent levels (.24 for ability EI, .30 for self-reported ability EI and .28 for mixed-model self-reports), as shown in Table 19. However, after controlling for the Big Five and cognitive ability, only the self-reported EI measures (both based on ability and mixed models) added significant incremental variance (5.2% and 6.8%, respectively). Although these findings do not seem very encouraging, the authors also performed a relative dominance analysis, which is more suitable for correlated predictors than the traditional hierarchical regression tests. These results showed that the relative importance of the different EI measures was much higher than previously found: 6.4% for EI ability measures (stream 1), 13.6% for self-reported ability EI (stream 2) and 13.2% for mixed-model self-reported EI (stream 3), as seen in Table 20. The remaining variance in job performance was, as expected,

mainly explained by cognitive ability (from 69% in stream 3 to 73.5% in stream 1) and conscientiousness (from 10.2% in stream 3 to 12.8% in stream 1). The relative importance of the other Big Five traits was much lower (ranging from .8% for Agreeableness to 4.3% for Openness, in stream 3). Moreover, Conscientiousness is only more relevant than EI within stream 1. When EI is measured with trait like questionnaires (streams 2 and 3) it becomes the second best predictor after cognitive ability (13.6% in stream 2 and 13.2% in stream 3).

Table 19. *Summary of EI's Predictive Validity in Work Performance*

Research stream	Meta-analysis					
	2004	2010a	2010b	Mean	2010a	
					High EL	Low EL
Stream 1	0,19	0,18	0,24	0,20	0,26	0,01
Stream 2	0,29	0,23	0,30	0,27	0,28	0,20
Stream 3	0,22	0,47	0,28	0,32	0,59	0,43
Overall EI	0,23	0,32	0,28	0,28		

Note. Stream 1 = ability model/performance measure; Stream 2 = ability model/self-report measure; Stream 3 = mixed or trait model/ self-report measure; 2004 = Van Rooy & Viswevaran (2004); 2010a = Joseph & Newman (2010); 2010b = O'Boyle et al. (2010); In the 2004 study Stream 1 is represented by the MEIS, Stream 2 by the SEIS and Stream 3 by the ECI and EQ-i.

Table 20. *Summary of EI's Incremental Validity in Work Performance*

Research stream		Meta-analysis				
	2004	2010a			2010b	
		ΔR^2 (Big5)	ΔR^2 (GMA)	ΔR^2 (GMA+Big5)	ΔR^2 (GMA+Big5)	% of R^2 (GMA+Big5)
Stream 1		1,5%	0,7%	0,0%	0,4%	6,4%
Stream 2		1,7%	4,8%	2,3%	5,2%	13,6%
Stream 3		15,7%	14,9%	14,2%	6,8%	13,2%
ΔR^2 (GMA)	2,0%					
ΔR^2 (Big5)[a]	[6% - 29%]					

Note. Stream 1 = ability model/performance measure; Stream 2 = ability model/self-report measure; Stream 3 = mixed or trait model/ self-report measure; 2004 = Van Rooy & Viswevaran (2004); 2010a = Joseph & Newman (2010); 2010b = O'Boyle et al. (2010); ΔR^2 = incremental validity; % of R^2 = relative % of variance explained (dominance analysis); Big5 = Big Five personality factors; GMA = General Mental Ability; [a] = compared to each trait individually (not to the whole Big Five set)

A summary of the most important findings of these three meta-analyses is displayed in Table 19 for predictive validity and Table 20 for incremental validity. Overall, although EI is not a better predictor of job performance than cognitive ability, as some popular authors claimed, it explains additional variance over and above traditional cognitive and personality factors, especially in the case of self-reported EI. Therefore, this goes against the idea that EI is no more than "old wine in new bottles". This is especially true if we take into consideration that controlling for both intelligence and personality at the same time is a rather harsh test for the survival of any new construct in this area. In our view, it makes more sense to control for intelligence when using ability measures of EI or, alternatively, to control for personality when using self-report measures of EI, given the similarity of the measurement method and, consequently, the higher risk of overlap. In either case, the incremental validity is more promising, although more advantageous for streams 2 and 3, where EI self-reports seem to add more to personality (1.7% to 15.7%), as compared to the added value of EI ability measures relative to cognitive ability (0.7%). Overall, although stream 3 measures seem to better predict job performance, the dominance analysis performed by O'Boyle et al. (2010) revealed that stream 2 measures explain a higher percentage of the variance, as seen in Table 20. This is an interesting finding since stream 3 measures are usually more comprehensive and extensive than stream 2 measures, which are based on the original ability model of EI.

5.2 EI and Leadership

Although the meta-analysis by O'Boyle et al. (2010) found EI to relate to job performance over and above cognitive ability and personality, leadership studies still need to better attend to incremental validity. A very recent review (Walter et al., 2011) revealed that only one published paper out of 38 has controlled for both cognitive ability and personality, leaving open the possibility of alternative explanations. Within the area of leadership emergence, all published papers (6 studies) supported the idea that emotionally intelligent individuals are more likely to emerge as leaders (see Table 21). Results regarding leadership behaviour based on 16 papers were contradictory. Although most studies using self-reported EI positively related it to transformational leadership, one of them (Lindebaum & Cartwright, 2010) found a significant relationship only if both constructs were measured using the same source (self, peers, or supervisors). Finally, most of the studies analysing the link between EI and leader effectiveness (11 out of 16) supported a significant and positive relationship.

Overall, these studies support the value of EI for leadership theory and practice although models may be accused of being simplistic (overlooking possible moderators and

mediators). Until greater methodological rigor is introduced in this area of research it will be difficult to conclude if EI is really relevant and useful for leadership (Walter et al., 2011).

Table 21. *Summary of Walter's et al. (2011) Review on the EI - Leadership Link*

Research stream	Number of studies		
	Leadership emergence	Leadership behaviour	Leadership effectiveness
Stream 1	1	4	4
Stream 2	1	7	5
Stream 3	4	5	7
Total	6	16	16
Resullts			
Support	6 (100%)	9 (56%)	11 (69%)
No support		3 (19%)	2 (12%)
Partial support		4 (25%)	3 (19%)

Note. Stream 1 = ability model/performance measure; Stream 2 = ability model/self-report measure; Stream 3 = mixed or trait model/ self-report measure

In spite of the limitations identified by this review, we found a thesis that represents a good advancement in this direction. Indeed, Whitman (2009) performed a meta-analysis of 92 independent studies with sample sizes ranging from 26 to 322 leaders and found a positive moderate relationship between EI and leadership effectiveness (.25), transformational leadership (.37), and LMX - leader-member exchange (.27), summarized in Table 22. However, once personality and intelligence were accounted for, analysis revealed that EI explained around 1% or less of additional variance in leadership effectiveness (see Table 23). Nevertheless, this study had the merit of examining possible process mechanisms, showing that both transformational leadership and LMX partially mediate the EI-leadership effectiveness relationship. Another meta-analysis by Mills (2009) found a moderately strong relationship between EI and leadership effectiveness with a combined effect of r = .38 ($K = 48$ studies, 99 effect sizes and $N = 7,343$). However, this study did not distinguish between EI research streams or at least identify the instruments used to measure EI, nor did it control for any relevant variables.

Table 22. *Summary of EI's Predictive Validity in Leadership*

Research stream	Leadership outcome								
	Leadership effectiveness	K	N	Transformational Leadership	K	N	LMX	K	N
Overall EI	0.25	52	6052	0.37	38	4519	0.27	10	880
Ability EI	0.21	20	2058	0.25	12	1257	0.24	5	422
Trait EI	0.27	26	2810	0.43	28	3124	0.27	6	692
EI test									
SEIS	0.38	7	686	0.57	6	467			
ECI	0.31	6	616	0.45	4	313			
EQ-i	0.29	6	880	0.44	11	963			
WLEIS	0.19	7	661	0.36	6	995			

Note. Ability EI = MSCEIT; Trait EI = SEIS, ECI, EQ-I, WLEIS; K = number of correlations; N = total sample; LMX = leader-member exchange.

Table 23. *Summary of EI's Incremental Validity in Leadership Effectiveness*

Research stream	Leadership effectiveness					
	ΔR^2 (Big 5)	ΔR^2 (GMA)	ΔR^2 Big5+GMA	Total R^2 (Big 5+EI)	Total R^2 (GMA+EI)	Total R^2 (Big5+GMA+EI)
Overall EI	1%	4%	1%	16%	16%	16%
Ability EI	1%	2%	0%	11%	9%	13%
Trait EI	1%	6%	1%	19%	18%	19%

Note. Big5 = Big Five personality factors; GMA = General Mental Ability; ΔR^2 = incremental validity.

Another important issue concerns same-source bias. A meta-analysis (based on 62 independent samples) by Harms and Crede (2010), showed that when the ratings of both EI and leadership came from the same source the validity estimate was .59, but it decreased to .12 when these ratings were obtained from different sources (see Table 24). Trait EI measures tended to show higher validities than ability EI measures, for both same-source and multisource ratings. The EQ-i had the highest validity estimate for both methods (.67 and .20, respectively). However, both trait and ability EI measures revealed important validity decreases when multiple sources were used (e.g., from .54 to .09 for the WLEIS and from .24 to .05 for the MSCEIT). Therefore, caution is recommended when interpreting single-source studies, as results may have been magnified by common method bias. Nevertheless, as noted by the authors, the fact that the self-other agreement for both EI and leadership was quite low

(.16 and .14, respectively) does not necessarily indicate lack of validity, as different sources may simply be using different cues to make inferences.

Table 24. *Summary of EI's Predictive Validity in Transformational Leadership*

Research stream	Correlation with Transformational Leadership					
	Same source	K	N	Different source	K	N
Overall EI	0.59	47	4994	0.12	22	2661
Ability EI	0.24	10	1061	0.05	4	441
Trait EI	0.66	38	4424	0.13	20	2491
EI test						
EQ-i	0.67	6	640	0.20	4	267
WLEIS	0.54	6	564	0.09	5	1099

Note. Ability EI = MSCEIT; Trait EI = EQ-i, WLEIS, SUEIT, EIA; K = number of correlations; N = total sample.

Overall, job performance and leadership received much attention from EI researchers. These include efforts to synthesise the findings from different studies in reviews such as the ones presented above. In contrast, engagement and work attitudes such as commitment received less attention. Therefore, in the next section we will critically review the relevant literature in this area and present an empirical study to expand this research field.

5.3 EI and Work Engagement

Work engagement is a relatively new construct with over 200 scientific publications and an increasing popularity, since its first appearance in the 1990s (Schaufeli, 2012). In academia, the most well-known definition, model and measure were proposed by Schaufeli and colleagues. They define engagement as a "positive, fulfilling, and work-related state of mind that is characterized by vigour, dedication, and absorption" (Schaufeli, Salanova, González-Romá, & Bakker, 2002, p.74). Vigour means investing high levels of energy, mental resilience and effort at work, representing the behavioural component of engagement. Dedication means experiencing a sense of significance, enthusiasm, inspiration, pride, and challenge while working. This represents the emotional component of engagement. Finally, absorption means being completely concentrated and happily immersed in one's work, such that time flies and people feel carried away by their job. This represents the cognitive

component of engagement (Schaufeli, 2012). In sum, engaged employees are physically, emotionally and cognitively linked to their work (Bakker, 2011).

Schaufeli et al. (2002) also proposed the most widely used instrument to measure engagement – the Utrecht Work Engagement Scale (UWES) – which includes three subscales to assess each of the three components. This measure was validated in several countries across Europe, North America, Africa, Asia, and Australia.

Work engagement is conceptualized within the Job Demands-Resources (JD-R) model, whereby job and personal resources are considered the main predictors of engagement, which in turn leads to higher job performance. Job demands act as a moderator of the relationship between job and personal resources with engagement. High job demands have a positive impact on this relationship, mobilizing resources (Bakker, 2011). Job resources refer to physical, social or organizational aspects of the job, such as opportunities for development, performance feedback, autonomy, leadership and social support. Personal resources are positive self-evaluations that make individuals believe they can effectively deal with the situation, such as self-efficacy, hope, optimism and the ability to perceive and regulate emotions (Schaufeli, 2012).

Research substantiates that engagement is a better forecaster of performance than job satisfaction, probably because being satisfied is not the same as being enthusiastic (Schaufeli, 2012). Engagement can be conceptualized as a positive and active form of work-related well-being, whereas job satisfaction is a cognitive judgement and does not refer to motivation (Bakker, 2010; Reijseger, Schaufeli, Peeters, & Taris, 2011). A recent quantitative review by Christian, Garza, and Slaughter (2011) showed that engagement is different from job attitudes like job satisfaction, organizational commitment and job involvement, and also that it has incremental validity for task and contextual performance. Furthermore, using meta-analytic techniques, they found that engagement is a (partial) mediator between antecedents (e.g., job characteristics, leadership and personality) and job performance. However, regarding the dispositional antecedents, only conscientiousness, extraversion and proactive personality were considered. These authors do not make any direct reference to EI but they point that the "ability to control one's thoughts and emotions" is likely to lead to engagement. Moreover, Bakker, Albrecht, and Leiter (2011) suggest that organizations can develop work engagement by investing in EI training programs. Therefore, it is implied that EI may be an antecedent of engagement, among other personal resources.

Few researchers investigated the link between EI and engagement, but some evidence has already been gathered in support of this relationship. For example, based on a sample of

mental health Spanish professionals, Durán, Extremera, and Rey (2004) reported that two of the three TMMS dimensions were significantly associated with engagement: emotional clarity showed a significant link with dedication ($r = .25$) and emotional repair showed significant correlations with all engagement dimensions (.20 for vigour, .30 for dedication and .36 for absorption). With a similar kind of sample and EI measure, Extremera, Durán, and Rey (2005) found that two EI components (attention and repair) predicted dedication and absorption (explaining 16.6% and 18% of its variance, respectively), but not vigour. Another study with South African customer service workers found that EI was the best predictor of engagement, relative to emotion work and social support, explaining 20% of its variance (Jonker & Joubert, 2009).

According to Bakker (2011) recent studies suggest that engagement may also be relevant for contexts outside work, such as education and sport. Therefore, it seems important to further explore engagement in other domains, such as the academic setting. For example, Durán, Extremera, Rey, Fernández-Berrocal, and Montalbán (2006) reported positive moderate and significant relationships between EI and academic engagement, as well as incremental validity, beyond perceived stress and general self-efficacy.

Overall, most studies on the link between EI and engagement either relied on a limited proxy measure of EI (e.g., the TMMS, which only assesses the intrapersonal component of EI; see section 2.3.2) or did not control for personality factors as potential concurrent or predictor variables of EI, such as the Big Five. Therefore, the need to analyse this relationship with more comprehensive measures of EI and personality controls seems evident.

5.4 EI and Organizational Commitment

Organizational commitment has been conceptualized in different ways over the years but it is commonly agreed that it refers to an attitude towards the organization, involving feelings, beliefs and behavioural inclinations (Solinger, Van Olffen, & Roe, 2008). For more than two decades, the Allen and Meyer's (1990) three-component model has been the leading proposal in this area. This framework comprises three forms of commitment: (a) affective commitment - the "employees' emotional attachment to, identification with, and involvement in the organization"; (b) continuance commitment - the "costs that employees associate with leaving the organization"; and (c) normative commitment - the "employees' feelings of obligation to remain with the organization" (Allen & Meyer, 1990; p. 1). Simply put, in the first case individuals stay in the organization because they want to, whereas in the second case

they do so because they need to and in the third because they feel they ought to stay (Allen & Meyer, 1990).

Research has identified some conceptual limitations in this model, such as the low convergent validity of continuance commitment and the low discriminant validity between normative and affective commitment. In reply to these critiques, two interesting alternatives to the three-component approach were advanced. The first was proposed by Cohen (2007) who contends that organizational commitment is two-dimensional, i.e., it can be categorized based on the timing and the nature of commitment. Timing distinguishes between commitment propensity, which develops before entering the organization and organizational commitment, which develops after entry. The nature of commitment distinguishes between commitment based on instrumental motives and commitment based on psychological attachment. By combining these two dimensions a four-component model of commitment emerges, comprising two forms of pre-entry commitment and two forms of post-entry commitment. Before entering the organization individuals can have an instrumental propensity to commit themselves with the organization, based on their expectations about the quality of trade-offs or a normative propensity, based on the values conveyed by their family and culture during their upbringing. After entering the organization individuals can develop an instrumental commitment, based on the perceived quality of trade-offs or an affective one when they identify themselves with the organization, feel emotionally attached to it and experience a sense of belonging. In this context, normative commitment is considered as a commitment propensity that reflects individual differences and that should be examined before entry into the organization rather than after entry. According to Cohen (2007), only affective and instrumental commitment reflect current commitment to the organization, because they are mostly influenced by organizational experiences. Moreover, he states that instrumental commitment is different from continuance commitment, because it focuses on the advantages of staying instead of the disadvantages of leaving the organization, avoiding any potential confusion with outcomes like turnover intention.

More recently, Solinger et al. (2008) proposed a re-conceptualization of the three-component model only in terms of affective commitment based on the idea that continuance and normative commitment represent attitudes toward a specific behaviour (leaving the organization) and not toward the organization as a whole. They argue that affective commitment is broader than the other two forms of commitment representing a general tendency to act in favour of the organization. Therefore, it predisposes individuals to a multiplicity of behaviours and not just to turnover. In their view, the continuance and

normative components should not be considered commitments but instead antecedents of attitudes toward a specific behaviour, i.e., to leave or to stay. In sum, both alternative proposals to the three-component model underline the role of affective commitment, but Solinger et al. (2008) go further and argue that it is the only actual attitude toward the organization, equating affective commitment with organizational commitment.

According to Meyer and Maltin (2010) research has already demonstrated the benefits to organizations of having strongly committed employees, with several meta-analytic reviews showing that organizational commitment is associated with less turnover, more regular attendance, effective performance and organizational citizenship behaviours. These authors' review also points to positive consequences for individuals, especially regarding their well-being. In both cases, the nature of commitment seems to matter, with the best results being attained by affective commitment. Consequently, research has also paid more attention to its antecedents, although more directed to situational factors than to stable individual differences in dispositions (Erdheim, Wang, & Zickar, 2006; Kell & Motowidlo, 2012; Panaccio & Vandenberghe, 2012). Indeed, we were only able to locate three studies investigating the relationship between the Big Five personality factors and organizational commitment, having two of them been published very recently (Erdheim et al., 2006; Kell & Motowidlo, 2012; Panaccio & Vandenberghe, 2012). The first one was conducted by Erdheim et al. (2006) who found that extraversion significantly predicted affective, normative and continuance commitment, whereas neuroticism and openness were only significantly related to continuance commitment and agreeableness was only significantly linked to normative commitment. Finally, conscientiousness predicted affective and continuance commitment. More recently, Kell and Motowidlo (2012) found that both agreeableness and extraversion predicted affective commitment. Panaccio and Vandenberghe (2012) conducted a longitudinal study and found that positive affect and negative affect mediate the link between both agreeableness and extraversion and the different types of commitment.

Therefore, research indicates that the Big Five seem to be relevant dispositional sources of organizational commitment, and also that other intermediate variables can be used to explain this link. Thus, if one takes EI as a trait, it seems reasonable to expect that employees high on EI will also be highly committed to their organizations which is supported by several studies (Carmeli, 2003; Groves & Vance, 2009; Nikolaou & Tsaousis, 2002; Salami, 2008). However, some studies did not corroborate this connection. For example, Rozell et al. (2004) found a significant association between EI and salespersons performance, but not with affective commitment. Also, Moss, Ritossa & Ngu (2006) found no significant associations

between self-reported leaders EI (measured with the SUEIT) and followers commitment (affective and normative). Finally, Aghdasi, Kiamanesh, and Ebrahim (2011) also reported no significant direct or indirect effects of EI on organizational commitment.

Researchers have also looked for moderated relationships in this area. For example, Abraham (2000) found that job control interacted with EI in the prediction of commitment, together explaining 29% of its variance. She found that only when job control was very low (i.e., reduced opportunity to make decisions) EI and commitment were not significantly associated. Similarly, Vigoda-Gadot & Meisler (2010) not only found a significant positive association ($r = .10$, $p < .05$) between EI (assessed with the WLEIS) and affective commitment, but also that EI moderated the relationship between the perceptions of organizational politics and affective commitment, as well as the relationship between political skill and the absenteeism. These findings make an important contribution to understanding conditions affecting this relationship.

Finally, other researchers also explored the cognitive and emotional processes that link EI to commitment. For example, perceived job control (Petrides & Furnham, 2006), job satisfaction (Güleryüz, Güney, Aydin, & Aşan, 2008) situational judgment effectiveness (Choi, Oh, Guay, & Lee, 2011) and emotional exhaustion (Moon & Hur, 2011) were found to be relevant mediator variables in this process.

5.5 Work Engagement and Organizational Commitment

Christian et al. (2011) took organizational commitment as a concurrent variable of engagement in the prediction of job performance, while others have used engagement as an antecedent of commitment. In fact, Bakker, Albrecht, and Leiter (2011) contend that, among others, organizational commitment would be better conceptualized as an outcome of engagement. Moreover, they place engagement as a key mediator variable that links contextual variables to relevant organizational variables. Llorens, Bakker, Schaufeli, and Salanova (2006) found support for this idea based on two different samples with 654 Spanish and 477 Dutch employees. Using structural equations modelling, their results showed that engagement was a partial mediator between job resources and organizational commitment in both samples. On the other hand, a study conducted in the USA with 382 employees and managers, obtained poor model fit for a similar structural model (although antecedents were different and the JD–R model was not explicitly used), both for commitment as a concurrent variable and as an outcome variable of engagement (Wefald, Reichard, & Serrano, 2011).

In an interesting longitudinal study with 2555 dentists, Hakanen, Schaufeli, and Ahola (2008) found that work engagement predicted organizational commitment over a three-year period. However, commitment was measured with only two items from the Healthy Organization Barometer, a questionnaire validated in Finnish organizational studies. Besides being very short and specific of the Finnish context, one of the items sounds largely like engagement ("I'm willing to put serious effort into furthering the basic mission of my organization"), which may have artificially inflated the relationship between both constructs. Therefore, the positioning of organizational commitment as an outcome of engagement would benefit from further examination.

5.6 EI, Work Engagement and Organizational Commitment (Study 5)

We were only able to locate one study that analyses the relationships among EI, work engagement and affective commitment simultaneously (Brunetto, Teo, Shacklock, & Farr-Wharton, 2012). Using Partial Least Squares (PLS) path modelling and a sample of Australian police officers, the authors found that EI leads to job satisfaction and well-being, which in turn lead to employee engagement and affective commitment. Moreover, engagement led to affective commitment, which in turn partially mediated the causal relationship between employee engagement and turnover intentions. However, this study did not include personality in the proposed model, nor did it test for direct relationships between EI and both engagement and commitment. Job satisfaction and well-being were taken as mediators in this process, linking EI to engagement and commitment. Moreover, engagement was measured only in general terms and, therefore, its specific dimensions were not considered in the analysis.

To further explore and expand the previous findings regarding the intervening variables in the process that links personality to organizational commitment, the present study investigates the potential mediating role of engagement in the link between EI and commitment, taking personality into account. In line with the proposals of Cohen (2007) and Solinger et al. (2008), our research model includes affective commitment as the best representing form of organizational commitment. *Figure 31* presents the research model that summarizes the expected relationships among the intended variables in this study.
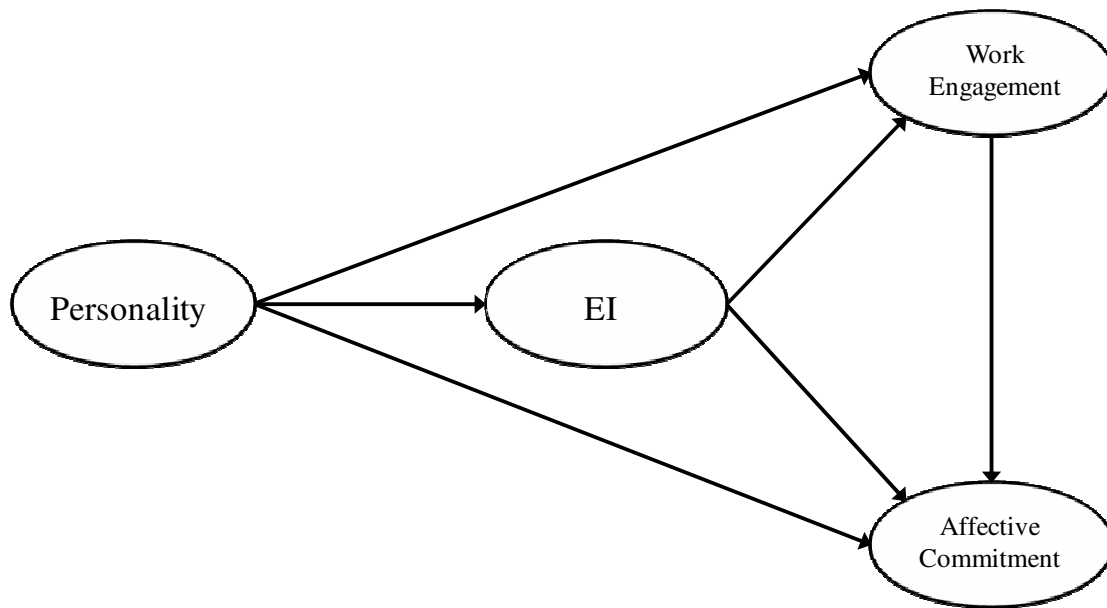
Figure 31 - Research model linking Personality, EI, Engagement and Commitment

5.6.1 Method

Participants and Procedure

The sample for this study consisted of 178 university students from a military academic institution, of which 136 (76.4%) were men. Ages ranged from 18 to 39 years (M_{age} = 23.4 years; SD = 4.3). Respondents were enrolled in different courses (e.g., Engineering, Communications, and Medicine) and in different academic levels (from undergraduate to postgraduate).

Data was collected during November 2010 using the same procedure as in the previous study (see section 4.2.2).

Measures

Personality and EI were measured with the same instruments as in the previous study (see section 4.2.2).

Academic engagement was measured with the Portuguese version of the *Utrecht Work Engagement Scale for Students* - UWES-S (Schaufeli & Bakker, 2004). This 17-item instrument assesses three dimensions of the construct: vigour – 6 items (e.g., When I'm studying, I feel mentally strong), dedication – 5 items (e.g., I find my studies to be full of meaning and purpose), and absorption – 6 items (e.g., Time flies when I'm studying). The complete list of items is shown in Appendices I (English) and J (Portuguese). Respondents

had to judge how frequently they felt in a certain way about their tasks as students, on a 6-point scale (from "never" to "always").

Organizational commitment was measured with the Portuguese version of the 6-item *Affective Organizational Commitment Scale* of Meyer and Allen's (1997) questionnaire. A sample item is: *I would be very happy to spend the rest of my career with this organization.* The complete list of items is shown in Appendices K (English) and L (Portuguese). Respondents were requested to rate the statements about their feelings toward the organization, on a 6-point scale (from "strongly disagree" to "strongly agree").

Statistical Analysis

To analyse the data we used WarpPLS 3.0, as described in the previous study (see section 4.2.2).

5.6.2 Results

Latent Variables Coefficients and Correlations

Table 25 presents the latent variables' coefficients regarding the retained number of items, the scales' reliabilities, AVEs, and full VIFs for this study. We removed items with low loadings on the respective construct or with high cross-loadings. All measures show good internal consistency (CRs > .70) and adequate discriminant validity (mean AVE = 67%, ranging from 49% to 84%), but some full VIFs exceed the 3.3 threshold, indicating potential collinearity problems. This is particularly visible within EI (Inter-EI and ME) and Work Engagement (vigour, dedication and absorption). An inspection of the block VIFs (predictors – criteria) shows three VIFs above 5, but below 10 (Agreeableness – Vigour: 5.256; Openness - Vigour: 5.731 and Absorption - Affective Commitment: 5.936).

Table 25. *Latent Variable's Coefficients for WarpPLS Study 2*

Variable	Items	CR	AVE	Full VIF
Extroversion (E)	2	.817	.691	1.358
Agreeableness (A)	2	.913	.840	3.963
Conscientiousness (C)	2	.902	.822	3.202
Neuroticism (N)	2	.820	.695	1.742
Openness (O)	3	.868	.687	2.512
Intrapersonal EI (Intra-EI)	7	.916	.611	2.706
Interpersonal EI (Inter-EI)	10	.906	.492	3.408
Mobilization of Emotions (ME)	8	.903	.540	3.815
Vigour	6	.923	.536	4.169
Dedication	5	.882	.709	3.388
Absorption	6	.896	.591	4.625
Affective Commitment	3	.925	.805	2.009

Note. CR = composite reliability; AVE = average variances extracted; VIF = Variance Inflation Factor.

Table 26 displays the mean, SD, correlations and square roots of AVEs for each variable. As shown, most of the Big Five scales are significantly related among themselves, except for neuroticism, which is only associated with extroversion ($r = .18$; $p < .05$). Regarding EI scales, while Intra-EI and Inter-EI are not significantly related to each other, Inter-EI and ME are strongly correlated, indicating low discriminant validity (their correlation is higher than the square roots of their AVEs). Similarly, all work engagement components are highly and significantly related among themselves, indicating low discriminant validity (most of their correlations are higher than the square roots of their AVEs). However, we did not consider it problematic as they are measuring the same second order latent variable in both cases (EI in the first case and Work Engagement in the second case). Also, confirmatory factor analyses across the world have shown that the three-factor model of engagement has a better fit than the alternatives (Schaufeli, 2012). Moreover, we kept these variables separated in order to capture the specific relationships with other variables.

Regarding the relationships between personality and EI, agreeableness is significantly associated with all EI components, but extroversion and openness are only significantly associated with Intra-EI. Conscientiousness is significantly associated with Intra-EI and ME, while neuroticism is significantly associated with Inter-EI and ME. Regarding the correlations between personality and work engagement, neuroticism is significantly associated with all its components, whereas agreeableness is only significantly associated with dedication. None of the other Big Five are significantly related to engagement. As for affective commitment, neuroticism is the only Big Five component that does not correlate significantly with this criterion.

Regarding the links between EI and work engagement, Intra-EI is only significantly related with dedication, while Inter-EI and ME are significantly associated with all the components of this criterion. Findings showed that all EI components correlate significantly with affective commitment, while only the work engagement component "dedication" is significantly associated with it.

Table 26. *Latent Variables Correlations for WarpPLS Study 2*

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12
1. Extroversion	3.3	1.2	(.831)											
2. Agreeableness	4.0	1.4	.389***	(.916)										
3. Conscientiousness	3.9	1.4	.351***	.777***	(.907)									
4. Neuroticism	2.8	1.1	.185*	-.043	-.062	(.834)								
5. Openness	3.6	1.3	.437***	.724***	.625***	.098	(.829)							
6. Intra-EI	3.9	1.3	.310***	.717***	.725***	-.094	.590***	(.782)						
7. Inter-EI	4.2	1.0	-.117	.169*	.137	-.529***	.019	.054	(.702)					
8. ME	4.4	1.0	-.030	.278***	.272***	-.572***	.126	.254***	.810***	(.735)				
9. Vigour	3.8	1.1	-.102	-.070	-.131	-.430***	-.113	-.032	.425***	.399***	(.732)			
10. Dedication	4.2	1.2	.050	.199**	.144	-.398***	.094	.177*	.465***	.523***	.739***	(.842)		
11. Absorption	3.8	1.2	-.066	-.021	-.030	-.396***	-.016	.025	.459***	.445***	.840***	.769***	(.769)	
12. Affective Commitment	4.0	1.4	.354***	.609***	.584***	-.130	.543***	.551***	.162*	.277***	-.095	.157*	-.093	(.897)

Note. Square roots of average variances extracted (AVEs) shown on diagonal (within parentheses); All variables had a similar 1-6 range of answers.

* p < .05; ** p < .01; *** p < .001

Structural Model

This section presents the results of a structural model testing the causal relationships among personality, EI, work engagement, and affective commitment. For simplicity reasons, *Figure 32* shows only the significant relationships, together with the beta coefficients (β), effect sizes (f^2) and the R^2 values. For effect sizes, WarpPLS reports Cohen's (1988) f^2 coefficients, representing the absolute values of the individual contributions of the corresponding predictor latent variables to the R^2 coefficients of the criterion latent variable. Values of 0.02 are considered small, 0.15 values are considered medium, and those reaching 0.35 are considered large (Kock, 2012).

The structural model proposed that EI mediates the relationship between personality and work engagement, which in turn is taken as a mediator between EI and affective commitment in order to better capture the process that connects these variables, controlling for different predictors (see *Figure 32*). Findings showed that this model accounts for 52% of the variance of affective commitment and all the fit indicators are in the expected range i.e., APC and ARS are both significant (APC = .140; $p < .001$; ARS = .353; $p < .001$) and AVIF is bellow 5 (2.883).

Regarding the relationship between personality and EI, results indicate that the Big Five explain 60% of the variance of Intra-EI, 31% of Inter-EI and 45% of ME. Intra-EI and Inter-EI are not shown in this model because they were not significantly connected with work engagement and affective commitment. In contrast, ME showed a significant link with dedication (β = .29; $p = .03$), one of the components of work engagement explaining 15% of its variance. In turn, dedication was the only component of work engagement that showed a significant connection with affective commitment (β = .24; $p = .014$) explaining 10% of its variance. Alongside this indirect path, openness had a significant direct impact in affective commitment (β = .20; $p = .02$), explaining 11% of its variance. The other two significant personality predictors (agreeableness and neuroticism) appear to have an indirect effect on dedication and affective commitment, via ME and dedication. However, the only significant isolated indirect effect was from neuroticism to dedication (β = -.14; $p = .04$; $f^2 = .06$). Therefore, ME emerges as a full mediator between neuroticism and dedication, explaining their connection.

Regarding the mediation role of work engagement, dedication emerges as the link that connects ME to affective commitment. However, ME's isolated indirect effect was not statistically significant (β = .07; $p = .09$). Therefore, this model reveals two paths: a direct one

from openness to affective commitment and an indirect one from agreeableness and neuroticism to affective commitment, via EI and work engagement.
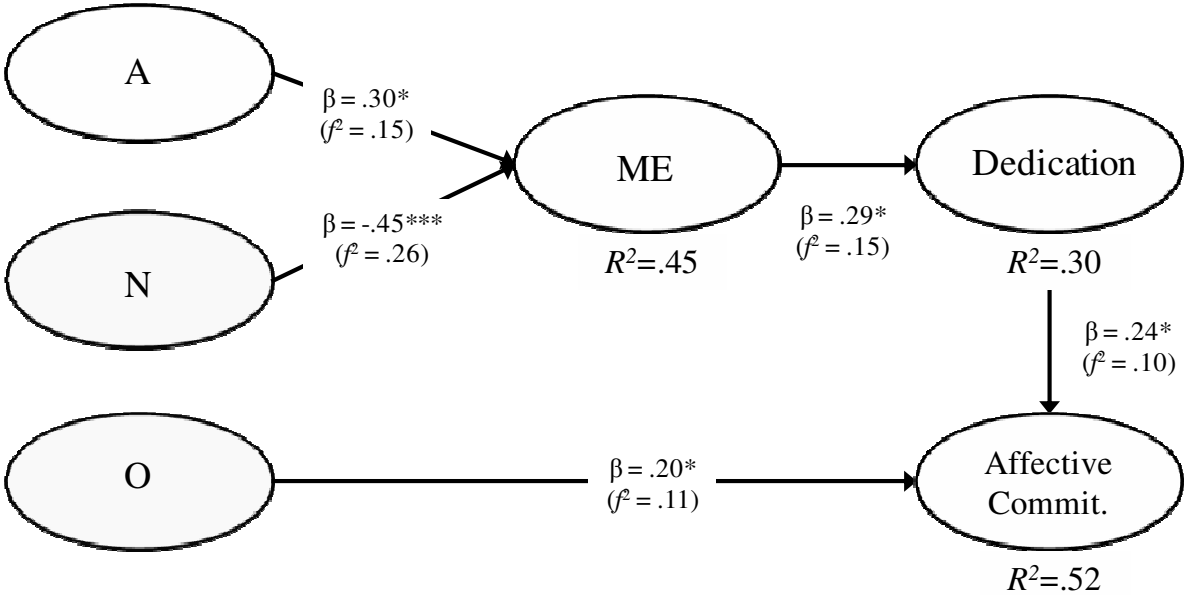
Figure 32. Mediated model with significant paths to Engagement and Commitment.

Note. A = Agreeableness; N = Neuroticism O = Openness; ME = Mobilization of Emotions.

* p < .05; ** p < .01; *** p < .001

Finally, it is notable that all the relationships among the variables in this model are nonlinear, except for the link between ME and dedication (*Figure 33*). For example, the link between openness and affective commitment shows a logarithmic relationship (Meyer, 2009) with a positive effect up to around 2SDs above the mean and declining afterwards (Figure 34). In this case, the optimal point seems to be situated between 1 and 2 SDs above the mean. In contrast, the link between dedication and affective commitment takes the form of a *U-*curve, with a negative slope, up to 1 SD below the mean, which turns into a positive slope after that point (Figure 35).

Figure 33. Linear relationship between ME and dedication.

Figure 34. Logarithmic relationship between openness and affective commitent.

Figure 35. *U*-shaped relationship between dedication and affective commitent.
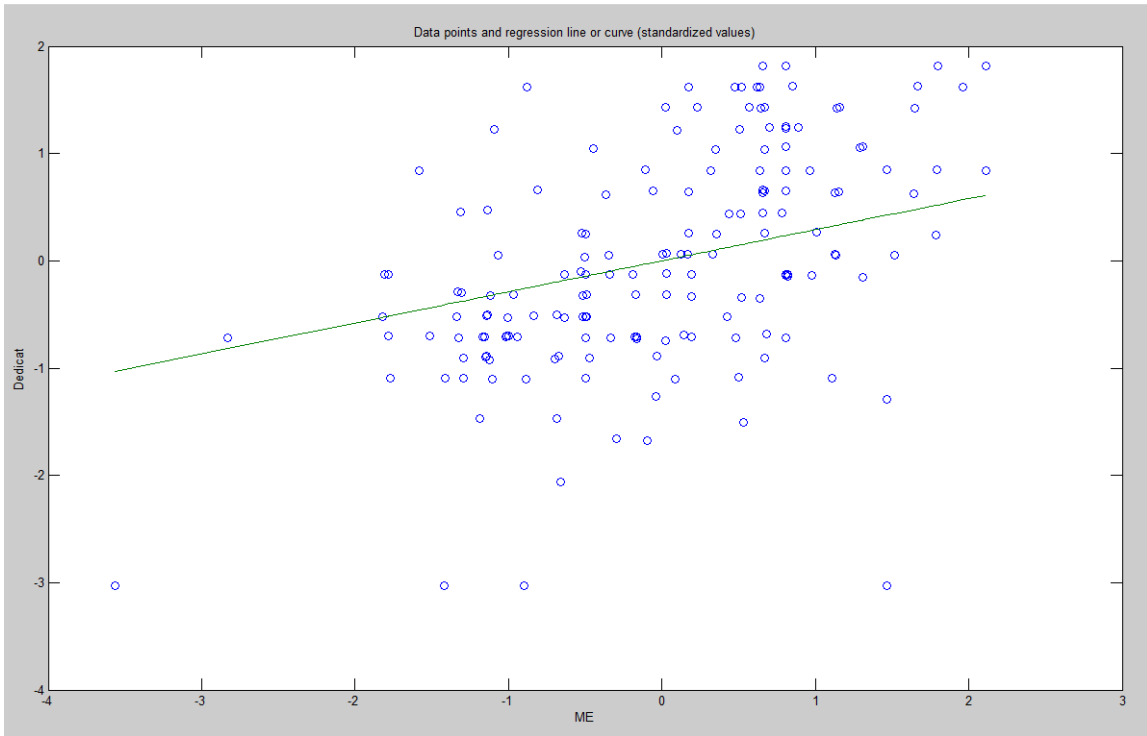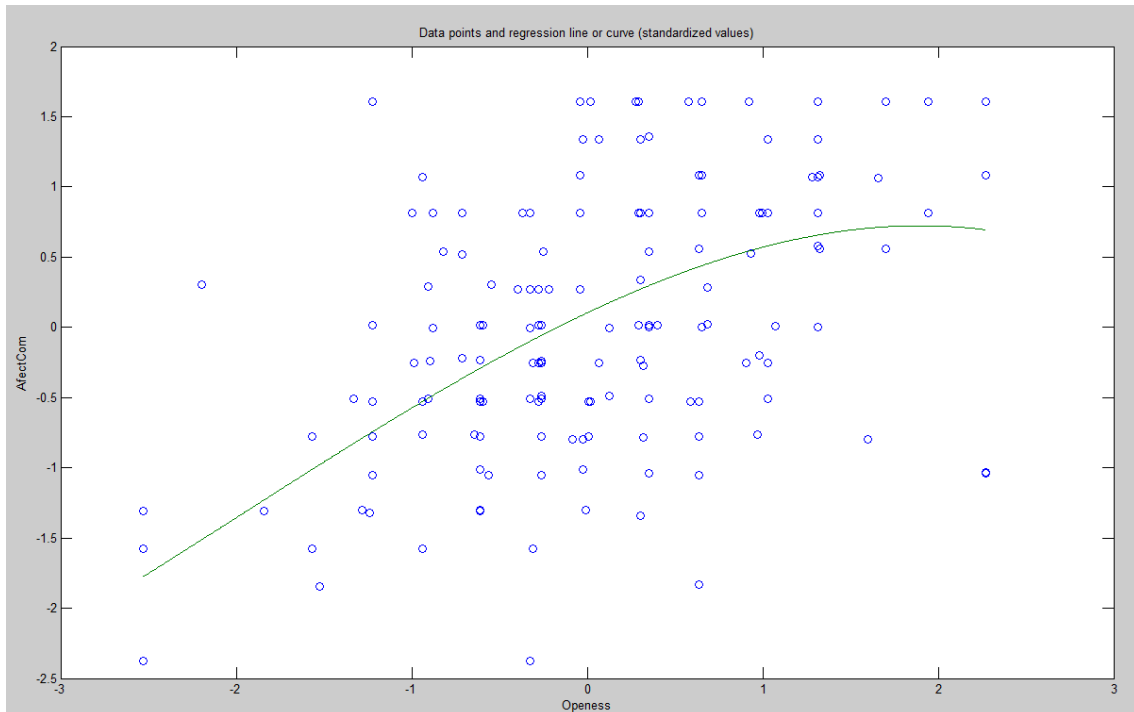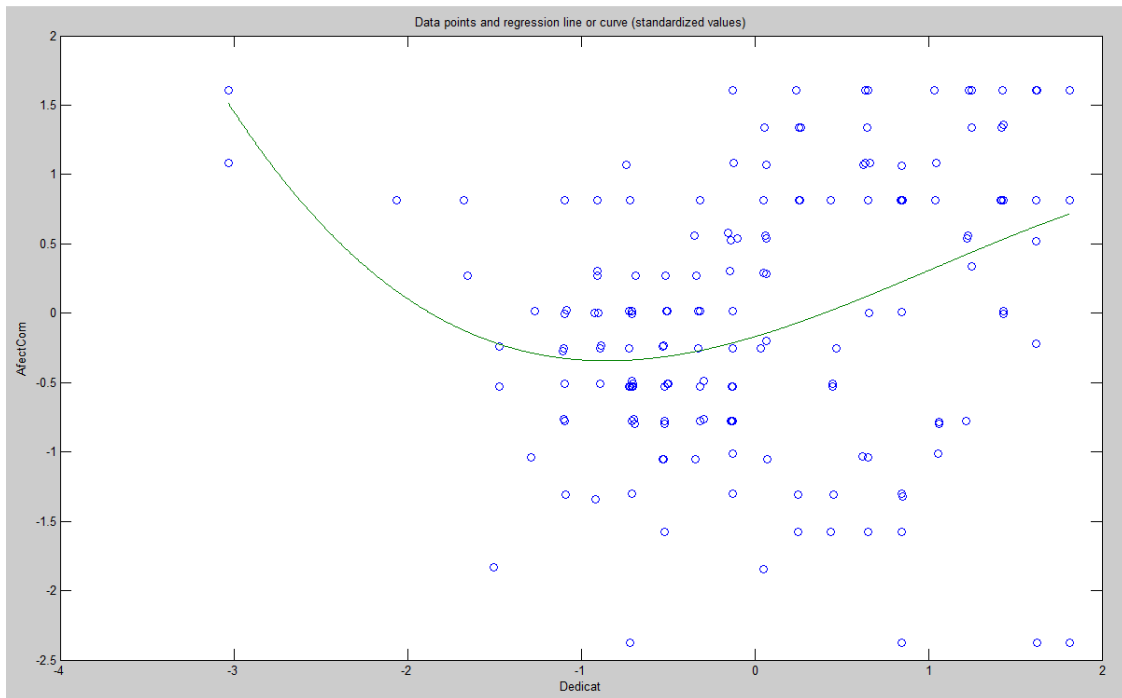
In contrast with the results obtained with WarpPLS, a supplementary PLS linear regression analysis performed with this model showed more significant paths among the variables. For example, significant links emerged between neuroticism and both vigour and absorption ($\beta = -.25$; $p = .001$ and $\beta = -.18$; $p = .023$, respectively). Similarly, a significant link emerged between conscientiousness and vigour ($\beta = -.29$; $p = .01$), as well as between extroversion and affective commitment ($\beta = .22$; $p = .01$). Inter-EI also showed a significant connection with vigour ($\beta = .24$; $p = .04$) and absoption with affective commitment ($\beta = -.37$; $p = .003$). However, the explained variance was slightly lower for ME ($R^2 = .40$) and affective commitment ($R^2 = .50$). Therefore, the linear approach captured a different pattern of relationships among the variables, accounting for a little less variance in the final outcome.

5.6.3 Discussion

The purpose of this study was to contribute to the development of trait EI research in three main ways: (1) by moving beyond isolated direct effects and examining not only EI's role as a mediator in the processes that link personality to both work engagement and affective commitment, but also by testing engagement as a mediator in the link between EI and commitment; (2) by analysing EI's and work engagement's specific facets effects, instead of simply looking at their global effect, and (3) by exploring nonlinear relationships among these variables.

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Results indicated that personality explained considerable variance in trait EI, especially in the intrapersonal dimension. However, EI still accounted for additional variance in the criteria variables, similarly to our previous study. Moreover, including EI as a mediator uncovered important indirect paths linking personality to both outcomes. Finally, results revealed curvilinear relationships between most of the variables, expanding previous research from linear based techniques and reinforcing the importance of studying likely moderators and mediators.

Although previous attempts were made to test the role of work engagement as a mediator between personality and affective commitment, results indicated problems in model fit using linear techniques (e.g., Wefald et al., 2011). In contrast, our study not only found good fit for the mediated model, but also obtained three interesting results: (1) that dedication was the key work engagement's component in this process; (2) that EI (more specifically ME) also mediates the relationship between personality and work engagement; and (3) that relationships among these variables are mainly nonlinear (the only exception was the connection between ME and dedication). These findings add new information to the extant literature regarding the mechanisms that explain these relationships. It seems that personality's effect on work engagement is mediated by EI and that, in turn, EI's effect on affective commitment is mediated by work engagement. This means, that practitioners should pay attention to these variables in order to increase emotional attachment to the organization.

Summary and conclusions

This chapter aimed to give an outline of the main implications of EI to the organization and to make a contribution to the current state of the art in this domain with an empirical study. We started by giving an overview of the mainstream research in this area and then we presented the findings of our study relating EI to engagement and organizational commitment. As in the previous study we used a mediated model which included personality as an antecedent of EI, in an effort to better represent a more complete picture of the dynamics involved in the processes that link these variables. This allowed us to see that although EI is significantly explained by personality, especially in the intrapersonal domain, it still explains additional variance in the intended outcomes. Indeed, it seems to play an important mediating role is the process that links personality to engagement and commitment. Moreover, we tested the structural model with a nonlinear approach that enabled us to capture a different, hopefully more realistic, pattern of relationships as compared with the more traditional linear one. Therefore, we believe this makes a relevant contribution to the extant literature in this area, opening a new window of research for EI.

Final Conclusion

As in all theory building within the Social Sciences, EI research has been a field where definitions proliferate, models and measures flourish with the ambivalent outcome of having a rich collection of contributions but with a doubtful ability to build cumulative knowledge. The case of EI is paradigmatic of all constructs that have attracted the attention of scholars and practitioners having captivated the common sense, resulting in divergent and often confusing ideas about its nature, dynamics and added value for Science and Society. This situation cannot continue without creating vulnerabilities in extant research. The EI case is no exception and we believe research has been growing on three implicit assumptions that can be seen as three vulnerabilities. The first is that one has to choose amongst the several schools of thought in studying EI (because they are mutually exclusive). The second is that EI is an umbrella construct encompassing an undetermined number of emotional-related construct, and the last is that EI relates to other constructs in a linear manner.

Overall this work aimed to challenge these assumptions and hopefully extend the literature on EI, in an effort to contribute to its scientific validation as a relevant psychological construct both to individuals and organizations. The first contribution concerns our proposal to combine EI's different conceptualizations in a multi-layered integrative model representative of existing approaches (e.g., ability, trait). This model aims to apprehend the whole picture instead of the small pieces, rescuing EI from the "curse of fragmentation". The second challenge was to find a valid Core Components model that best represents the main EI dimensions in an effort to clarify its breadth and avoid the risk of using EI as an over inclusive construct. Finally, we wanted to broaden previous empirical findings by using nonlinear techniques to test the added value of EI as a mediator in the processes that link antecedents like personality to relevant outcomes (e.g. academic achievement, well-being, work engagement, and organizational commitment). This allowed us to challenge the often assumed linearity of these relationships, which seem less realistic given the nature of the variables.

In order to tackle the mentioned challenges we have structured a set of studies that started with a review of the extant literature with a focus on both conceptual and theoretic levels. The first two chapters comprehend this review setting the stage for the analysis of the conceptual nature of EI and the existing approaches in its study. An intended outcome of these initial chapters was accepting that EI has been approached in differing ways that tend not to converge, and thus suffer from the "curse of fragmentation".

The third chapter explored the above mentioned challenges. It started by developing a theoretically-build integrative model of EI which we believe to have shown that diverging approaches are not mutually exclusive. Following it, we proposed and tested the core components of EI which we empirically sustained with a new measure. Therefore it is possible to operate with a parsimonious model of EI that captures the central components of EI and avoids the trap of over inclusiveness. At this stage one can accept that the proposed model and measure has both content and construct validity. However, the survival of any construct also depends on its predictive and incremental validity, especially when it has a controversial background. Chapters four and five test the added value of the construct by conducting a meta-analysis on the association of EI and health, as well as two empirical studies on the incremental validity of EI over personality traits in predicting academic performance, work engagement, and organizational commitment. At this stage we believe to have shown that EI is a valid construct that brings added value operating as a mediator between personality traits and important outcomes for individuals and organizations. These empirical studies were also designed in order to address the third assumption (linearity) and thus challenge the linear perspective. We believe findings to have sufficiently indicated that the linear assumption fails to capture important relations thus increasing type II error which translates into a loss of explained variance and thus, the centrality of the construct is not entirely understood.

All in all, we firmly believe the present work to have built the case to sustain a plausible fundamental change in research EI. Is EI necessarily a fragmented field of research where "intelligence partisans" and "personality trait partisan" cannot find a common ground? We sustain it is not necessarily so. Is a comprehensive model of EI necessarily over inclusive? We sustain that a focus on its core components suffices, and therefore it is not necessarily an umbrella construct, and the level of dispersion is actually optional. By assuming that EI is a lower-level personality construct, should it be discarded as old wine in new bottles? The findings concerning its mediator role and incremental validity sustain it should not be discarded. Finally, should we continue studying its relationships in a linear manner? Findings indicate this option offers less insight and predictive power to models that they actually have.

Lastly, one cannot ignore the discussion that is going on in the Academia whether we should keep the label "Emotional Intelligence" for this construct or if we should migrate to a new label avoids the immediate connotation with intelligence as well as the paradox of naming it as "trait EI". Accepting alternative labels to "Emotional Intelligence" can offer the promise of a renewed, more integrative approach but one should consider that EI is already

well-known in both the academia and organizations and renaming the construct now could risk leaving more than 20 years of research behind. Alternatively more complex models that reflect a multi-layer structure both with consequences at the conceptual, nomological and theoretical level may open new ways of integrating streams of research that jointly reinforce knowledge. The question is that one can neither conceive the wine without the bottle nor the bottle without the wine.

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Appendix A – SEIS (English)

Schutte Emotional Intelligence Scale (Schutte et al., 1998)

1. I know when to speak about my personal problems to others

2. When I am faced with obstacles, I remember times I faced similar obstacles and overcame them

3. I expect that I will do well on most things I try

4. Other people find it easy to confide in me

5. I find it hard to understand the non-verbal messages of other people

6. Some of the major events of my life have led me to re-evaluate what is important and not important

7. When my mood changes, I see new possibilities

8. Emotions are one of the things that make my life worth living

9. I am aware of my emotions as I experience them

10. I expect good things to happen

11. I like to share my emotions with others

12. When I experience a positive emotion, I know how to make it last

13. I arrange events others enjoy

14. I seek out activities that make me happy

15. I am aware of the non-verbal messages I send to others

16. I present myself in a way that makes a good impression on others

17. When I am in a positive mood, solving problems is easy for me

18. By looking at their facial expressions, I recognize the emotions people are experiencing

19. I know why my emotions change

20. When I am in a positive mood, I am able to come up with new ideas

21. I have control over my emotions

22. I easily recognize my emotions as I experience them

23. I motivate myself by imagining a good outcome to tasks I take on

24. I compliment others when they have done something well

25. I am aware of the non-verbal messages other people send

26. When another person tells me about an important event in his or her life, I almost feel as though I have experienced this event myself

27. When I feel a change in emotions, I tend to come up with new ideas

28. When I am faced with a challenge, I give up because I believe I will fail

29. I know what other people are feeling just by looking at them

30. I help other people feel better when they are down

31. I use good moods to help myself keep trying in the face of obstacles

32. I can tell how people are feeling by listening to the tone of their voice

33. It is difficult for me to understand why people feel the way they do

SEIS - Schutte Emotional Intelligence Scale (Schutte et al., 1998)

1. Sei quando devo falar dos meus problemas pessoais aos outros

2. Quando me deparo com obstáculos, procuro lembrar-me de outros momentos em que tive de enfrentar e consegui ultrapassar obstáculos semelhantes

3. Espero sair-me bem na maior parte das coisas que experimento

4. Os outros acham fácil fazer-me confidências

5. Tenho dificuldade em compreender as mensagens não verbais das outras pessoas

6. Alguns dos principais acontecimentos da minha vida levaram-me a reavaliar aquilo que é ou não importante

7. Quando o meu humor muda vejo novas possibilidades

8. As emoções são uma das coisas que fazem com que a minha vida valha a pena

9. Tomo consciência das minhas emoções à medida que as vou sentindo

10. Espero que aconteçam coisas boas

11. Gosto de partilhar as minhas emoções com os outros

12. Quando sinto uma emoção positiva sei como fazê-la perdurar

13. Proporciono ocasiões que os outros apreciam

14. Procuro actividades que me fazem sentir feliz

15. Tenho consciência das mensagens não-verbais que envio aos outros

16. Consigo mostrar-me de modo a causar uma boa impressão nos outros

17. Quando estou bem disposto(a) consigo resolver os problemas facilmente

18. Ao olhar para a sua expressão facial consigo reconhecer aquilo que as pessoas estão a sentir

19. Sei porque as minhas emoções mudam

20. Quando estou bem disposto(a) consigo ter novas ideias

21. Tenho controlo sobre as minhas emoções

22. Consigo facilmente reconhecer as minhas emoções quando as estou a sentir

23. Motivo-me a mim próprio(a) imaginando que obtenho bons resultados nas tarefas que realizo

24. Elogio os outros quando fazem alguma coisa bem feita

25. Tenho consciência das mensagens não-verbais que as outras pessoas enviam

26. Quando uma pessoa me relata um acontecimento importante da sua vida quase que o sinto como se tivesse sido eu a vivê-lo
27. Quando sinto uma mudança nas minhas emoções, tendo a ter novas ideias
28. Quando me deparo com um desafio desisto, porque acho que vou falhar
29. Consigo saber o que as outras pessoas estão a sentir só de olhar para elas
30. Ajudo as outras pessoas a sentirem-se melhor quando estão em baixo
31. Utilizo a boa disposição para me ajudar a continuar a tentar perante os obstáculos
32. Consigo perceber o que as pessoas estão a sentir pelo tom da sua voz
33. É difícil para mim compreender porque as pessoas se sentem de uma determinada maneira

Appendix C – CCEIQ (English)

Core Components Emotional Intelligence Questionnaire

1. Generally I know what to do and say to calm down someone who is angry
2. When I am faced with obstacles, I remember times I faced similar obstacles and overcame them
3. I am often sad, happy or angry without understanding why
4. I use my good mood to help me persist in face of obstacles
5. I can easily recognize whether a person is sad by looking at his/her facial expression
6. Generally, I can find ways to control my emotions when I want
7. When I have something difficult to do, I often imagine that all will go well in order to feel confident
8. When someone I know is in a bad mood, I can help him/her calm down and feel better soon
9. I motivate myself by imagining that I'll get good results in the tasks I perform
10. I can read very well the non-verbal messages other people send
11. I find it easy to express my emotions through words
12. When I feel sad I tend to see the negative side of things
13. I have trouble keeping calm in difficult or stressful situations
14. Generally know what to do and say to cheer a person who is sad
15. When I get angry, I have difficulty dealing with my feelings of rage
16. I can quickly see what a person is feeling just by looking at her/him
17. When I make decisions, I listen to my feelings to see if the decision seems correct
18. When I am in a good mood I take this opportunity to do things that allow me to extend this state of mind
19. Normally, I can put myself in others' shoes and feel their emotions
20. When I get an unfair criticism I feel a mixture of emotions that I cannot distinguish
21. Just from watching how someone else behaves I can tell how he/she feels
22. I tend to let myself down with criticisms that I receive
23. I use my sense of humour to reduce the tension and put people at ease
24. I always tell myself I am a competent person
25. I feel that most people that open up with me, turn out feeling better
26. It is not me who controls my emotions but my emotions that control me

27. I can tell if someone is lying to me, just by looking at his/her facial expression
28. When I need to make an important decision, I usually take in to account what I feel
29. I usually motivate myself to do my best

Appendix D – CCEIQ (Portuguese)

Core Components Emotional Intelligence Questionnaire

1. Geralmente, sei o que fazer e dizer para acalmar uma pessoa que está irritada.
2. Quando me deparo com obstáculos, procuro lembrar-me de outros momentos em que tive de enfrentar e consegui ultrapassar obstáculos semelhantes.
3. É frequente sentir-me triste, alegre ou zangado sem perceber porquê.
4. Utilizo a boa disposição para me ajudar a persistir perante os obstáculos.
5. Consigo, facilmente, reconhecer se uma pessoa está triste, olhando para a sua expressão facial.
6. Geralmente, consigo encontrar formas de controlar as minhas emoções, quando quero.
7. Quando tenho de fazer alguma coisa difícil, geralmente, imagino que tudo vai correr bem, de modo a sentir-me confiante.
8. Quando alguém que conheço está de mau humor, consigo ajudar a acalmar-se e a sentir-se melhor, rapidamente.
9. Motivo-me a mim próprio(a) imaginando que vou ter bons resultados nas tarefas que realizo.
10. Consigo ler muito bem as mensagens não-verbais que as outras pessoas enviam.
11. Tenho facilidade em expressar as minhas emoções através das palavras.
12. Quando me sinto triste tenho tendência para ver o lado negativo das coisas.
13. Tenho dificuldade em manter a calma em situações difíceis ou stressantes.
14. Geralmente, sei o que fazer e dizer para animar uma pessoa que está triste.
15. Quando me aborrecem, tenho dificuldade em lidar com os meus sentimentos de raiva.
16. Consigo, rapidamente, perceber aquilo que uma pessoa está a sentir, só de olhar para ela.
17. Quando tomo decisões, ouço os meus sentimentos para ver se a decisão parece correcta.
18. Quando me sinto bem-disposto(a), aproveito para fazer coisas que me permitam prolongar esse estado de espírito.
19. Normalmente, sou capaz de me colocar no lugar dos outros e sentir as suas emoções.
20. Quando recebo uma crítica injusta sinto uma mistura de emoções, que não consigo distinguir.
21. Basta-me ver como outra pessoa se comporta para perceber como se sente.
22. Tenho tendência a deixar-me abater pelas críticas que me fazem

23. Costumo usar o meu sentido de humor para descontrair o ambiente e pôr as pessoas à vontade.

24. Digo sempre a mim mesmo que sou uma pessoa competente.

25. Sinto que a maioria das pessoas que desabafa comigo acaba por sentir-se melhor.

26. Não sou eu quem controla as minhas emoções, são as emoções que me controlam a mim.

27. Consigo perceber se uma pessoa me está a mentir, olhando para a sua expressão facial.

28. Quando é necessário tomar uma decisão importante, geralmente tenho em conta aquilo que sinto.

29. Costumo motivar-me para conseguir dar o máximo.

Appendix E - Mini-IPIP (English)

Short inventory from the International Personality Item Pool (Donnellan et al., 2006)

1. Am the life of the party.

2. Sympathize with others' feelings

3. Get chores done right away.

4. Have frequent mood swings.

5. Have a vivid imagination.

6. Don't talk a lot. (R).

7. Am not interested in other people's problems. (R)

8. Often forget to put things back in their proper place. (R)

9. Am relaxed most of the time. (R)

10. Am not interested in abstract ideas. (R)

11. Talk to a lot of different people at parties.

12. Feel others' emotions.

13. Like order.

14. Get upset easily.

15. Have difficulty understanding abstract ideas. (R)

16. Keep in the background. (R)

17. Am not really interested in others. (R)

18. Make a mess of things. (R)

19. Seldom feel blue. (R)

20. Do not have a good imagination. (R)

Appendix F - Mini-IPIP (Portuguese)

Short inventory from the International Personality Item Pool (Donnellan et al., 2006)

1. Sou a alma de uma festa.
2. Empatizo com os sentimentos dos outros.
3. Faço logo aquilo que tenho a fazer.
4. Tenho mudanças de humor frequentes.
5. Tenho uma imaginação fértil.
6. Não falo muito.
7. Não me interesso pelos problemas dos outros.
8. Esqueço-me, frequentemente, de arrumar as coisas no seu lugar.
9. Sou, geralmente, uma pessoa tranquila.
10. Não me interesso por ideias abstractas.
11. Falo com muitas pessoas diferentes nas festas.
12. Sinto as emoções dos outros.
13. Gosto de ordem.
14. Irrito-me facilmente.
15. Tenho dificuldade em compreender ideias abstractas.
16. Não dou nas vistas.
17. Não me interesso muito pelos outros.
18. Sou uma pessoa trapalhona.
19. Raramente me sinto triste.
20. Não tenho uma boa imaginação.

Appendix G - Affective Well-being Questionnaire (English)

Job-related Affective Well-being Questionnaire (Warr, 1990)

1. Tense
2. Uneasy
3. Worried
4. Calm
5. Contented
6. Relaxed
7. Depressed
8. Gloomy
9. Miserable
10. Cheerful
11. Enthusiastic
12. Optimistic

Appendix H - Affective Well-being Questionnaire (Portuguese)

Job-related Affective Well-being Questionnaire (Warr, 1990)

1. Tenso
2. Ansioso
3. Preocupado
4. Calmo
5. Satisfeito
6. Tranquilo
7. Deprimido
8. Triste
9. Muito infeliz
10. Animado
11. Entusiasmado
12. Optimista

Appendix I - UWES-S (English)

Utrecht Work Engagement Scale - Student Version (Schaufeli & Bakker, 2004)

1. When I'm doing my work as a student, I feel bursting with energy
2. I find my studies full of meaning and purpose
3. Time flies when I am studying
4. I feel energetic and capable when I'm studying or going to class
5. I am enthusiastic about my studies
6. When I am studying, I forget everything else around me
7. My studies inspires me
8. When I get up in the morning, I feel like going to class
9. I feel happy when I am studying intensely
10. I am proud of my studies
11. I am immersed in my studies.
12. I can continue studying for very long periods at a time
13. To me, my studies are challenging
14. I get carried away when I am studying
15. I am very resilient, mentally, as far as my studies are concerned
16. It is difficult to detach myself from my studies
17. As far as my studies are concerned I always persevere, even when things do not go well

Appendix J - UWES-S (Portuguese)

Utrecht Work Engagement Scale - Student Version (Schaufeli & Bakker, 2004)

1. As minhas tarefas como aluno fazem-me sentir cheio(a) de energia.
2. Creio que o meu curso tem significado.
3. O tempo passa a voar quando estou a realizar as minhas tarefas como aluno.
4. Sinto-me com força e energia quando estou a estudar ou vou às aulas.
5. Estou entusiasmado(a) com o meu curso.
6. Esqueço tudo o que se passa à minha roda quando estou concentrado(a) nos meus estudos.
7. Os meus estudos inspiram-me coisas novas.
8. Quando me levanto de manhã apetece-me ir para as aulas ou estudar.
9. Sinto-me feliz quando estou a fazer tarefas relacionadas com os meus estudos.
10. Estou orgulhoso(a) de fazer este curso.
11. Estou imerso nos meus estudos.
12. As minhas tarefas como aluno não me cansam.
13. O meu curso é desafiante para mim.
14. "Deixo-me ir" quando realizo as minhas tarefas como aluno.
15. Sou uma pessoa com força para enfrentar as minhas tarefas como aluno.
16. Sinto-me envolvido(a) no meu curso.
17. Em relação aos meus estudos, persevero sempre (persisto) mesmo quando as coisas não correm bem.

Appendix K - Affective Organizational Commitment Scale (English)

(Meyer & Allen, 1997)

1. I would be very happy to spend the rest of my career in this organization.
2. I really feel as if this organization's problems are my own.
3. I do not feel like "part of the family" at my organization. (R)
4. I do not feel "emotionally" attached to this organization. (R)
5. This organization has a great deal of personal meaning for me.
6. I do not feel a strong sense of belonging to my organization. (R)

Appendix L - Affective Organizational Commitment Scale (Portuguese)

(Meyer & Allen, 1997)

1. Eu ficaria muito contente se passasse o resto da minha carreira profissional nesta Instituição
2. Eu sinto mesmo os problemas desta Instituição como se fossem meus
3. Nesta Instituição eu não me sinto como "fazendo parte da família (R)
4. Eu não me sinto "afectivamente vinculado" a esta Instituição (R)
5. Esta Instituição tem um grande significado pessoal para mim
6. Eu não sinto um grande sentimento de pertença a esta Instituição (R)

Appendix M – Curriculum Vitae (English)

Alexandra Maria Miranda Pinheiro Martins

45 years old	E-mail: alexmmartins@sapo.pt
Married (1 child)	alexandra_martins@iscte.pt
Portuguese	

Education and Training

2007/2013 (expected)	PhD in Psychology
	ISCTE- IUL – University Institute of Lisbon
	Topic: Emotional Intelligence
	Supervisor: Prof. Nelson Campos Ramalho (PhD) – ISCTE-IUL
	Co-supervisor: Prof. Estelle M. Morin (PhD) – HEC Montreal (Canada)
2002/2005	Masters in Social and Organizational Psychology
	ISCTE- IUL – University Institute of Lisbon
	Title: "Organizational culture and conflict management: The influence of organizational culture on interpersonal conflict resolution approach".
	Supervisor: Prof. José Gonçalves das Neves (PhD)
	Final classification: Very Good
1986/1991	Psychology degree - Social and Organizational Psychology
	Faculty of Psychology and Education Sciences - Lisbon University
	Grade Point Average: 15

Work Experience

	In the Academia
2011/2012 2009/2010 (2 semesters)	ISCTE- IUL – University Institute of Lisbon School of Social Sciences Preparing and lecturing an optional discipline of Emotional Intelligence in collaboration with Prof. Nelson Ramalho (PhD), for the Masters in Psychology of Emotions.
April/2002 to February/2008 (6 years)	Business School Polytechnic Institute of Setúbal Human Resources and Organizational Behaviour Department Invited Assistant Professor in Interpersonal Relations, Recruitment & Selection and Human Resources Management.

	In Organizations
Mai/1997 to April/2002 (5 years)	Modelo Continente Hipermercados, SA (Sonae Retail Group) Recruitment & Selection Department Attracting and selecting retail personnel, supervisors and technicians (e.g. Product Managers, Auditors, Bank Clerks, IT Technicians) for supermarkets, sports and IT stores and central departments (e.g. Marketing, Sales, Finance). Creating and publishing job advertisements, CV screening, job interviews, psychological tests, writing psychological reports and hiring new employees.
June/1995 to December/1996 (18 months)	Registrade - Information, Communication & Services (Portugal Telecom Group) Training Department Identifying training needs, planning, implementing and assessing training programs. Creating the New Employees Welcome Guide (Portuguese and English)
December /1992 to March/1995 (27 months)	Homens & Sistemas, Lda. (Consultancy Company) Human Resources Consultant Marketing Department (17 months) Organizing the company's customer's data base, contacting customers and prospects, organizing mailings and press releases, negotiating and selecting company's stationary materials with suppliers. Recruitment & Selection Department (4 months) CV screening, interviews, group tests, psychological testing and writing evaluation reports. Training Department (6 months) Organizing conferences and creating scripts for training videos.
March/1992 to November/1992 (8 months)	Vocational Training Centre for the Food Sector (Public Institute) Recruitment & Selection Department Recruiting and selecting trainees for Backing & Pastry, Cooking, Barman, Waiter, Restaurant Manager and Technical Quality Control courses. Creating and publishing advertisements for the available training programs, screening applicants, conducting interviews and selecting candidates.

Lectured Training Seminars and Workshops

October/2010	"Introducing Emotional Intelligence to Project Managers" (3h Workshop) - IBS-ISCTE Business School
	Conferences and Workshops Series for Project Management
	APOGEP (Portuguese Association for Project Management)
September/2010	"Negotiation and Conflict Management" (30h Training Seminar)
September/2009	AFA – Portuguese Air Force Academy – Air Base Nr.1 (Pêro Pinheiro)
October/2007	Military-technical trainees
October/2006	

Presented Communications

	During the doctoral program
September/2011	"The warped relationships between personality, emotional intelligence, academic success and well-being" - 3rd International Congress on Emotional Intelligence - Opatija (Croatia)
July/2011	"A new look at Schutte's et al. (1998) Emotional Intelligence Scale" - ISSID 2011 - International Society for the Study of Individual Differences - University of London (UK)
September/2009	"Does being emotionally intelligent mean being healthy? Extending previous meta-analytic findings"- II Congreso Internacional de Inteligencia Emocional – Santander (Spain)
Mai/2009	"Emotional intelligence: Testing a new model and measure"- 14th European Congress of Work and Organizational Psychology - Santiago de Compostela (Spain)
August/2008	"L'intelligence émotionnelle ou comment perdre son latin" - 15ème congrès de Psychologie du Travail et des Organisations - AIPTLF - Association Internationale de Psychologie du Travail de Langue Française - Université de Laval – Québec (Canada)

	Others
September/2010	"Emotional Intelligence in the context of Project Management" Project Managers' Week - APOGEP (Portuguese Association for Project Management) – CCB- Cultural Centre of Belém (Lisbon)
Mai/2007	"Preparing for Job Interviews"
Mai/2006	Workshop series on "Preparing for the working life"

	Business School - Polytechnic Institute of Setúbal
Janeiro/2006	"Organizational Culture and Interpersonal Conflict in the Portuguese Navy" - Portuguese Navy's School Seminars Series (Alfeite)
Mai/2005	"How to apply for a job"
	Seminar on "The Future of the Electro Mechanic Engineer"
	Technology School - Polytechnic Institute of Setúbal
October/2004	"Organizational culture and conflict management: The influence of organizational culture on interpersonal conflict resolution approach" (Research conducted during the VI Masters in Social and Organizational Psychology)
	Social and Organizational Psychology National Research Meeting
	ISCTE- IUL – University Institute of Lisbon
July/2003	"Interpersonal relationship needs, locus of control and stress: presentation of an interpretation model"
	Stress Star: 24th International Conference on Stress and Anxiety – Stress and Anxiety Research Society
	FIL - International Fair of Lisbon (Parque das Nações)

Scientific Publications

2010	Martins, A., Ramalho, N. & Morin, E. (2010). A comprehensive meta-analysis of the relationship between Emotional Intelligence and health. *Personality and Individual Differences*, *49*(6), 554-564.

Methodological Training

Received during the doctoral program

2011	Multi-level analysis in Psychological research using SPSS - Leoniek Wijngaards-de Meij (12h)
	Content analysis: The statistical analysis of text and open-ended responses - Nicole Kronberger (6h)
2010	Writing and publishing in scientific journals – Lynn Shore (3h)
2009	Moderation and Mediation with SEM – Cícero Pereira (15h)
	Linear Models II: Multiple Linear Regression - Helena Carvalho (18h)
	Writing & Reviewing Scientific Papers - Thomas Schubert (8h)
	Linear Models I: n-way ANOVA e n-way MANOVA - Helena Carvalho (18h)

2008	Confirmatory Factor Analysis - Cícero Pereira (18h)
	Publishing in International Scientific Journals - Miriam Erez (6h)
	Meta-Analysis - Tirza Leader (18h)
	Multi-Level Analysis - Vicente González Romá (18h)

Additional Online Courses

March/2010	Structural Equation Modelling (SEM) with WarpPLS - Geoffrey S. Hubona (4h)
December/2009	Structural Equation Modelling (SEM) with Partial Least Squares (PLS) path modelling using SmartPLS - Geoffrey S. Hubona (7h)

Professional Training in Organizations

Janeiro/2000	Intensive Training in "Men Animation" (2 days) - Dynargie - Luso
September/1999	Certified user of SHL's Aptitudes and Personality Tests - Lisbon
1999	Certified user of APP's Personality Test - SGRH Thomas International - Lisbon
October/1998	"Dynergic Managers" (4 days) - Dynargie – Lisbon
Janeiro a March/1997	Certified Trainer - Level 1 (72 h) - CECOA – Lisbon
September a November/1996	Developing Managers: Leadership, Time Management and Public Presentations - EXODUS-TMI – Estoril
June/1995	Microsoft Office - Sight - Lisbon
November/1994	Telemarketing - Homens & Sistemas – Lisbon
Janeiro a February/1993	New Technologies, Management and Organizational Behaviour – Young Technicians for Industry Program - INETI – Lisbon
November/1992	Neurolinguistic Programming Workshop - Prof. Dr. Lair Ribeiro - SINASE – Lisbon
March/1991	Assessment Centres Workshop - Dr. Hélio Moreira - EGOR Gestão e Finanças, Lda. - Lisbon

Additional skills

English	Proficient user: listening and reading comprehension, speaking and writing. Practice in presenting communications in international congresses, reading and writing scientific papers in English.
1986	Frequency of PA1 and PA2 "Proficiency" levels British Council - Lisbon

	1985	"First Certificate in English" from Cambridge University
		British Council - Lisbon
French		Independent user: listening and reading comprehension, speaking and writing. Presented an oral communication in French in an international congress and prepared the respective scientific paper.
	2008	French private lessons to prepare for the communication presented in Québec (Canada)
		ILA – Language Institute of Algés (Lisbon)
Spanish		Independent user: listening and reading comprehension
		Regular user: speaking and writing
Computer programs		Microsoft Office, SAP R3-RH;
		SPSS, AMOS, SmartPLS and WarpPLS; Qualtrics.
Additional information		
		Member of the Portuguese Psychologists' Order (registration nr. 6566)

A l e x a n d r a   M a r i a   M i r a n d a   P i n h e i r o   M a r t i n s

45 anos	E-mail: alexmmartins@sapo.pt
Casada (1 filho)	alexandra_martins@iscte.pt
Portuguesa	

Habilitações Académicas

2007/2013	A concluir Doutoramento em Psicologia (defesa prevista para 2013)
	ISCTE-IUL - Instituto Universitário de Lisboa
	Tema: Inteligência Emocional
	Orientador: Prof. Doutor Nelson Campos Ramalho – ISCTE-IUL
	Coorientadora: Prof. Doutora Estelle Morin – HEC Montreal (Canadá)
2002/2005	Mestrado em Psicologia Social e Organizacional
	ISCTE-IUL - Instituto Universitário de Lisboa
	Tema: Cultura Organizacional e Gestão do Conflito Interpessoal
	Orientador: Prof. Doutor José Gonçalves das Neves
	Classificação final: Muito Bom.
1986/1991	Licenciatura em Psicologia - Ramo de Psicologia Social (15 valores)
	Faculdade de Psicologia e de Ciências da Educação - Universidade de Lisboa

Experiência Profissional

No Ensino Superior

2011/2012	ISCTE-IUL - Instituto Universitário de Lisboa
2009/2010	Escola de Ciências Sociais e Humanas
(2 semestres)	Colaboração com o Prof. Doutor Nelson Ramalho na preparação e docência da unidade curricular optativa de Inteligência Emocional - Mestrado em Psicologia das Emoções.
Abril/2002 a	IPS - Instituto Politécnico de Setúbal
Fevereiro/2008	ESCE - Escola Superior de Ciências Empresariais
(6 anos)	Departamento de Comportamento Organizacional e de Gestão de Recursos Humanos
	Docente das disciplinas de Relacionamento Interpessoal (aulas teóricas e práticas), Princípios de Gestão de Recursos Humanos (aulas práticas)

e Recrutamento & Seleção (aulas teóricas e práticas).

Participação no Júri de Seleção dos Maiores de 23 anos.

Orientação de estágios dos finalistas do curso de Gestão de Recursos Humanos.

Participação em diversos júris para discussão de relatórios de estágio de projetos organizacionais aplicados.

	Nas Organizações
Maio/1997 a Abril/2002 (5 anos)	Modelo Continente Hipermercados, SA (Grupo SONAE) Técnica de Recrutamento e Selecção de operadores de loja, quadros técnicos e chefias, elaboração de anúncios, cartazes e outros meios de divulgação, triagem curricular, realização de entrevistas de selecção, aplicação e cotação de testes psicológicos, elaboração de relatórios de selecção e de avaliação psicológica.
Junho/1995 a Dezembro/1996 (18 meses)	Registrade - Informação, Comunicação e Serviços, SA (Grupo PT) Técnica de Formação: diagnóstico das necessidades de formação, elaboração do plano de formação, contactos com entidades formadoras, implementação e acompanhamento do plano de formação, avaliação das ações de formação, elaboração do manual de acolhimento e integração (português e inglês), colaboração na gestão administrativa de pessoal.
Dezembro/1992 a Março/1995 (27 meses)	Homens & Sistemas, Lda. (Consultoria em Gestão e Recursos Humanos) Departamento de Marketing (17 meses): organização e gestão da base de dados de clientes, selecção de alvos comerciais para execução de mailings e contactos, coordenação dos contactos comerciais da empresa, leitura e análise da imprensa especializada em negócios e empresas, press releases, recolha de informações sobre a concorrência, reformulação dos materiais para divulgação dos serviços da empresa, contactos e negociação com fornecedores de material publicitário. Departamento de Recrutamento e Selecção (4 meses): triagem curricular, testes psicológicos, provas de grupo, entrevistas, relatórios. Departamento de Comunicação (6 meses): organização e divulgação de seminários, lançamento de uma metodologia de formação para efectivos de baixa qualificação, produção de vídeos didáticos para formação.

Março/1992 a Novembro/1992 (8 meses)	Centro de Formação Profissional para o Sector Alimentar (IEFP) Técnica de Recrutamento e Selecção de formandos para os cursos ministrados pelo centro: anúncios de recrutamento, entrevistas, testes psicológicos, avaliação do perfil dos candidatos e sua selecção, colaboração na avaliação de candidatos a formadores.

Formação Ministrada

Outubro/2010	Workshop: "Introducing Emotional Intelligence to Project Managers" (3h) - IBS-ISCTE Business School Ciclo de Conferências e Workshops de Gestão de Projetos APOGEP (Associação Portuguesa de Gestão de Projetos)
Setembro/2010	"Negociação e Gestão de Conflitos" (módulos de 30h)
Setembro/2009	AFA - Academia da Força Aérea - Base Aérea Nº1 (Pêro Pinheiro)
Outubro/2007	Alunos do Estágio Técnico-Militar
Outubro/2006	

Comunicações Apresentadas

	No âmbito do programa doutoral
Setembro/2011	"The warped relationships between personality, emotional intelligence, academic success and well-being" - 3rd International Congress on Emotional Intelligence - Opatija (Croácia)
Julho/2011	"A new look at Schutte's et al. (1998) Emotional Intelligence Scale" - ISSID 2011 - International Society for the Study of Individual Differences - University of London (UK)
Setembro/2009	"Does being emotionally intelligent mean being healthy? Extending previous meta-analytic findings"- II Congreso Internacional de Inteligencia Emocional – Santander (Espanha)
Maio/2009	"Emotional intelligence: Testing a new model and measure"- 14th European Congress of Work and Organizational Psychology - Santiago de Compostela (Espanha)
Agosto/2008	"L'intelligence émotionnelle ou comment perdre son latin" - 15ème congrès de Psychologie du Travail et des Organisations - AIPTLF - Association Internationale de Psychologie du Travail de Langue Française - Université de Laval – Québec (Canadá)
	Outras

Setembro/2010	"A Inteligência Emocional no Contexto da Gestão de Projetos"
	Semana do Gestor de Projeto - APOGEP (Associação Portuguesa de Gestão de Projetos) – CCB-Centro Cultural de Belém (Lisboa)
Maio/2007	"Preparação para a Entrevista de Seleção
Maio/2006	Ciclo de Workshops "Preparação para a Vida Ativa"
	ESCE-Escola Superior de Ciências Empresariais - Instituto Politécnico de Setúbal
Janeiro/2006	"Cultura Organizacional e Conflito Interpessoal na Marinha Portuguesa" - Ciclo de Seminários da Escola Naval
	Marinha Portuguesa - Departamento de Fuzileiros (Alfeite)
Maio/2005	"Como candidatar-se a um emprego"
	Seminário "O futuro do Engenheiro Eletromecânico"
	EST-Escola Superior de Tecnologia - Instituto Politécnico de Setúbal
Outubro/2004	"Cultura Organizacional e Gestão de Conflito: A Influência da Cultura Organizacional na Abordagem do Conflito Interpessoal"
	Encontro Nacional de Investigação em Psicologia Social e Organizacional (VI Mestrado em Psicologia Social e Organizacional)
	ISCTE-IUL - Instituto Universitário de Lisboa
Julho/2003	"Interpersonal relationship needs, locus of control and stress: presentation of an interpretation model"
	Stress Star: 24th International Conference on Stress and Anxiety – Stress and Anxiety Research Society
	FIL - Feira Internacional de Lisboa (Parque das Nações)

Publicações Científicas

2010	Martins, A., Ramalho, N. & Morin, E. (2010). A comprehensive meta-analysis of the relationship between Emotional Intelligence and health. *Personality and Individual Differences*, *49* (6), 554-564.

Formação Metodológica

Adquirida no âmbito do programa doutoral

2011	Multi-level analysis in Psychological research using SPSS - Leoniek Wijngaards-de Meij (12h)
	Content analysis: The statistical analysis of text and open-ended responses - Nicole Kronberger (6h)

2010	Writing and publishing in scientific journals – Lynn Shore (3h)
2009	Moderação e Mediação com SEM – Cícero Pereira (15h)
	Modelos Lineares II: Regressão Linear Múltipla - Helena Carvalho (18h)
	Writing & Reviewing Scientific Papers - Thomas Schubert (8h)
	Modelos Lineares I: n-way ANOVA e n-way MANOVA - Helena Carvalho (18h)
2008	Análise Fatorial Confirmatória - Cícero Pereira (18h)
	Publishing in International Scientific Journals - Miriam Erez (6h)
	Meta-Analysis - Tirza Leader (18h)
	Análise Multi-Level - Vicente González Romá (18h)

	Complementar
Março/2010	Structural Equation Modeling (SEM) with WarpPLS - Geoffrey S. Hubona (4h) - Online
Dezembro/2009	Structural Equation Modeling (SEM) with Partial Least Squares (PLS) path modeling using SmartPLS - Geoffrey S. Hubona (7h) - Online

Formação Profissional nas Organizações	
Janeiro/2000	FIAH – Formação Intensiva em Animação de Homens (2 dias) - Dynargie – Luso
Setembro/1999	Certificação na utilização de Testes de Aptidões e de Personalidade da SHL Portugal – Lisboa
1999	Certificação na utilização do Teste de Personalidade APP - SGRH Thomas International – Lisboa
Outubro/1998	Quadros Dinérgicos (4 dias) - Dynargie – Lisboa
Janeiro a Março/1997	Formação de Formadores - Nível 1 (72 h) - CECOA – Lisboa Certificado de Aptidão Profissional
Setembro a Novembro/1996	Desenvolvimento de Quadros: Liderança, Gestão de Tempo e Apresentações em Público - EXODUS-TMI – Estoril
Junho/1995	Microsoft Office - Sight Portuguesa Informática – Lisboa
Novembro/1994	Telemarketing - Homens & Sistemas – Lisboa
Janeiro a Fevereiro/1993	Informática, A Empresa/A Organização/O Management, Comportamento Organizacional - Programa J.T.I. (Jovens Técnicos para a Indústria) - INETI – Lisboa

Novembro/1992	Workshop sobre Programação Neurolinguística - Prof. Dr. Lair Ribeiro - SINASE – Lisboa
Março/1991	Workshop sobre Assessment Centres - Dr. Hélio Moreira - EGOR Gestão e Finanças, Lda. - Lisboa

Conhecimentos Adicionais

Inglês	Bons conhecimentos ao nível da compreensão e expressão (oral e escrita).
	Prática de apresentações em congressos internacionais e de leitura e escrita de artigos científicos em Inglês.
1986	Frequência dos níveis PA1 e PA2 do "Proficiency" British Council - Lisboa
1985	Diploma "First Certificate in English" da Universidade de Cambridge British Council - Lisboa
Francês	Conhecimentos médios ao nível da compreensão e expressão (oral e escrita).
2008	Frequência de aulas particulares de Francês para preparação da comunicação apresentada no Québec ILA - Instituto de Línguas de Algés (Lisboa)
Espanhol	Alguns conhecimentos ao nível da compreensão e expressão (oral e escrita).
Informática	Microsoft Office, SAP R3-RH; SPSS, AMOS, SmartPLS e WarpPLS; Qualtrics.

Outras Informações

	Inscrita da Ordem dos Psicólogos – Cédula Profissional nº 6566