

Repositório ISCTE-IUL

Deposited in *Repositório ISCTE-IUL*:

2022-11-28

Deposited version:

Accepted Version

Peer-review status of attached file:

Peer-reviewed

Citation for published item:

Godinho, S. & Garrido, M. V. (2020). The "ins" and "outs" of product and services marketing: The influence of consonant wanderings in consumer decision-making. *Psychology and Marketing*. 37 (10), 1352-1361

Further information on publisher's website:

10.1002/mar.21384

Publisher's copyright statement:

This is the peer reviewed version of the following article: Godinho, S. & Garrido, M. V. (2020). The "ins" and "outs" of product and services marketing: The influence of consonant wanderings in consumer decision-making. *Psychology and Marketing*. 37 (10), 1352-1361, which has been published in final form at <https://dx.doi.org/10.1002/mar.21384>. This article may be used for non-commercial purposes in accordance with the Publisher's Terms and Conditions for self-archiving.

Use policy

Creative Commons CC BY 4.0

The full-text may be used and/or reproduced, and given to third parties in any format or medium, without prior permission or charge, for personal research or study, educational, or not-for-profit purposes provided that:

- a full bibliographic reference is made to the original source
- a link is made to the metadata record in the Repository
- the full-text is not changed in any way

The full-text must not be sold in any format or medium without the formal permission of the copyright holders.

Running Head: The “ins” and “outs” of product and services marketing

The “ins” and “outs” of product and services marketing: The influence of consonant wanderings in consumer decision-making

Sandra Godinho

CIS-ISCTE, Instituto Universitário de Lisboa

Margarida V. Garrido

CIS-ISCTE, Instituto Universitário de Lisboa

Author’s note:

Correspondence concerning this article should be addressed to Sandra Godinho,

CIS, ISCTE-IUL, Av. das Forças Armadas, 1649-026 LISBOA Portugal,

E-mail: smsgo@iscte-iul.pt

Materials and data supporting the findings are openly available in

https://osf.io/n9kxh/?view_only=d51ed411179b40ce9ba7c21fe890e372.

Acknowledgements

This research reported here was supported by the Fundação para a Ciência e a Tecnologia, Portugal, with grants awarded to the first (SFRH/BD/101804/2014) and the second (PTDC/MHCPCN/ 5217/2014) authors.

NOTICE: this is the author’s version of a work that was accepted for publication in *Psychology & Marketing*. Changes resulting from the publishing process, such as peer review, editing, corrections, structural formatting, and other quality control mechanisms may not be reflected in this document. Changes may have been made to this work since it was submitted for publication. A definitive version was subsequently published as:

Godinho, S., & Garrido, M. V. (2019). The “ins” and “outs” of product and services marketing: The influence of consonant wanderings in consumer decision-making. *Psychology & Marketing*, 37(10), 1352-1361. doi: 10.1002/mar.21384

Abstract

The established preference for words featuring consonants ordered inward in the oral cavity – the in-out effect, may assist marketeers when naming new products and services. To investigate the conditions under which this effect may affect consumer preference we conducted four experiments ($N=818$) examining the influence of consonant wanderings in the evaluation of different professionals and food products. While inward articulation direction selectively biased warmth judgments about workers who are perceived as relatively neutral on both warmth and competence, for professionals traditionally associated with either a warmth or a competence dimension inward-wandering usernames systematically presented a competitive advantage. In the same way, hypothetical food products with inward-wandering names were judged as more hedonic and more utilitarian. The present evidence supports the potential of the in-out effect to market products and services and highlights the relevance of exploiting this and other oral kinematics phenomena as an asset for managerial practice.

Keywords: in-out effect, oral kinematics, embodiment, consumer decision-making.

Market success is contingent to the brand’s name (Kohli & LaBahn, 1997). Thus, one of the greatest challenges when launching new products and services is how to name them. To address such concern, researchers have consistently examined the characteristics that make brand names effective, that is, which names entice consumers to buy the product (e.g., Grewal et al., 1998), believe that it is more effective (e.g., Klink, 2001), value it higher (e.g., Argo et al., 2010; Coulter & Coulter, 2010) or even remember it better (e.g., Lowrey et al., 2003). While some research has focused on exploring how the name conveys meaningful associations and other information about the products’ characteristics (e.g., Aaker & Keller, 1990; Keller et al., 1998; Klink, 2001), other lines of research have focused in the basic psychological mechanisms that facilitate brand recognition, pronunciation memory or preference (e.g., Lee & Baack, 2014; Robertson, 1989). Within this latter approach, several linguistic devices are being tested to design new brand names that enhance consumer liking for a product or a service such as manipulating vowels (e.g., Klink & Athaide, 2012) or consonants (e.g., Yorkston & Menon, 2004). Recently, in this quest to find effective brand names, a new chapter that explores surprising oral-muscular effects was open – the Oral Kinematics.

Our orofacial musculature combines three fundamental functions. It assists feeding, that is, ingesting aliments or spitting harmful substances, produces speech and, simultaneously, communicates emotions - trough smile or other facial expressions. Oral kinematics approaches build upon this multifunctional nature to propose that the articulatory movements required for speech production convey meaning to words because they match particular movements (e.g. the activation of the zygomaticus major muscle, that is involved in smiling when pronouncing /i:/ sounds, Rummer et al., 2014). One of such approaches, a motivational one, examines the match between oral articulatory movements and two primary survival functions, ingestion and expectoration (Rozin, 1996). The research conducted on the so-called in-out effect (Topolinski et al., 2014) has recently demonstrated that words whose articulation involve inward wandering

kinematics, similar to ingestion movements (e.g., IBUK), are preferred to words where the muscular contractions wander outward, that is, similar to expectoration movements (e.g., KIDUB). Since consonantal phonemes are articulated in precise locations in the oral cavity, from the throat to the lips (e.g., Ladefoged, 2001; Maddieson, 1984), the articulation of the word BIC that includes a bilabial consonant (e.g., [b]) and a velar consonant (e.g., [k]), produces an inward wandering simulating an ingestion movement, while a word such as GAP, starting with a velar consonant followed by a bilabial consonant, wanders in the opposite direction, that is outwards, resembling an expectoration oral movement.

Such affect has been proven to be independent on whether those words refer to nonsense words (e.g., Godinho & Garrido, 2019), names or usernames of ordinary persons (e.g., Garrido et al., 2018), fictitious characters (e.g., Topolinski et al., 2014), or foods (e.g., Godinho et al., 2018). Particularly relevant for the marketing services domain, Silva and Topolinski (2018) tested names for online sellers in the context of an Ebay online auction to discover that sellers with inward names were rated as more trustworthy and preferred for economic transactions. Also, in the marketing context, Godinho and Garrido (2017) have found that logos and product packages with inward wandering names were consistently preferred over those having outward names associated, leading to the conclusion that the effect may be useful to promote brands for different product types.

To further explore the potential of the in-out effect to assist marketing professionals in developing and selecting new brand names (Topolinski, 2017), the current set of four experiments was designed to provide insights on whether the preference for inward wandering names may present a competitive advantage in the services marketing domain, triggering consumer preference for specific professionals, as well as in the Fast-Moving Consumer Goods market (FMCG), examining its potential to name products. Indeed, since previous evidence reported possible

boundary conditions, the present research endeavors were much need to confidently support the application of the in-out effect to marketing.

Relevant (Marketing-Wise) Boundary Conditions

The in-out effect was initially established as an oral approach-avoidance mechanism through which orally induced sensorimotor experiences were shown to bias preference evaluations (Topolinski et al., 2014). Despite its modest effect sizes (e.g. $d_z = .14$ when naming edible products Godinho et al., 2018; $d_z = .40$ when naming brands or $d_z = .29$ for products Godinho & Garrido 2017), the effect seems extremely robust. Indeed, the in-out effect was already replicated across several languages and language families namely Indo-European languages such as Portuguese (Godinho & Garrido, 2016), German and English (Topolinski et al., 2014), as well as Turkish and Ukrainian (Godinho et al., 2019) the former belonging to the Turkic language family and the second with a different non-Latin written alphabet (Cyrillic). These consistent replications have provided some preliminary evidence of the effects’ stability since it is observable across these languages, with several writing systems and in diverse cultural contexts. Additionally, the effect was shown to be triggered with minimal manipulations (Topolinski & Boecker, 2016a), that is, with two phoneme words (e.g., BAKU vs. KABU), plain letter strings (e.g., BK vs. KB) or even with stimuli presented very briefly (e.g., 50 ms, Gerten & Topolinski, 2018). Moreover, further confirming its robustness, the effect was shown to be resistant both to motor interference (Lindau & Topolinski, 2018) caused by concurrent oral tasks such as chewing bubble gum and to competing visual information (Godinho & Garrido, 2017) provided by logos or product packaging. Despite all this evidence supporting the effects’ stability, successful modulations have been also reported and, importantly, they present relevant implications for marketing and managerial practice.

The first boundary condition relates to the seminal explanation of the mechanism underlying the effect - the resemblance of the oral movements involved in word articulation and ingestion/expectoration oral movements. Indeed, there seems to exist a match between inward and outward movements and the oral movements associated respectively with ingestive (e.g., lemonade, mouthwash) or expectorative (e.g., chemicals, bubble gum; Topolinski, et al., 2017) products. Thus, when judging inward or outward names for consumer products, the products' function appeared to be determinant. In a subsequent clarification of this functional explanation for the in-out effect, Godinho, Garrido Zürn and Topolinski (2019) found that participants preferred inward words more than outward for edible products (water, beer, fuzzy drink), but not for non-edible products (shampoo, detergent, bleach). Since the preference for inward-wandering names only seems to emerge when naming edible products, it may be useless to select inward names for non-edible products.

While examining the in-out effect in the context of competing visual information, Topolinski and Boecker (2016b) found that, when used to name images of foods that were high on palatability cues (e.g., photos of appealing food dishes), inward-wandering words did not grant a higher appraisal of the stimuli. This finding suggests that articulation direction may be ineffective fostering consumer preference when presented simultaneously with vivid and suggestive visual information. However, subsequent research by Godinho and Garrido (2017) demonstrated that the in-out effect persists with common marketing brand imagery such as the logo or packaging. Since only extremely stimulating visual information seems to carry diagnostic information powerful enough to disrupt the articulation direction effect, this second boundary condition does not present a threat to the potential application of the in-out effect to marketing practice.

Very recently, Körner, Bakhtiari and Topolinski (2018), suggested the role of motor fluency in shaping the in-out effect and demonstrated that training outward articulation sequences could block or even invert the established preference for inward wandering ones (see Godinho &

Garrido, 2019 and also Maschmann et al., 2020 for an overview of the state of the art).

Independently of the debate surrounding the origin of the effect, these findings demonstrate that the in-out effect is permeable to fluency manipulations. From a managerial perspective this means that oral kinematics manipulations may be used as an initial advantage to foster positive feelings towards brands, but that other techniques may be combined (e.g., repeated exposure - Zajonc, 1968) to strengthen or contradict such effects.

Finally, in the person perception domain, this preference for inward-consonantal strings has been recently shown to only affect judgments pertaining a warmth (but not a competence) dimension (Garrido et al., 2019). Such evidence plays alongside with previous reports on the marketing domain where the effect was rehearsed as a competitive advantage for online sellers' usernames, demonstrating that inward consonantal wanderings increase perceived trustworthiness (Silva & Topolinski, 2018).

The present research aims to provide support for the application of the in-out effect to marketing as a novel way to assist the design of new brand names, by exploring whether such a simple sensorimotor experience may bias judgments of mock usernames of services providers and of names of FMCG. Evidence was collected across four experiments where participants were asked to rate usernames of professionals that are relatively neutral in both warmth and competence (Experiments 1 and 2), professionals that are traditionally associated with either warmth or competence traits (Experiment 3) as well as names of hypothetical food products (Experiment 4).

Experiments 1 and 2

The first two experiments shared the same materials and procedures, to examine the in-out influence in the evaluation of mock usernames belonging to professionals with no particular association to a warmth or a competence dimension. Experiment 1 featured a between-participants

design, where the warmth and competence trait ratings were rated separately to establish the effect without potentially confounding the dependent variables. In Experiment 2 participants completed both, warmth and competence ratings (within-participants design). In line with previous evidence (Garrido et al., 2019), we expected that inward usernames would increase warmth but not competence ratings.

Method

Power Analysis and Sampling Plan. Sample sizes were determined before data collection with G*Power (Faul et al., 2007). In Experiment 1, presenting a between-participants design, the power analysis was based on the average effect size of Cohen’s $d_z = 0.40$ obtained in Garrido et al., (2019; Experiment 1c – warmth evaluations, between-participants design). For Experiment 2 the same analysis was based in Cohen’s $d_z = 0.23$ obtained in Experiments 2a of the same article (within-participants design). The sample sizes required to replicate the in-out effect with a statistical power of 0.90 were $N = 54$ and 164, respectively. Since data collection was set to stop at the end of the day in which the sample reached these numbers, more data was collected.

Participants. Eleven participants in Experiment 1 and one in Experiment 2 were discarded for being non-Portuguese native speakers or bilinguals. None of the valid participants reported any valid suspicion of the manipulation. The final samples included 83 Portuguese-speaking participants ($M_{age} = 30$, $SD = 15.3$; 48 female; $N_{warmth} = 39$; $N_{competence} = 44$) in Experiment 1 and 199 ($M_{age} = 28$, $SD = 11.6$; 154 female) in Experiment 2.

Stimuli. Forty-eight inward and outward-words were randomly selected from a larger stimulus pool, validated for the Portuguese phonation (Godinho & Garrido, 2016, please see the supplemental material). These pre-tested words were merged with @gmail.com resulting in usernames such as bateco@gmail.com (inward) or catebo@gmail.com (outward). A pre-test ($N =$

85) validated our selection of the target professional group (customer service assistant for a mobile telecommunications company) - in the warmth versus competence dimension, $t(84)=1.71, p = .089$.

Procedure. All data was collected according to the host institution ethical guidelines.

Emails were randomly collected online from giveaways competitions, schools, public services or private companies contact listings to send invitations for participant recruitment. Some invitations were sent through private messages to known and random users in social media platforms such as Facebook and Instagram, being each receiver requested to join the sending chain to produce a snowball effect. After entering the Qualtrics platform, reading and agreeing with the informed consent, participants were informed that the study was designed to understand the way people perceive usernames of professionals. They were also informed there were no right or wrong answers and that they should silently read the usernames before rating them. While participants in Experiment 1 were asked to complete the ratings regarding their perceived ‘warmth’ or ‘competence’ (1 *Not warm at all* to 10 *Very warm*; 1 *Not competent at all* to 10 *Very competent*; between-participants design) in Experiment 2 participants were asked to do both ratings (within-participants design). Please note that consonantal articulation direction was in both experiments manipulated within-participants, meaning that each participant rated usernames wandering inward and outward. The final design was therefore, 2 Consonantal articulation direction (inward vs. outward usernames, within-participants) X 2 Trait (warmth vs. competence, between- participants in Exp. 1, and within-participants in Exp. 2).

In Experiment 1 each participant was presented a random sample of 48 usernames (24 inward and 24 outward) while in Experiment 2 with 28 usernames (14 inward and 14 outward), one at the time. As in all our previous experiments on the in-out effect, there was no time limit to complete the ratings and the stimuli were visible until the answer was provided. After the ratings, participants were asked socio-demographic questions such as gender, age and native language, and two control questions aiming to detect possible manipulation awareness (Godinho & Garrido,

2016). We report all measures and manipulations, meaning that no other data was collected during the experimental procedure.

Results

Experiment 1. A repeated-measures analysis of variance (ANOVA) was conducted using the average score of the ratings given to inward and to outward usernames, to determine the effect of the consonantal direction articulation (within-participants) of the usernames on participants' perception of their warmth and competence (between-participants)¹.

The consonantal articulation direction of the usernames exerted a significant impact on participants' judgments, $F(1,81) = 5.90, p = .017, \eta_p^2 = .07, 95\% \text{ CI } [0.00, 0.19]$. Usernames wandering inward ($M = 4.24, SE = .18$) were rated higher than those wandering in the opposite direction ($M = 4.09, SE = .17$). There was also a marginal effect of the trait being evaluated, $F(1,81) = 3.84, p = .054, \eta_p^2 = .05, 95\% \text{ CI } [0.00, 0.16]$, showing higher ratings for competence ($M = 4.50, SE = .24$) than for warmth ($M = 3.82, SE = .25$). Importantly, the interaction between articulation direction and the trait being rated was significant, $F(1,81) = 15.86, p < .001, \eta_p^2 = .16, 95\% \text{ CI } [0.04, 0.30]$. As the pairwise comparisons revealed, articulation direction of the usernames did not inform competence judgments ($M_{inward} = 4.46, SE = .24, M_{outward} = 4.55, SE = .24$), but was relevant for warmth judgments, being inward usernames rated as warmer ($M = 4.01, SE = .28$) than those wandering in the opposite direction ($M = 3.63, SE = .28$), $t(38) = 4.70, p < .001, d_z = 0.75, 95\% \text{ CI } [0.39, 1.11]$.

Experiment 2. A repeated-measures analysis of variance (ANOVA) was conducted using the average score of the ratings given to inward and to outward usernames, to determine the effect

¹ Materials and data from all experiments can be found at https://osf.io/n9kxh/?view_only=d51ed411179b40ce9ba7c21fe890e372

of the consonantal direction articulation (within-participants) of the usernames on participants' perception of their warmth and competence (within-participants). This analysis revealed a similar pattern of results. Consonantal articulation direction of the usernames presented a main effect $F(1,198) = 4.93, p = .028, \eta_p^2 = .02, 95\% \text{ CI } [0.00, 0.08]$, with higher ratings for inward-wandering ($M = 4.41, SE = .11$) than for outward-wandering usernames ($M = 4.31, SE = .11$). The trait being rated also presented a significant main effect, $F(1,198) = 8.00, p = .005, \eta_p^2 = .04, 95\% \text{ CI } [0.00, 0.10]$, indicating that competence ratings were higher ($M = 4.43, SE = .11$) than warmth ones ($M = 4.30, SE = .11$). The interaction between articulation direction and the trait being rated was also statistically significant, $F(1,198) = 3.95, p = .048, \eta_p^2 = .02, 95\% \text{ CI } [0.00, 0.07]$. This interaction revealed that articulation direction did not affect participants' perception of competence ($M_{inward} = 4.44, SE = .11, M_{outward} = 4.42, SE = .11; t(198) = .39, p = .696$), but only their perception of warmth, $t(198) = 2.89, p = .004, d_z = 0.21, 95\% \text{ CI } [0.06, 0.35]$. Usernames with inward wanderings ($M = 4.38, SE = .12$) were rated higher in the warmth dimension than those wandering outward ($M = 4.20, SE = .12$).

Overall these results unveil the impact that the in-out effect may have in increasing preference for particular services providers. Moreover, previous findings (Garrido et al., 2019), suggesting that while judgments of warmth are affected by consonantal wandering direction, competence judgments remain unaffected, were replicated.

Experiment 3

Experiments 1 and 2 examined the in-out effect in the services marketing domain, by asking participants to rate the warmth and competence of usernames of professionals that are relatively neutral in these dimensions. Results supported previous evidence in the person perception domain. Nevertheless, social reality is far more complex than neutral characters or professionals.

In Experiment 3, the impact of consonantal wandering direction was tested for professional groups traditionally associated with either the warmth or the competence dimensions (Fiske & Dupree, 2014). The procedure was identical to the one used in the previous experiments, but participants were asked to judge four distinct professionals’ (nurse and childcare worker, lawyer and accountant). In line with previous evidence and the results from Experiments 1 and 2, we expected that inward usernames would increase likability and warmth but not competence ratings.

Method

Power Analysis and Sampling Plan. As in the previous experiments, sample size was defined prior to data collection. We used the size of Cohen's $d_z = 0.31$ obtained in Garrido et al., (2019) also featuring randomized ratings. The required sample size to replicate the effect with a statistical power of 0.90 was $N = 91$. Since Experiment 3 included between-participants ratings (liking, warmth and competence), we set that number per condition ($N_{\text{Total}}=273$). Again, because data collection was established to stop at the end of the day that the sample reached this number, the sample became slightly larger.

Participants. Two participants were excluded, one for not being English native speaker and the other for failing to report his/her native language². None of the remaining participants reported any valid suspicion of the manipulation. The final sample included 282 English-speaking participants ($M_{\text{age}} = 35$, $SD = 12.2$; 196 female; $N_{\text{preference}} = 86$; $N_{\text{warmth}} = 97$; $N_{\text{competence}} = 99$).

Stimuli. Sixty inward and outward words (word list available in the supplemental material) were randomly selected from a stimulus pool pre-tested for English phonation (Topolinski et al., 2014). Like in the former two experiments, inward and outward wandering words were merged with @gmail.com, resulting in usernames such as opinaki@gmail.com (inward) and okidapi@gmail.com (outward).

² Experiments 3 and 4 were run with English native speakers because data was collected using the Prolific platform. Nevertheless, the native language of this sample does not present any hazards since the in-out effect has been conveniently established across several languages (e.g., Godinho & Garrido, 2016; Godinho et al., 2019; Topolinski et al., 2014).

The inward and outward-wandering usernames and each of the four professional groups selected were presented together. The selection of the professional groups was supported by the classical matrix where occupational groups are classified alongside warmth and competence dimensions (Fiske & Dupree, 2014). A subsequent pilot ($N = 29$) validated our selection of the target professional groups - in the warmth versus competence dimension (1 - *Warmth related profession* to 10 - *Competence related profession*). Accordingly, nurse and childcare worker were elected as professions traditionally associated with the warmth ($M = 4.98$), whilst accountant and lawyer with the competence dimension ($M = 8.93$), $t(28) = -9.12, p < .001$.

Procedure. Participants were recruited through Prolific platform to join a survey examining how people evaluate online usernames for different professional groups. Data was collected according to the host institution ethical guidelines. After being recruited in Prolific, participants were directed to the Qualtrics platform and asked to read and agree with the informed consent stating that all data treatment would be anonymous and used for scientific purposes only.

Participants were asked to silently read and rate a total of 48 usernames, 12 for each professional group (6 inward and 6 outward). Participants were randomly distributed across the three conditions, that is, each participant rated either the usernames perceived likeability (1 - *Do not like it at all* to 10 - *Like it very much*), warmth (1 - *Not warm at all* to 10 - *Very warm*) or competence (1 - *Not competent at all* to 10 - *Very competent*). The final design presented a 2 Consonantal articulation direction (inward vs. outward, within-participants) X 3 Trait (likeability vs. warmth vs. competence, between-participants). The order of the ratings was randomized. At the end participants were asked to complete the same socio-demographic questions and control questions to detect possible awareness of word manipulation as in previous experiments. We report all measures and manipulations, meaning that no other data was collected during the experimental procedure.

Results

A repeated-measures analysis of variance (ANOVA) using the average score of the ratings given to inward and to outward usernames, revealed a main effect of consonantal articulation direction on participants' evaluations of the usernames, $F(1,279) = 90.28, p < .001, \eta_p^2 = .25, 95\% \text{ CI } [0.16, 0.32]$. Participants provided higher ratings for inward ($M = 4.65, SE = .10$) than outward-wandering usernames ($M = 4.29, SE = .10$). No main effect of the type of profession being rated was observed, $F(1,279) = 1.23, p = .269$, that is, participants' ratings did not differ for professions traditionally associated with a warmth (nurse, childcare worker) versus a competence dimension (accountant, lawyer).

Interaction effects were found between articulation direction and the trait being rated, $F(1,279) = 5.84, p = .003, \eta_p^2 = .02, 95\% \text{ CI } [0.00, 0.06]$, and between articulation direction and the professional group under scrutiny, $F(1,279) = 3.47, p = .063, \eta_p^2 = .01, 95\% \text{ CI } [0.00, 0.05]$. The first interaction revealed that the in-out effect was larger in likeability ratings ($M\bar{\delta} = .540, p < .001$) than in warmth ($M\bar{\delta} = .265, p < .001$) or competence ratings ($M\bar{\delta} = .261, p < .001$). The second interaction, despite marginal, suggested that the difference between the ratings given to inward-wandering versus outward usernames was larger when participants were judging competence-related occupations (accountant and lawyer, $M\bar{\delta} = .407, p < .001$) as opposed to warmth-related occupations (nurse and child care worker, $M\bar{\delta} = .303, p < .001$).

These results reveal that the in-out effect may play an even more relevant role in the services marketing domain than the previous examination of more neutral occupations would lead us to predict. The apparently irrelevance of the in-out effect for competence judgments observed in previous research and conveniently replicated across Experiments 1 and 2, seems to be only valid for professional groups with no particular association with a warmth or competence dimension. When the professional group under scrutiny is somehow associated with any of the core dimensions of social perception, this modulation fails to emerge. In real life scenarios, where consumers must

choose between professionals from diverse backgrounds, the articulatory direction is expected to cross-cut general likeability, social warmth and competence judgments.

Experiment 4

Experiments 1, 2 and 3 examined the in-out effect in the services marketing domain, testing whether the systematic modulation of consonantal wanderings is a reliable method to increase preference for different professionals through their online usernames. Due to the size-wise powerful samples and the consistency observed in the results it was possible to corroborate the relevance of the effect for the services context. Experiment 4 was specifically designed to test the effect with FMCG.

Consumer attitudes resulting from a shopping experience may be assessed on both hedonic and utilitarian dimensions (Babin et al, 1994). Thus, just like the warmth and competence dimensions are at the core of person perception, hedonic and utilitarian dimensions are relevant to characterize consumer attitudes towards products (Botti & McGill, 2011). While one pertains to a more emotional side of consumption, the other is better defined as the rational aspect of consumer judgment focusing on objective characteristics such as usefulness.

Based on the previous results, that is, the relevance of consonant articulation direction for warmth but not competence judgments of neutral characters or professional groups, we expected that consonantal articulation would only be pertinent for the evaluation of hypothetical brand names for unspecified food products in an affective product type dimension. In other words, the affective in-out manipulation would only be relevant for hedonic (vs. utilitarian) judgments. Indeed, previous research has demonstrated that there is a congruency between the type of ad (affective or rational) and the type of product (hedonic vs. utilitarian) advertised (e.g., Drolet et al., 2007), being affective ads only diagnostic for hedonic products (Schwarz & Clore 1983).

Method

Power Analysis and Sampling Plan. Prior to data collection, we used the Cohen's $d_z = 0.32$ obtained in a food naming experimental setting by Topolinski and Boecker (2016b; Experiment 1) to estimate the sample size required to replicate the in-out effect with a statistical power of 0.90 ($N = 86$). Because the ratings (liking, hedonic and utilitarian) were between-participants, we established that number per condition ($N_{\text{Total}} = 258$). Despite using the same data-collection stopping rule defined in the previous experiments, data exclusions lead to a slightly smaller final sample.

Participants. Four participants were excluded for not being English native speakers. No more exclusions were made because no one reported a valid suspicion of the manipulation. The final sample included 254 English speaking participants ($M_{\text{age}} = 34$, $SD = 10.9$; 170 female, 1 undisclosed gender; $N_{\text{preference}} = 87$; $N_{\text{warmth}} = 78$; $N_{\text{competence}} = 89$).

Stimuli. Sixty inward and outward-words randomly selected from the stimulus pool pre-tested for English phonation included in Topolinski et al. (2014) were used as potential names for food products to be launched in the market.

Procedure. After being recruited in Prolific to join a survey examining how people evaluate names for food products, participants were directed to the Qualtrics platform and asked to read and agree with the informed consent stating that all data treatment would be anonymous and used for scientific purposes only. Data was, collected according to the host institution ethical guidelines.

As in Experiments 1 and 2, participants were requested to rate a “neutral” stimulus, that is, a name for a food product that is not associated with a particular hedonic or utilitarian dimension. The instructions were adapted for the product scenario and to the judgment required:

Likeability Judgment – “Silently read each name and rate it as fast and spontaneously as possible regarding how much you like it as a name for a new FOOD PRODUCT. Please give your answer in a scale from 1 - *Do not like it at all* to 10 - *Like it very much*”;

Hedonism Judgment– “Silently read each name for a new FOOD PRODUCT and rate it as fast and spontaneously as possible regarding the hedonistic nature that it conveys about the product. By hedonistic judgment we mean, how much you believe the name conveys the image of a food product that is pleasant, fun, enjoyable or appealing to the senses. Please give your answer in a scale from 1 - *Not hedonistic at all* to 10 - *Very hedonistic*”;

Utilitarian Judgment– “Silently read each name for a new FOOD PRODUCT and rate it as fast and spontaneously as possible regarding the utilitarian nature that it conveys about the product. By utilitarian judgment we mean, how much you believe the name conveys the image of a food product that is useful, practical and performing a specific operation. Please give your answer in a scale from 1 - *Not utilitarian at all* to 10 - *Very utilitarian*”;

Each participant randomly rated 30 names (15 inward and 15 outward) in a 2 Consonantal articulation direction (inward vs. outward, within-participants) X 3 Judgment (likeability vs. hedonic vs. utilitarian, between-participants) design. Participants were also asked to complete the same socio-demographic and control questions to detect possible manipulation awareness. We report all the measures and manipulations used.

Results

A repeated-measures analysis of variance (ANOVA) using the average score of the ratings given to inward and to outward usernames, revealed a main effect of consonantal articulation direction on participants’ evaluations of the product’s names, $F(1,251) = 167.04, p < .001, \eta_p^2 = .40, 95\% \text{ CI } [0.31, 0.48]$. Participants provided higher ratings for inward names ($M = 4.32, SE =$

.11) than outward-wandering names ($M = 3.68$, $SE = .11$). No main effect of the type of judgment being made or interaction effects were observed.

In a product domain, more specifically, when addressing potential names for food products, the in-out effect presents itself very robustly across all the rating types requested. Thus, contrary to our predictions, the in-out effect is also observed in judgments regarding a rational, utilitarian dimension. Products' names wandering inward in the oral cavity were consistently perceived as more likeable, hedonistic and utilitarian.

Meta-analysis. To better establish the magnitude of the in-out effect in more affective (warmth / hedonistic) or more rational (competence/utilitarian) judgments across services and products we conducted a meta-analysis gathering data from Experiments 1, 2 and 4, that included judgments about “neutral” products or services. Please note that because only affective and rational ratings were included, preference ratings from Experiment 4 were not considered.

All the analyses were conducted in JASP (Version 0.9, JASP Team, 2018). To estimate the parameters in the model, the restricted maximum likelihood-method was used. As for the potential moderating variables, we examined the judgment type (affective vs. rational) and the judgment target (services vs. products). In total, six effect sizes were included in the meta-analysis, three for affective and three for rational judgments (including four ratings for services - Experiments 1 and 2 - and two for products - Experiment 4).

The results from the meta-analysis yielded a small but significant overall effect size of $d = .137$ ($p = .027$), 95% CI [0.015, 0.259] which indicated that the in-out effect is relevant for overall judgments.

The forest plot depicting the effect sizes of all studies is displayed in Figure 1. Combined effect sizes are represented by the central vertical axis of the diamonds, and the 95% confidence intervals by the span of the horizontal axis.

[INSERT FIGURE 1 HERE]

Despite the lack of heterogeneity of the effects sizes ($Q(5) = 5.680$, $p = .339$; $I^2 = 14.42\%$, 95% CI: 0.00% and 87.07%), since we are dealing with very similar studies, we analyzed judgment target (service and product) and the judgment type (affective vs rational) as moderators (Table 1). The judgment target showed a significant effect, implying that the in-out effect is consistently larger when participants are selecting a name for hypothetical food products ($d = .329$) than for services ($d = .063$).

[INSERT TABLE 1 HERE]

The stronger effect of consonant articulation in hedonic and utilitarian ratings of food products further strengthens the hypothesis that the in-out effect might have an eating-related explanation. Indeed, this strong association might have been the reason why the in-out effect was surprisingly observed in the utilitarian judgments made about the hypothetical food products. We will explore this reasoning further in the discussion.

Discussion

In four experiments we show that consonantal articulation direction may be used to influence perceptions of service providers and products. Inward-wandering usernames and product-names, that in their articulation resemble the oral ingestion of aliments, consistently triggered positive evaluations more intensely than those featuring outward-wandering sequences, similar to expectoration movements. Moreover, while Experiments 1 and 2 replicated an already known modulation - the absence of this established preference for inward-wandering consonantal sequences in competence ratings, Experiments 3 and 4 demonstrated that the in-out effect might cue judgment beyond affective dimensions.

The results observed in Experiment 3 suggest that the boundary condition previously found for judgments about neutral stimuli seems to happen only in the absence of relevant information about the target-person. Previous research in the person perception domain suggests that when judging a neutral target in the absence of relevant information, consonant wandering may act as an important cue that informs warmth ratings (Garrido, et al, 2019). This is arguably the case because while competence inferences seem not to rely in intuitive System 1 judgments (Willis & Todorov, 2006), attractiveness, likeability or trustworthiness evaluations are often made instantly, after minimal exposure times. In other words, affective judgments about other individuals require minimal inferential activity (Zajonc, 1980). However, when more information is known about the target, namely about the warmth or the competence typically associated to a given professional group, this affective cue seems to inform all the judgments (preference, warmth but also competence).

In Experiment 4, inward-wandering names combined with neutral food products, biased judgments about both affective (hedonism) and rational (utilitarianism) dimensions. Assuming that the inward-preference results from an oral-approach avoidance mechanism inherited from a survival instinct (Topolinski et al., 2014), it may be the case that, in the context of food products, the oral manipulation becomes highly diagnostic (see Godinho et al., 2018, Experiment 4).

Taken together, our findings reveal that subtle articulatory manipulations may have a substantial role when naming both new products and services, while providing new insights on how to accomplish such benefits. Previous brand name design research seems to have been excessively dependent on the examination of artificial targets (Lowrey & Shrum, 2007) while our research conveniently expands previous evidence to more complex targets that, similarly to real contexts, pertain valenced information.

Moreover, it seems that brand name design may have been too dependent upon sound symbolism literature alone (Klink, 2000). Since these approaches are not divergent, our findings

suggest that future research should explore the existing common ground. Aside from their shared fit into an embodiment framework, because sound symbolism associations are acquired and used while perceiving and interacting with the environment, both approaches have been proven culturally agnostic (e.g., Shrum et al., 2012; Godinho et al., 2019). So, as a starting point future research could depict the existing evidence provided by sound symbolism research focusing specifically on the characteristics that particular consonants could convey to brands. Sound symbolism researchers have found, for instance, that brand names with voiced obstruents may be perceived as harsher by opposition to those with voiceless consonants that are perceived as softer or milder (Pathak et al., 2020), or that brands with silent consonants could convey human characteristics metaphorically associated with environmental friendliness such as good-heartedness or humility, (e.g., Joshi & Kronrod, 2019). Acknowledging that the in-out effect relies similarly in consonantal phonemes, how do these divergent approaches combine? Should we perspective them as divergent or do these effects may be combined to increase the effects' size?

Brand equity depends upon a complex set of variables, with brand name design corresponding to only one among the several possible strategies to increase it (Roche et al., 2015). Indeed, the acknowledgment that a disproportionate number of brand names starts with the phonemes [c], [p], and [k] (Schloss, 1981) does not oblivate the existence of successful brands whose names start with other letters (Pathak et al., 2019), nor does it explain the raise and decline of Kodak brand, for example, whose name starts with a voiceless velar stop. Thus, by evidencing that “motoric patterns” in word articulation induce positive feelings towards brands and services, we are not presenting a magical recipe for brand success but unveiling one possible ingredient to assist the creation of new brands for saturated markets. Future research measuring the competitive value of all the variables contributing for brand equity is much needed and welcomed in the future.

Marketing actions dependent upon brand name design are obviously limited. It is indisputable that from a managerial perspective the alteration of a logo, or other brand features, is

easier than changing a brand name. Also, despite the prevailing tradition amongst small services companies for the commercial name to correspond to the family name or for an email address to include its holder name, we believe that oral kinematics valuable insights may still present competitive advantage. Besides the obvious support to name new brands entering the market, it can more broadly inform the writing of other marketing elements such as claims or brand signatures for already established brands.

Finally, we acknowledge the modest effect size of the in-out effect, which was conveniently replicated in the present metanalysis ($d = .14$). The in-out effect presents a highly replicable manipulation, whose humble effect-size does not shade its potential impact. Marketing equity pertains, as we have seen, to a complex merge of marketing elements most of them falling under the consumers’ conscious scrutiny. The in-out effect and other articulatory manipulations present subtle ways to trigger preference without consumers awareness or any extra investment, being easily scalable and adaptable to a worldwide intervention.

The most relevant takeaway message from the current work is the potential of the application of the in–out effect, isolated or in combination with sound symbolism reported effects as well as with other marketing elements, to assist brands expanding internationally to linguistically diverse markets. As far as the in-out effect, as well as other reported motor-to-affect links (e.g., articulatory-feedback, Rummer et al., 2014), may seem from being actual market-assets when presented experimentally with meaningless and odd-sounding words, the robustness of overall oral kinematics findings cannot be ignored. Simple and apparently innocent articulatory manipulations might present the secret ingredient for a global market success.

References

- Aaker, D. A., & Keller, K. L. (1990). Consumer evaluations of brand extensions. *The Journal of Marketing*, *54*, 27-41. <http://dx.doi.org/10.2307/1252171>
- Argo, J. J., Popa, M., & Smith, M. C. (2010). The sound of brands. *Journal of Marketing*, *74*, 97-109. <http://dx.doi.org/10.1509/jmkg.74.4.97>.
- Babin, B. J., Darden, W. R., & Griffin, M. (1994). Work and/or fun: Measuring hedonic and utilitarian shopping value. *Journal of Consumer Research*, *20*, 644-656. <http://dx.doi.org/10.1086/209376>
- Botti, S., & McGill, A. L. (2011). The Locus of choice: Personal causality and satisfaction with hedonic and utilitarian Decisions. *The Journal of Consumer Research*, *37*, 1065–1078. <http://dx.doi.org/10.1086/656570>
- Coulter, K. S., & Coulter, R. A. (2010). Small sounds, big deals: Phonetic symbolism effects in pricing. *Journal of Consumer Research*, *37*, 315-328. <http://dx.doi.org/10.1086/651241>
- Drolet, A., Williams, P., & Lau-Gesk, L. (2007). Age-related differences in responses to affective vs. rational ads for hedonic vs. utilitarian products. *Marketing Letters*, *18*, 211-221. <http://dx.doi.org/10.1007/s11002-007-9016-z>
- Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G* Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, *39*, 175-191. <http://dx.doi.org/10.3758/BF03193146>
- Fiske, S. T., & Dupree, C. (2014). Gaining trust as well as respect in communicating to motivated audiences about science topics. *Proceedings of the National Academy of Sciences*, *111* (Supplement 4), 13593-13597. <http://dx.doi.org/10.1073/pnas.1317505111>

- Garrido, M. V., Godinho, S., & Semin, G. R. (2019). The “ins” and “outs” of person perception: The influence of consonant wanderings in judgments of warmth and competence. *Journal of Experimental Social Psychology*, 82, 1-5. <http://dx.doi.org/10.1016/j.jesp.2018.11.004>
- Gerten, J., & Topolinski, S. (2018). Exploring the temporal boundary conditions of the articulatory in–out preference effect. *Psychological Research*. <http://dx.doi.org/10.1007/s00426-018-1095-3>
- Godinho, S., & Garrido, M. V. (2016). Oral approach-avoidance: a replication and extension for European–Portuguese phonation. *European Journal of Social Psychology*, 46, 260-264. <http://dx.doi.org/10.1002/ejsp.2172>
- Godinho, S., & V Garrido, M. (2017). Branding with the in–out effect: The impact of consonantal articulation on brand evaluation. *Psychology & Marketing*, 34, 904-911. <http://dx.doi.org/10.1002/mar.21031>
- Godinho, S., & Garrido, M. V. (2019). The in–out effect: examining the role of perceptual fluency in the preference for words with inward-wandering consonantal articulation. *Psychological Research*, 1-9. <http://dx.doi.org/10.1007/s00426-019-01238-7>
- Godinho, S., Garrido, M. V., & Horchak, O. (2019). Oral approach-avoidance: A replication and extension for Slavic and Turkic phonations. *Experimental Psychology*, 66, 355-360. <https://doi.org/10.1027/1618-3169/a000458>
- Godinho, S., Garrido, M. V., Zürn, M., & Topolinski, S. (2018). Oral kinematics: Examining the role of edibility and valence in the in-out effect. *Cognition and Emotion*, 33, 1094-1098. <http://dx.doi.org/10.1080/02699931.2018.1532874>
- Grewal, D., Krishnan, R., Baker, J., & Borin, N. (1998). The effect of store name, brand name and price discounts on consumers' evaluations and purchase intentions. *Journal of Retailing*, 74, 331-352. [https://doi.org/10.1016/S0022-4359\(99\)80099-2](https://doi.org/10.1016/S0022-4359(99)80099-2)

- Joshi, P., & Kronrod, A. (2019). Sounds of green: How brand name sounds metaphorically convey environmental friendliness. *Journal of Advertising, 49*, 61-77.
<https://doi.org/10.1080/00913367.2019.1696720>
- Keller, K. L., Heckler, S. E., & Houston, M. J. (1998). The effects of brand name suggestiveness on advertising recall. *The Journal of Marketing, 62*, 48-57. doi:10.2307/1251802
- Klink, R. R. (2000). Creating brand names with meaning: The use of sound symbolism. *Marketing Letters, 11*(1), 5-20. <https://doi.org/10.1023/A:1008184423824>
- Klink, R. R. (2001). Creating meaningful new brand names: A study of semantics and sound symbolism. *Journal of Marketing Theory and Practice, 9*, 27-34.
<https://doi.org/10.1080/10696679.2001.11501889>
- Klink, R. R., & Athaide, G. A. (2012). Creating brand personality with brand names. *Marketing Letters, 23*(1), 109-117. <https://doi.org/10.1007/s11002-011-9140-7>
- Kohli, C., & LaBahn, D. W. (1997). Creating effective brand names: A study of the naming process. *Journal of Advertising Research, 37*, 67-75. <https://doi.org/10.1.1.200.4395>
- Körner, A., Bakhtiari, G., & Topolinski, S. (2019). Training articulation sequences: A first systematic modulation of the articulatory in–out effect. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 45*, 1725-1732.
<https://doi.org/10.1037/xlm0000669>
- Ladefoged, P. (2001). *Vowels and consonants: An introduction to the sounds of languages*. Blackwell Publishers.
- Lee, S., & Baack, D. W. (2014). Meaning or sound? The effects of brand name fluency on brand recall and willingness to buy. *Journal of Promotion Management, 20*, 521-536.
<https://doi.org/10.1080/10496491.2014.946203>
- Lindau, B., & Topolinski, S. (2018). The articulatory in-out effect resists oral motor-interference. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 44*, 209-220.
<https://doi.org/10.1037/xlm0000443>

- Lowrey, T. M., & Shrum, L. J. (2007). Phonetic symbolism and brand name preference. *Journal of Consumer Research*, 34(3), 406-414. <https://doi.org/10.1086/518530>
- Lowrey, T. M., Shrum, L. J., & Dubitsky, T. M. (2003). The relation between brand-name linguistic characteristics and brand-name memory. *Journal of Advertising*, 32, 7-17. <https://doi.org/10.1080/00913367.2003.10639137>
- Maddieson, I. (1984). *Patterns of sounds*. Cambridge University Press.
- Maschmann, I. T., Körner, A., Boecker, L., & Topolinski, S. (2020). Front in the mouth, front in the word: The driving mechanisms of the in-out effect. *Journal of Personality and Social Psychology*. Advance online publication. <http://dx.doi.org/10.1037/pspa0000196>
- Pathak, A., Calvert, G. A., & Lim, L. K. (2020). Harsh voices, sound branding: How voiced consonants in a brand's name can alter its perceived attributes. *Psychology & Marketing*. <https://doi.org/10.1002/mar.21346>
- Pathak, A., Velasco, C., & Spence, C. (2019). The sound of branding: An analysis of the initial phonemes of popular brand names. *Journal of Brand Management*, 27, 339-354. <https://doi.org/10.1057/s41262-019-00183-5>
- Robertson, K. (1989). Strategically desirable brand name characteristics. *Journal of Consumer Marketing*, 6, 61-71. <https://doi.org/10.1108/EUM0000000002563>
- Rozin, P. (1996). Towards a psychology of food and eating: From motivation to module to model to marker, morality, meaning, and metaphor. *Current Directions in Psychological Science*, 5, 18-24. <https://doi.org/10.1111/1467-8721.ep10772690>
- Rummer, R., Schweppe, J., Schlegelmilch, R., & Grice, M. (2014). Mood is linked to vowel type: The role of articulatory movements. *Emotion*, 14, 246-250. <https://doi.org/10.1037/a0035752>
- Schloss, I. (1981). Chickens and pickles. *Journal of Advertising Research*, 21 (6), 47-49.

- Shrum, L. J., Lowrey, T. M., Luna, D., Lerman, D. B., & Liu, M. (2012). Sound symbolism effects across languages: Implications for global brand names. *International Journal of Research in Marketing*, 29(3), 275-279. <https://doi.org/10.1016/j.ijresmar.2012.03.002>
- Silva, R., & Topolinski, S. (2018). My username is IN! The Influence of inward versus outward wandering usernames on judgments of online seller trustworthiness. *Psychology & Marketing*, 35, 307-319. <https://doi.org/10.1002/mar.21088>
- Topolinski, S. (2017). Articulation patterns in names: A hidden route to consumer preference. *Journal of the Association for Consumer Research*, 2, 382-391. <https://doi.org/10.1086/692820>
- Topolinski, S., & Boecker, L. (2016a). Minimal conditions of motor inductions of approach-avoidance states: The case of oral movements. *Journal of Experimental Psychology: General*, 145, 1589-1603. <https://doi.org/10.1037/xge0000217>
- Topolinski, S., & Boecker, L. (2016b). Mouth-watering words: Articulatory inductions of eating-like mouth movements increase perceived food palatability. *Appetite*, 99, 112-120. <https://doi.org/10.1016/j.appet.2016.01.018>
- Topolinski, S., Boecker, L., Erle, T. M., Bakhtiari, G., & Pecher, D. (2017). Matching between oral inward–outward movements of object names and oral movements associated with denoted objects. *Cognition and Emotion*, 31, 3-18. <https://doi.org/10.1080/02699931.2015.1073692>
- Topolinski, S., Maschmann, I. T., Pecher, D., & Winkielman, P. (2014). Oral approach–avoidance: Affective consequences of muscular articulation dynamics. *Journal of Personality and Social Psychology*, 106, 885-896. <https://doi.org/10.1037/a0036477>
- Willis, J., & Todorov, A. (2006). First impressions: Making up your mind after a 100-ms exposure to a face. *Psychological Science*, 17, 592–598. <https://doi.org/10.1111/j.1467-9280.2006.01750.x>

Yorkston, E., & Menon, G. (2004). A sound idea: Phonetic effects of brand names on consumer judgments. *Journal of Consumer Research*, *31*(1), 43-51. <https://doi.org/10.1086/383422>

Zajonc, R. B. (1968). Attitudinal effects of mere exposure. *Journal of Personality and Social Psychology*, *9*, 1-27. <https://doi.org/10.1037/h0025848>

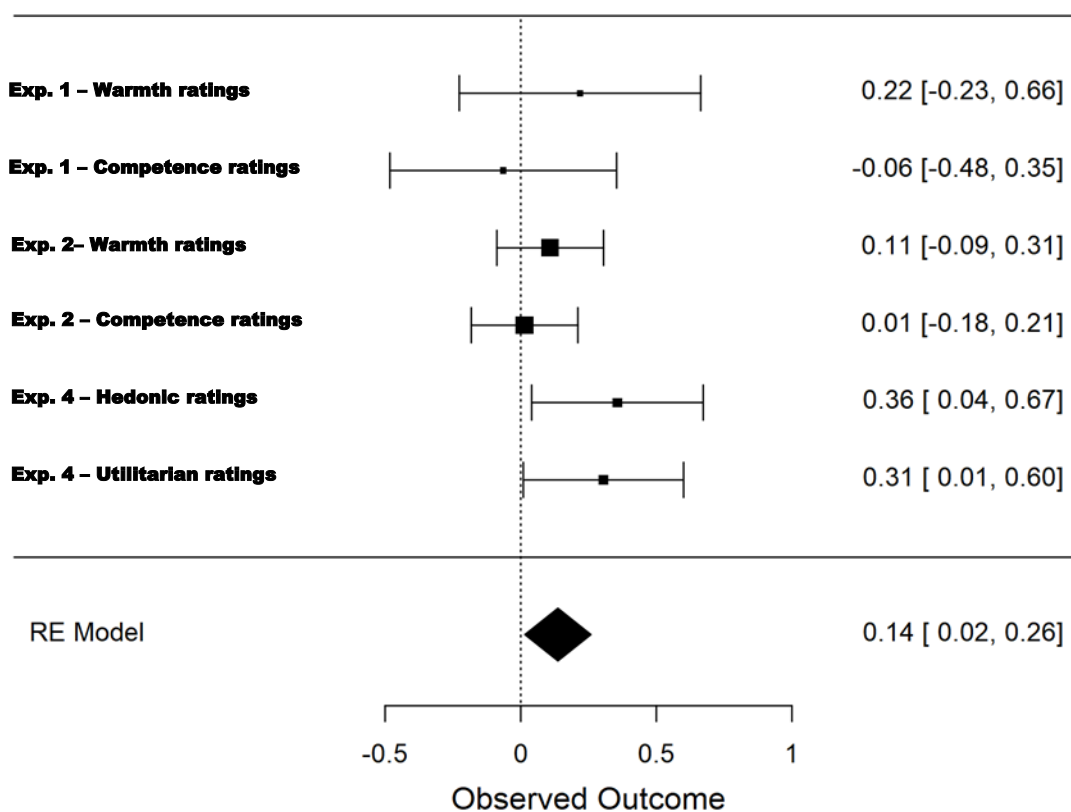
Zajonc, R. B. (1980). Feeling and thinking: Preferences need no inferences. *American Psychologist*, *35*, 151–175. <https://doi.org/10.1037/0003-066X.35.2.151>

Table 1
Results for moderators (bivariate models).

Moderators	Mean <i>d</i> (95% CI)	β (95% CI)	<i>F</i> (df1, df2) ^a	<i>p</i> ^b
<i>Judgment target</i>			4.355 (1, 4)	.037*
Product	0.329 (0.113, 0.545)			
Service	0.063 (-0.064, 0.189)	-0.266 (-0.517, -0.016)		
<i>Judgment type</i>			0.635 (1, 4)	.426
Affective	0.089 (-0.098, 0.276)			
Rational	0.198 (0.006, 0.389)	0.109 (-0.159, 0.377)		

Figure 1

Forest plot – In-out effect.



Supplemental material

Experiments 1 and 2

<i>Inward Usernames</i>	<i>Outward Usernames</i>
ABATEGO@gmail.com	ACANEFO@gmail.com
ABOTICA@gmail.com	ACANEFA@gmail.com
AFANECO@gmail.com	ACOTIBA@gmail.com
AFANECA@gmail.com	AGATEBO@gmail.com
AVATEGO@gmail.com	AGATEVO@gmail.com
BATECO@gmail.com	CATEBO@gmail.com
EBANECO@gmail.com	CATEVO@gmail.com
EFADECO@gmail.com	ECADEFO@gmail.com
EFONECA@gmail.com	ECANEBO@gmail.com
EVANECO@gmail.com	ECANEVO@gmail.com
FUNEGA@gmail.com	ECONEFA@gmail.com
FUTIGO@gmail.com	GUNEFA@gmail.com
IBANEGO@gmail.com	GUTIFO@gmail.com
IBONICA@gmail.com	ICONIBA@gmail.com
IFONEGA@gmail.com	ICONIVA@gmail.com
IVANEGO@gmail.com	IGANEBO@gmail.com
IVONICA@gmail.com	IGANEVO@gmail.com
OBADECO@gmail.com	IGONEFA@gmail.com
OPONECA@gmail.com	OCADEBO@gmail.com
OVADECO@gmail.com	OCADEVO@gmail.com
UBADEGO@gmail.com	OCONEPA@gmail.com
UFATECO@gmail.com	UCATEFO@gmail.com
UVADEGO@gmail.com	UGADEBO@gmail.com
VATECO@gmail.com	UGADEVO@gmail.com

Experiments 3 and 4

<i>Inward Usernames</i>	<i>Outward usernames</i>
OBIDAK@gmail.com	EKITEBO@gmail.com
MODEKA@gmail.com	AKETUB@gmail.com
FINUKU@gmail.com	EKITUB@gmail.com
POTOKE@gmail.com	KOLOFE@gmail.com
MODOKE@gmail.com	IKUSAP@gmail.com
FOLOK@gmail.com	AKEDUFE@gmail.com
MITUKU@gmail.com	KILUP@gmail.com
FILUKU@gmail.com	IKULEBA@gmail.com
OBIDEK@gmail.com	KESUF@gmail.com
FATAKO@gmail.com	EKILEFO@gmail.com
EPISEKO@gmail.com	KUNEB@gmail.com
IBUTAK@gmail.com	AKENUP@gmail.com
BULEKA@gmail.com	IKULABU@gmail.com
OBITAKI@gmail.com	UKANAPO@gmail.com
MESUK@gmail.com	IKUNEP@gmail.com
FOLEK@gmail.com	IKUTEM@gmail.com
BASAKO@gmail.com	EKITEF@gmail.com
BOSEKA@gmail.com	EKITUP@gmail.com
BUDEKA@gmail.com	IKUDAFU@gmail.com
BALAK@gmail.com	AKENUFE@gmail.com
IBUSAKU@gmail.com	KANAF@gmail.com
OFISAKI@gmail.com	KISEF@gmail.com
BOSOK@gmail.com	OKIDAPI@gmail.com
BILEKO@gmail.com	KUDAB@gmail.com
OFINAK@gmail.com	IKUNAMU@gmail.com
OPINAKI@gmail.com	EKILEP@gmail.com
OPISEKA@gmail.com	KUTEF@gmail.com
MOSOKE@gmail.com	KIDEB@gmail.com
FISEKO@gmail.com	KONEP@gmail.com
FADAKO@gmail.com	AKOTOB@gmail.com

