Journal of Consumer Research Advance Access published October 21, 2015

Positioning Rationality and Emotion: Rationality Is Up and Emotion Is Down

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Emotion and rationality are fundamental elements of human life. They are abstract concepts, often difficult to define and grasp. Thus throughout the history of Western society, the head and the heart, concrete and identifiable elements, have been used as symbols of rationality and emotion. Drawing on the conceptual metaphor framework, we propose that people understand the abstract concepts of rationality and emotion using knowledge of a more concrete concept—the vertical difference between the head and heart. In six studies, we show a deep-seated conceptual metaphorical relationship linking rationality with "up" or "higher" and emotion with "down" or "lower." We show that the association between verticality and rationality/emotion affects how consumers perceive information and thereby has downstream consequences on attitudes and preferences. We find the association to be most influential when consumers are unaware of it and when it applies to an unfamiliar stimulus. Because all visual formats—from the printed page to screens on a television, computer, or smartphone—entail a vertical placement, this association has important managerial implications. Our studies implement multiple methodologies and technologies and use manipulations of logos, websites, food advertisements, and political slogans.

Keywords: rationality, emotion, vertical placement, conceptual metaphor, marketing communication, visual persuasion, object positioning

Emotion and rationality are fundamental elements of human life. Their definition, their functioning, and their relation are ageless questions that have preoccupied humans for thousands of years (Kirman, Livet, and Teschl 2010). Emotions greatly affect the quality and meaning of our existence, whereas rationality helps us organize our beliefs and optimize the outcomes of our actions (de Sousa 2014). And yet rationality and emotions are not independent of each other (Cosmides and Tooby 2000; De Sousa 1990) because emotions are, in fact, often rational. However, scientific evidence concerning the interplay between rationality and emotions, on the one hand, and people's perception and naive understanding of rationality and emotions, on the other, are different issues. How do we understand rationality and emotion—concepts that we can neither touch nor see? The conceptual metaphor framework (Lakoff and Johnson 1999; Landau, Meier, and Keefer 2010) asserts that people understand abstract domains via more concrete domains of knowledge. That is, according to a metaphor-enriched perspective, people conceptualize abstract concepts in terms of more concrete concepts.

Applying the conceptual metaphor framework and idea of scaffolding to rationality and emotion, we note that from

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Laura Peracchio and Gita Johar served as editors, and Andrea Morales served as associate editor for this article.

Advance Access publication September 18, 2015

 • Vol. 0 • 2015
DOI: 10.1093/jcr/ucv046

childhood, humans tend to associate two "concrete" body parts—the head and the heart—with the more "abstract" concepts of rationality and emotion, respectively. For instance, in *The Wizard of Oz*, the Tin Woodman desires a heart because he is without emotions, and Scarecrow desires a brain because he lacks intelligence. In many children's books and movies, the same connection is made, and a character often points to his head when thinking and to his heart when expressing love. Thus over time we develop the conceptual link of rationality with "up" or "higher" and emotion with "down" or "lower." This argumentation also has historical support from the ancient times of Plato's and Virgil's teachings, to Aquinas's medieval time's philosophy to the more recent writings of Shakespeare and Descartes. Although people structure abstract concepts metaphorically, these metaphorical links are not necessarily expressed linguistically (Casasanto 2009). In the case of the association of rationality with up and emotion with down, some linguistic examples follow the conceptual metaphor. Indeed, in normal conversation, figures of speech depicting rational versus emotional behaviors often invoke verticality (e.g., "the discussion *fell* to the emotional *level*, but I *raised* it back up to the *rational* plane").

Although rationality and emotion as drivers of human behavior have been intensively researched in consumer behavior, decision making, economics, neuroscience, philosophy, and psychology (e.g., Damasio 1994; Evans and Cruse 2004; Fetterman and Robinson 2013; Greenspan 1988; Pham 2007; Shiv and Fedorikhin 1999; Zajonc 2000), previous research has not examined their relationship with physical verticality. A metaphorical link between verticality and rationality/emotion would cause the same information to be perceived as more rational or more emotional depending on where it was placed along the vertical dimension. The link may also create expectations for where on a plane people would presume to see more rational or more emotional stimuli. The metaphorical association would have implications in many domains because all visual presentation formats—from the printed page to screens on a television, computer, or smartphone—entail a vertical placement. We test for the proposed metaphorical association in six studies. These studies test (1) the existence of verticality's association with rationality/emotion, (2) the properties of this association, (3) the boundary conditions of the association, and (4) the association's downstream effects.

We first test the existence of a proposed conceptual metaphor and show that people do, indeed, associate up with rational and down with emotional. Second, we explore the association's properties. Specifically, we find the metaphorical link to be bidirectional such that spatial placement can influence perceptions of rationality versus emotion, much as the rational versus emotional quality of material influences its preferred spatial placement. Third, we show the association is most influential when consumers are unaware of it and when they are less familiar with the stimulus. Finally, we demonstrate that the manipulation of this association affects how consumers perceive information and has downstream consequences on attitudes and preferences. We begin by discussing literature pertinent to our research. We then build the conceptual framework for our hypothesized effects. We next describe six studies. We conclude by addressing specific contributions of the research and future directions.

THEORETICAL BACKGROUND AND CONCEPTUAL FRAMEWORK

Literature relevant to our research falls in the areas of conceptual metaphors and scaffolding, prior metaphorical associations connected to verticality (valence, power, and morality), verticality's association with rationality/emotion, effects of the metaphorical match on attitudes, and possible moderating effects for verticality's association with rationality/ emotion. We briefly discuss each in turn.

Conceptual Metaphors and Scaffolding

*Conceptual Metaphors.*Cognitive linguists Lakoff and Johnson (1980, 1999) argue that a metaphor is a cognitive tool that allows people to communicate what they cannot see, taste, hear, smell, or touch. In their view, a conceptual metaphor can be understood as a mapping (a precise set of correspondences) from a source domain to a target domain (Lakoff 1993). The source domain represents the concrete knowledge that an individual gleans from experiences with the physical world (e.g., love is a *journey*), whereas the target domain represents the conceptual and abstract domain that is more difficult to grasp (e.g., *love* is a journey; Lakoff and Johnson 1980). These mental associations allow people to use pieces of knowledge coming from a concrete and commonplace source domain (e.g., *journey*) to interpret, understand, and manipulate information associated with the abstract target domain (e.g., *love*). For example, the metaphor might lead one to think of a lover as a fellow traveler, or of a shared life goal as a destination. Such metaphors guide how people interpret relationship events and the same event can take on different meaning, with different downstream consequences, depending on which metaphor is brought to bear on it (Lee and Schwarz 2014b).

Literature in psychology and consumer behavior is rich in works on conceptual metaphors, showing how subtle incidental physical and sensory experiences can unconsciously affect metaphorically related targets. Physical height is one type of concrete experience that has come to be linked metaphorically to a number of abstract concepts. Position in vertical space (i.e., that some stimuli are physically higher than others) is omnipresent. Thus it is coopted

for multiple metaphorical associations (Lakoff and Johnson 1999; Meier et al. 2007), such as valence, power, and morality. Testing for the link between verticality with valence, Meier and Robinson (2004) had participants evaluate words presented on a computer screen. Results showed that participants evaluated positive words faster when they were on the top of the screen versus the bottom. For negative words, the effect was the opposite. In terms of power, Schubert (2005) found that people were quicker to recognize stimuli representing power when they appeared at the top versus the bottom of the page. Similarly, in a series of studies, Giessner and Schubert (2007) changed the length of a vertical line that separated the leader from the rest of the employees in an organization chart, and then they asked participants to estimate the leader's power. The authors found that as the length of the line increased, so did participants' estimation of the leader's power. With respect to morality, Meier, Sellbom, and Wygant (2007) found that people more quickly recognize words with a moral meaning (e.g., caring, charity, nurture, truthful, and trustworthy) when those words appear at the top of the screen. Conversely, people more quickly recognize words with an immoral meaning (e.g., adultery, corrupt, dishonest, evil, and molest) when those words appear at the bottom of the screen. Similarly, Meier et al. (2007) found that participants more quickly recognized God-related words when they were associated with up-related words and that the reverse occurred for devil-related words. One needs to be cognizant of these associations when testing for a new metaphorical link with verticality.

Scaffolding. Consistent with the conceptual metaphor framework is the concept of scaffolding (Williams, Huang, and Bargh 2009). Scaffolding, a natural process through which people integrate new concepts with extant knowledge structures (Bargh 2006), proposes that abstract concepts arise from an infant's understanding of its physical environment (Clark 1973; Mandler 1992). Specifically, people acquire physical concepts during their infancy and childhood, and as they become older, they develop more complex and abstract knowledge structures around these early direct experiences, such that the meanings of the older, more basic concept and the newer, higher level concept are linked (Williams et al. 2009; Williams and Bargh 2008a). For example, before children can comprehend the abstract meaning of psychological distance (i.e., interpersonal, emotional), they must perceptually experience these concepts, which they do through physical spatial distance (Williams and Bargh 2008b). Over time, with an incidental activation of the more basic physical concept (which may even occur outside conscious experience), the higher level concept is likely to be activated automatically (Bargh 2006; Williams et al. 2009). For example, priming people with spatial distance (plotting two points on a Cartesian plane) affects how they judge the emotional distance with their family, such that the farther people plotted these points from each other, the weaker were the familial bonds they reported (Williams and Bargh 2008b).

Applying the conceptual metaphor framework and idea of scaffolding to verticality and its associations, we suggest that people have developed the link of "up is rational, and down is emotion" from their childhood experiences and from continuous cultural references, as we next discuss.

Perceptual Representation of Rationality and Emotion

Throughout childhood (at least in Western cultures), we learn that the head and brain are the "location" of rationality, whereas the heart is the "abode" of emotion and feelings (Berendt and Tanita 2011; Fetterman and Robinson 2013; Swan 2009). The association of the heart as a symbol of emotion and the head as a symbol of rationality is continuously reinforced via common language and through media. Hundreds of songs, books, and movies use these metaphors. For example, in the children's movie *Finding Nemo*, Nemo has to solve a problem, and he puts his "fins" to both of his temples to represent the act of thinking; in *Dr. Seuss' How the Grinch Stole Christmas,* when the Grinch is depicted as mean spirited (at the beginning of the movie), his heart is two sizes too small, but when he becomes more caring (at the end of the movie), his heart grows to three times its earlier size. Similarly, in many children's movies, a character points to his head when thinking or to his heart when expressing a strong emotion (see online appendix for further examples).

Everyday physical phenomena tend to corroborate these symbolic associations. For example, we perceive that our heart rate increases when we are experiencing strong emotions (Appelhans and Luecken 2006). In contrast, we commonly attribute mental fatigue and headaches to having "thought too much" about something (Helvig and Minick 2013). Only later in our development do we learn that rationality and emotion both originate in the brain. However, at that point, through repeated experiences and continuous cultural references, evaluations of rationality and emotion may have already become grounded in perceptions of physical verticality, whereby the head is above the heart, and thus rationality is above emotion.

There is also much historical context for such a belief. Notions that thinking is situated on a physically higher level than feeling can indeed be traced throughout the development of Western culture.

Antiquity (7th century BC to 4th century AD). In written text, Plato (5th century BC) is considered the first person to define the head as the portion of the body in which rationality is located while claiming that all emotions are physically located below the neck, and specifically inside our heart (passions) and gut (lower instincts; Finger 2001). In Roman

times, Virgil (1st century BC) in his masterpiece *The Aeneid* guides readers through an analysis of human rationality and emotion that corresponds to Plato's structure (Alvis 1995).

Medieval Period (5th century AD to 15th century AD). Between Antiquity and medieval times, Neoplatonic philosophy was based on the axiom that the human soul consists of a lower irrational soul and a higher rational soul (O'Meara 1978). Aquinas (13th century AD), one of the greatest medieval thinkers, supported the interpretation of reason as something higher than emotions. For Aquinas, emotions could be identified with certain bodily changes, particularly with alterations in the movements of the heart. Aquinas believed that rationality, the element that distinguishes humans from animals, has a corporeal nature, being situated in the middle part of the head (Aquinas, trans. 1981).

Modern Period (16th century AD to 20th century AD). In the early modern period (16th century), the Galenist medical tradition still located rationality in the brain, emotion (particularly anger) in the heart, and desire in the liver (Ballester 2002). Shakespeare's work (16th century) is replete with the heart-versus-head metaphor, attributing rational wisdom to the head and passion to the heart (Swan 2009). Descartes (17th century) continued with this dualistic way of thinking, distinguishing between *res cogitans* (mental substance) and *res extensa* (corporeal substance). Throughout the modern era, the Cartesian separation between *res cogitans* and *res extensa* strengthened the contrast between "reason" and the "heart" (symbol of sentiments, impulses, emotions, and passion that reason could not understand; see discussions by Schmitter 2014 and Damasio 1994). A similar contrast can be found in Freud (19th/20th century), who thought of the human psyche as an iceberg. In his model, the *ego* (the more rational part of the psyche) is represented by the highest part of the iceberg, whereas the lower part of the iceberg represents the *id* (the irrational and emotional part of the psyche; Elliott 2002; Josephs 1997). Finally, in 20th-century sociology, we can find the opposition between "*high*brow" and "*low*brow" culture, in which the first term describes intellectual culture and the latter labels popular culture, represented by things like gossip magazines and emotional novels (Levine 1988).

This historical synopsis helps illustrate why the head and heart are still used as symbols of intellect and emotion, even though we know scientifically now that both rationality and emotion originate in the brain. Thinkers such as Plato, Aquinas, Descartes, Shakespeare, and Freud, and doctrines such as Neoplatonism have had an immense impact on contemporary Western culture, also affecting the development of today's vocabulary (Dodds 1951; O'Meara 1978; Schmitter 2010; Whitehead 1978). In this regard, although a linguistic counterpart is not vital to show that a conceptual metaphor exists (as previously discussed), some expressions in everyday discourse consistently link rationality with up and emotion with down. For instance, the expressions "I *raised* it back up to the *rational* plane," "put your *thinking* cap *on*," and "we had a *high*-level *intellectual* discussion" seem to associate rationality with up. Similarly, "*falling* in *love*," "from the *bottom* of my *heart*," and "*feel* something deep *down*" link emotion with down.

Building on the conceptual metaphor framework and the scaffolding theories, and observing the recurrent cultural presence of beliefs in which thinking is on a higher plane than feelings, we formally hypothesize that:

> **H1:** Rationality is associated with a higher placement than emotion along the vertical dimension.

Metaphorical Match and Evaluative Judgment

Prior research has documented the influence of processing fluency on consumers' evaluations and preferences. Processing fluency is the ease or difficulty with which one processes external information, and it is a largely automatic effect (Clore 1992; Reber, Schwarz, and Winkielman 2004; Schwarz 2004).

Higher (vs. lower) fluency yields a more positive metacognitive experience and sensation (due to the ease of processing), and this positive sensation is often misattributed to the stimulus itself (Schwarz 2004). Consistent with this assumption, prior work has found that fluent processing increases liking (Reber et al. 2004) and consumer preference (Lee and Labroo 2004). Lee and Labroo (2004), for instance, show that participants develop more favorable attitudes toward ketchup when they have been previously presented either with an ad for ketchup or an ad for mayonnaise. This finding presumably reflects that exposure to the preceding stimulus facilitates the subsequent processing of the target stimulus, resulting in a more fluent experience. Note that because fluency is automatic, effortless, and does not require conscious or strategic processing of the stimuli (Bornstein and D'Agostino 1992), it is not measured in these studies but is inferred.

In our context, a match between physical verticality of a stimulus presentation and its rational/emotional nature should result in more fluent processing and, accordingly, more positive evaluations. Thus verticality should not only affect the perception of information in terms of its rationality and emotion, but it should also have downstream consequences on people's evaluations of rational/emotional stimuli. In the marketing literature, we can find further support of how a match (mismatch) between physical position and product information increases (decreases) product evaluation. Deng and Kahn (2009) found that product images placed at the bottom (top) of a package appear to be heavier (lighter). Consequently, the match between position (bottom/top) and products for which heaviness is considered a positive (negative) attribute influenced people's preference toward the product.

Chae and Hoegg (2013) showed that consumers from cultures that read from left to right tend to visualize the past on the left and the future on the right. Then ads containing a match (mismatch) between time and product spatial representation produce more (less) favorable attitudes toward the product.

Building on the preceding literature, we hypothesize the following:

> **H2:** A match (vs. mismatch) of physical verticality and the rational/emotional nature of stimuli will generate more (vs. less) positive evaluations.

Potential Moderators

Although we have found theoretical support for the association between rationality/ emotion and verticality, we believe that some factors should mitigate this conceptual link. Next, we discuss the moderating role of awareness and familiarity.

Association Automaticity and Awareness. Much literature shows how conceptual metaphors derive from an automatic, subconscious, and effortless process (Crawford 2009; Evans and Pourcel 2009; Landau, Meier, and Keefer 2010). To reach such a conclusion, most of the studies use implicit association tests or reaction-time tests (Meier et al. 2007; Meier, Sellbom, and Wygant 2007; Schubert 2005), which are psychological measures aimed at detecting people's automatic association between mental representations of concepts (Robinson 2007). However, a test for automaticity does not provide information relative to what could happen if one were aware of the effect (Bargh 1984). Awareness of the metaphorical association could undermine its automatic nature and hence attenuate its effect, in a similar manner to how awareness has been shown to decrease mood effects (Schwarz 1990, 2012). Schwarz and Clore (1983) demonstrated that subjects reported more overall happiness and satisfaction with their lives when in a good mood (sunny days) than when in a bad mood (rainy days). However, the negative impact of bad moods was eliminated when subjects became aware of the connection between weather and mood. This parallels the observation that accessible knowledge can influence judgment without the person becoming aware of the influence, as observed in numerous priming studies (Higgins 1996). Once the person does become aware of a possible influence, for example, because their attention is drawn to the priming episode (Strack et al. 1993), the otherwise observed effect is attenuated and sometimes reversed (for a review, see Schwarz 2015). Based on the preceding literature, we hypothesize the following:

> **H3:** The metaphorical association between verticality and rationality/emotion will be attenuated when people become aware of the metaphorical association.

Familiarity. Although a match (vs. mismatch) between verticality and rational/emotional connotations can lead to more positive attitudes toward the stimulus, it does not always do so. In some situations, such as when the stimulus is familiar and well known, verticality may not have as large an impact on stimulus interpretation and consequent attitudes toward the stimulus. Brand familiarity indicates the extent of a consumer's experience with a brand, either direct or indirect (Alba and Hutchinson 1987; Kent and Allen 1994), and it captures the consumers' brand knowledge. Although consumers are familiar with many advertised products, they are unfamiliar with many others, either because those brands are new to the marketplace or because consumers have not yet had experience with them (Stewart 1992). When consumers view an ad for an unfamiliar brand, they are more likely to form their opinions about the brand based on the ad's cues (Campbell and Keller 2003; Hilton and Darley 1991). More specifically, in our case, people should rely on metaphors in order to understand seemingly unfamiliar information (Landau, Meier, and Keefer 2010). Consumers viewing an ad for a familiar brand, however, are more likely to use their existing brand knowledge (Campbell and Keller 2003) in evaluating the ad. Accordingly, metaphor effects should be more pronounced when the metaphor guides the interpretation of novel information about an unfamiliar brand than when consumers can draw on existing knowledge about a familiar brand. Prior knowledge and evaluation may therefore attenuate the effect of a metaphorical match on product evaluation. Thus we hypothesize that:

> **H4:** Brand familiarity (i.e., greater familiarity with the brand) will attenuate the effect of the metaphorical match (mismatch) on preferences toward the stimuli.

To test for our four hypotheses, we implement multiple methodologies and technologies: reaction times measured with an Implicit Association Test (IAT, study 1), interpretation of ambiguous stimuli using custom-programmed software (study 2), placement of elements captured through click-data maps (studies 3 and 4), and behavioral intentions utilizing self-reported measures (studies 5 and 6). Next, we discuss our studies.

PILOT STUDY: ADULTS' PERCEPTION OF CHILDHOOD BELIEFS CONCERNING RATIONALITY AND EMOTION LOCATION

Overview and Method

As discussed, we assume that throughout childhood people learn that the head is a symbol of rationality, whereas the heart is the "abode" of emotion. The pilot study tests this assumption using a between-subjects design with two

conditions (emotion vs. rationality). Sixty-two people from an online pool completed the study in exchange for monetary compensation. Participants were shown a 500×500-pixel human silhouette and were asked to recall where, when they were children, they believed emotion (rationality) was "located" in the human body. They used the computer mouse to click on that location in the human silhouette.

The placement of the click, as measured in pixel coordinates, represented our dependent variable of interest. Consistent with our theoretical framework, we predicted that respondents in the rationality condition would click on the head section of the silhouette, whereas participants in the emotion condition would click below, around the heart section.

Results and Discussion

An analysis of variance (ANOVA) with recall (emotion vs. rationality) as the independent variable and pixel coordinates along the vertical axis as the dependent variable revealed that participants placed rationality significantly higher than emotion along the vertical axis ($M_{\text{rationality}} = 426.69$ pixels, $M_{\text{emotion}} = 348.75$ pixels; $F(1, 60) = 186.77$, $p < .01$). As the heat maps show (Figure 1), participants located rationality in the head area of the silhouette, whereas they located emotion in the heart area.

In this pilot test, we show how in childhood, we believe rationality is "located" in the head and that the heart is the "abode" of emotions. Even if we learn later on that rationality and emotion both originate in the brain, our evaluations of rationality and emotion by that time may have already become grounded in perceptions of physical verticality (hypothesis 1). We next discuss our main studies.

STUDY 1: IMPLICIT ASSOCIATION TEST: UP AND RATIONAL, DOWN AND EMOTIONAL

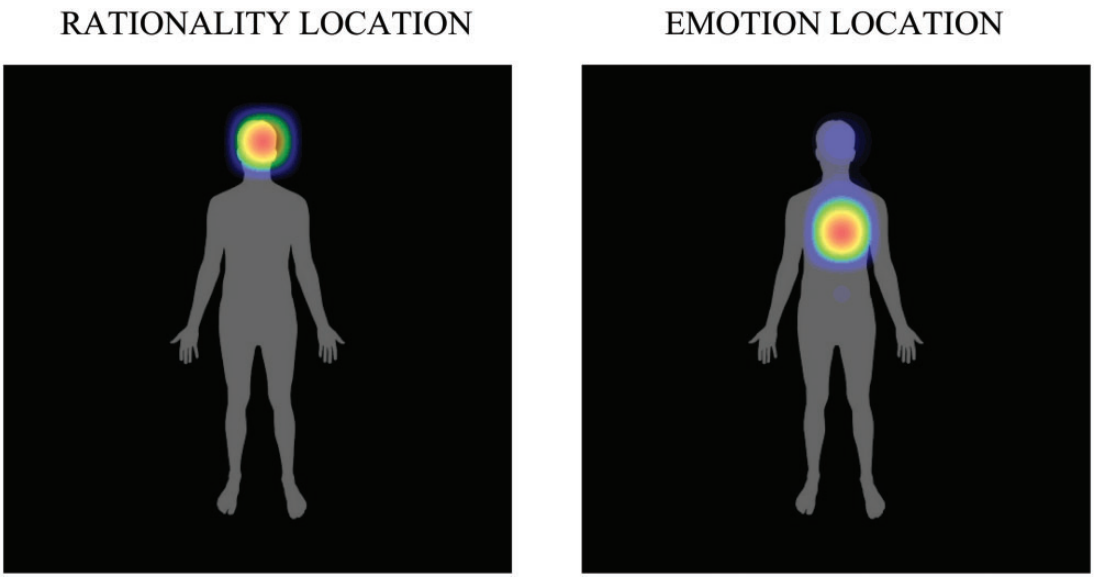
Overview

The IAT (Greenwald, McGhee, and Schwartz 1998) is one of the most commonly used procedures for testing the automaticity of a metaphorical connection (Kawakami at al. 2007; Meier and Robinson 2004; Steidle, Hanke, and Werth 2013). In study 1, we used the IAT to determine whether people implicitly associate up with rational and down with emotional (hypothesis 1). The IAT is a computer-based procedure built on the assumption that tasks requiring responses to unassociated categories take more time to do than identical tasks requiring responses to associated categories. In the IAT, participants see words or stimuli flashed one at a time on a computer screen and are asked to categorize them as belonging to one of two categories that are presented on the same screen.

The IAT. The standard version of the IAT presents subjects with two binary categorization tasks and uses these to infer congruent or incongruent associations (Gawronski 2009; Lane et al. 2007). For example, in research on implicit racial prejudices ("race IAT"), the procedure requires people to categorize faces of European and African origin

FIGURE 1

HEAT MAPS FROM THE PILOT STUDY



in terms of their ethnicity (white/black—first binary categorization task) and to categorize positive and negative words, in terms of their valence (good/bad—second binary categorization task). The IAT presents some "blocks" of stimuli with a single binary categorization task (in which people are asked to group black/white faces *or* good/bad words) and other blocks of stimuli with both binary categorization tasks (e.g., white/black *and* good/bad). The blocks of interest are the latter and are divided into (hypothesized) congruent and incongruent blocks. Specifically, in the prejudice-congruent block participants are asked to group black faces and negative words with one response key, and white faces and positive words with another response key. The opposite combination (black: positive, white: negative) with the same procedure is presented in the prejudice-incongruent block. The assumption underlying the IAT is that the categorization task is easier (and thus quicker) when the two categories that share a response key are congruent rather than when they are incongruent (Nosek, Greenwald, and Banaji 2007). Thus the main dependent variable in this test is the response time (measured in milliseconds) for congruent versus incongruent blocks.

Method

A total of 104 undergraduates from a large university in the midwestern United States completed the study in exchange for course credit. We used four words for each of four categories: rational (*intelligent, logic, reason, thinking*), emotional (*feeling, mood, sentiment, sympathy*), up (*above, over, top, upper*), and down (*below, under, bottom, lower*).

Controls. Word length and frequency: To rule out the possibility that our results were influenced by the words' length or frequency, we compared the words in the *rational* category with the words in the *emotional* category, and the words in the *up* category with those in the *down* category. Word frequencies were calculated using Kucera-Francis norms (Francis and Kucera 1967). We did not find any differences regarding the number of letters or word frequency (p's $> .1$).

Valence of Words. To ensure that our results are not affected by a vertical valence, we also controlled for the valence of the words. For this, we used the NRC Word-Emotion Association Lexicon database (Mohammad and Turney 2010). A Fisher exact test revealed no significant difference in the valence of words in the rational category versus those in the emotional category (p's $> .5$).

Procedure. We followed the IAT standard procedure (Greenwald et al. 1998 for a detailed description).

Category names ("rational"–"emotional" and/or "up"–"down") were placed on the upper left and upper right of the screen. In each block, words included in the two categories appeared in random order in the center of a 14-inch computer screen (in black 18-point Courier New font on a silver background). Figure 2 shows a screenshot taken during the study.

Per the standard, our IAT procedure consisted of five practice blocks and two main blocks (Messner and Vosgerau 2010). Participants had two response key options: "q" if the word appearing in the center of the screen was related to the category on the left, and "p" if the word was related to the category on the right. In the first practice block, the rational category was on the left and the emotional category was on the right. Rational and emotional words appeared in random order on the middle of the screen. Participants pressed the left key (q) when they saw a rational word and the right key (p) when they saw an emotional word. Participants were also asked to answer as quickly and accurately as possible. Incorrect categorizations were signaled using the word *INCORRECT*. A 150-millisecond blank screen followed correct categorizations. Each word remained on the screen until participants made a selection. The second practice block presented the up and down categories. Participants were instructed to press the left response key if the word was related to something that is up, and the right response key if the word was related to something that is down. The third practice block presented the two word lists together. When a rational or up word appeared, participants pressed the left response key; when an emotional or down word appeared, they pressed the right response key.

The task in the fourth block—the *first main IAT block*—was the same as in the third practice block. The response latencies in this fourth block were recorded and labeled as the *congruent block*. The fifth block—another practice block—switched the combination between response keys/categories, such that participants pressed the left response key for emotional words and the right key for rational words. The sixth practice block grouped both word lists together. If participants saw an up or emotional word, they pressed the left key, and if they saw a down or rational word, they pressed the right key. The seventh block—the *second main IAT block (incongruent block)*—was the same as that in the sixth practice block. As in the congruent block, we recorded the response latencies and used them for the analysis.

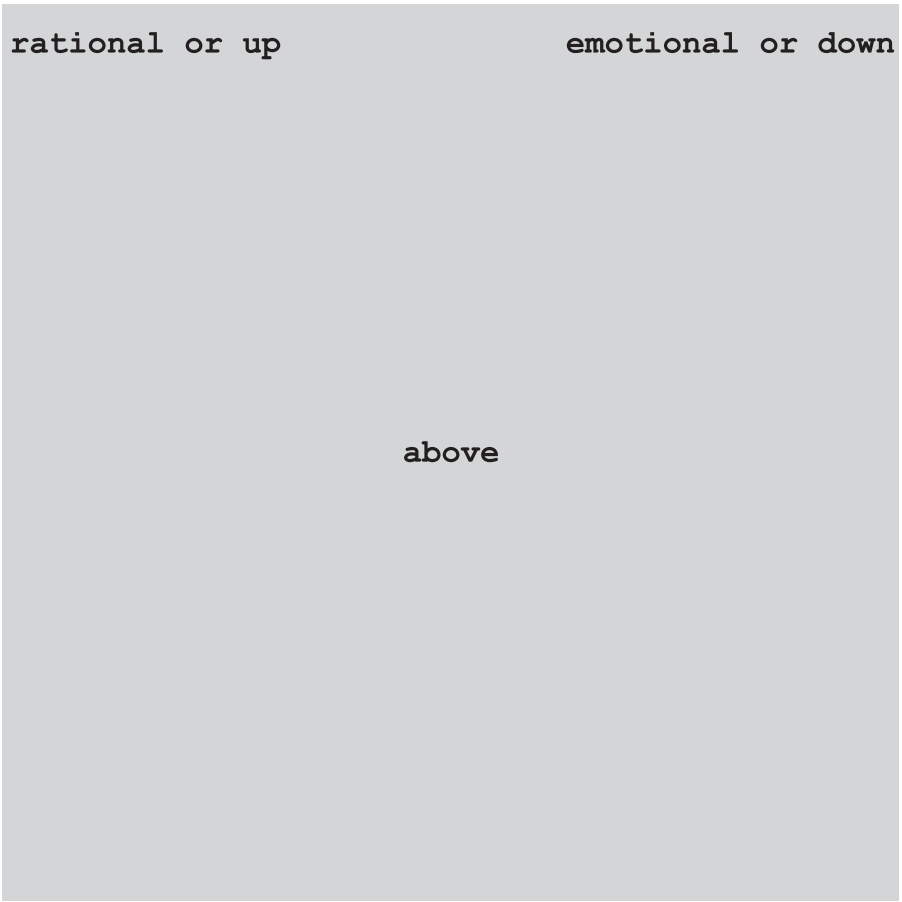
We counterbalanced the order of the two main blocks and their corresponding practice blocks between subjects (Brunel, Tietje, and Greenwald 2004), such that we assigned half the respondents to the described sequence (1-2-3-4-5-6-7) and the other half to a 1-5-6-7-2-3-4 sequence. Furthermore, the position of the categories along the horizontal dimension (left/right) was randomized between subjects.

Results and Discussion

We followed the data reduction procedure of Greenwald et al. (1998). The response times, measured in milliseconds, were log-transformed for the congruent and the

FIGURE 2

A SCREENSHOT OF STUDY 1 SHOWING AN EXAMPLE OF CATEGORY NAMES AND A TARGET WORD



incongruent blocks; response times for inaccurate, extremely fast (less than 300 milliseconds) and extremely slow (more than 300 milliseconds) responses were deleted (these limits are the standards generally implemented when analyzing data from an IAT; Greenwald et al. 1998; Meier et al. 2007). Analyses were performed on these transformed response times, but the means are reported in raw milliseconds to facilitate understanding of the response times.

We conducted a mixed-model ANOVA, with the congruent versus incongruent block as a within-subjects factor ("IAT block") and the counterbalanced order of the blocks as a between-subject factor ("IAT order"). Transformed response times were the dependent variable.

As hypothesized, the main effect of IAT block was significant ($F(1, 102) = 8.48$, $p < .01$). Subjects were quicker at categorizing words in the congruent condition, where rational-related words were paired with up-related words and emotional-related words were paired with down-related words ($M = 827.90$ milliseconds, standard deviation [SD] = 252.29 milliseconds); than in the incongruent condition, where these pairings were reversed ($M = 891.95$ milliseconds, SD = 272.57 milliseconds). The main effect of the IAT order and its interaction with IAT block were not significant (p's $> .17$).

Study 1 thus supports our primary hypothesis (hypothesis 1), indicating an implicit association of rational with up and emotional with down.

STUDY 2: CHINESE CHARACTERS' INTERPRETATION AS A FUNCTION OF VERTICALITY

Overview

Building on the association documented in study 1, study 2 tests whether this association affects how people categorize an ambiguous stimulus. We manipulated the vertical position of five Chinese characters on a computer screen (see figure 3), asking respondents if each character was more likely to be a Chinese brand logo for a statistical

FIGURE 3

CHINESE CHARACTERS USED IN STUDY 2

website (a target with rational connotations) or a dating website (a target with emotional connotations). A pretest with 40 undergraduates from a large university in the midwestern United States showed that a statistical website was considered more rational ($M = 7.38$) than a dating website ($M = 3.05$, $F(1, 38) = 136.83$, $p < .01$), whereas a dating website was considered more emotional ($M = 7.53$) than a statistical website ($M = 1.71$; $F(1, 38) = 272.30$, $p < .01$; 9 point scales anchored at Not at all rational/emotional and Extremely rational/emotional).

Per hypothesis 1, when a Chinese character is shown in a higher (versus lower) part of the screen, people should be more likely to interpret it as a logo for a statistical (versus dating) website; conversely, when it is on a lower (versus higher) part of the screen, it should more likely be interpreted as a logo for a dating (versus statistical) website.

Method

Thirty undergraduates from a large university in the midwestern United States completed the study in exchange for course credit. Only participants who did not have any knowledge about the Chinese language were included in the study.

As a cover story, participants were told that this experiment investigates judgments of novel images. They were informed that they would see an image of a Mandarin Chinese character in different locations on the screen; their task was to decide whether the Chinese character fits better as a logo for a statistical website or a dating website. We told them that the location of the image would vary from character to character to increase participants' attention and interest.

The images were presented on a 14-inch computer screen with a white background. Each subject was asked to evaluate five Chinese characters, one by one, in a random order ("order"). Before each character appeared on the screen, subjects saw a "fixation clue (+)" in the middle of the screen for 1000 milliseconds. This was done to center fixation, and thereby ensured that every character had the same centered attentional focus. We programmed the task such that each participant randomly saw each image in one of two positions on the screen. These positions were equidistant from the middle in verticality but either at the far top or far bottom of the computer screen—we call these the higher and lower position ("position"). Each image was shown for 1000 milliseconds.

TABLE 1

RESPONDENTS' CATEGORIZATION (STATISTICAL VS. DATING) OF THE FIVE CHINESE CHARACTERS SHOWN IN STUDY 2

		Position		
		Lower	Higher	Total
Response	Chinese statistical website	30 39%	44 60%	74
	Chinese dating website	47 61%	29 40%	76
	Total	77	73	150

After seeing each image, subjects indicated as quickly as possible (by pressing the p or the q key on the keyboard) whether the image was more likely to be a brand logo for a Chinese statistical website or a Chinese dating website. Whether p or q was used for indicating the "statistical" or the "dating" websites was counterbalanced ("key").

"Order" and "key" were not significant in any analysis (p's $> .4$) and are not discussed further.

Results and Discussion

A contingency table with the count of responses (30 subjects × 5 Chinese characters) is shown in table 1.

As predicted, a high spatial placement increased the likelihood that an image was categorized as the brand logo of a Chinese statistics website, whereas a low spatial placement increased the likelihood that it was categorized as the brand logo of a Chinese dating website. To analyze the data, we used a generalized estimating equation model—a generalized form of logistic regression for choices observed under a within-subjects design (Ge, Häubl, and Elrod 2012; Liang and Zeger 1986)—with "position" (higher/lower) and the specific "image" as independent variables and choice (statistical/dating website) as the dependent variable. Vertical position was indeed a significant predictor of subjects' choices (B = −870, Wald 5.49, 1 *df*, $p < .05$), whereas the image used was not significant (Wald 3.99, 4 *df*, $p > .4$).

These results support hypothesis 1 that vertical position affects perceivers' interpretation of ambiguous stimuli in ways that reflect the metaphorical connection of up with rationality and down with emotion identified in study 1.

Ruling Out Valence as an Explanation. Note that these results are difficult to account for on the basis of a verticality-valence association identified in other work (Meier and Robinson 2004). For undergraduate marketing students, dating websites have a more positive valence than statistics websites (a truism we confirmed in a pretest;

$M_{dating} = 6.21$, $M_{statistics} = 3.23$; $F(1, 51) = 44.23$, $p < .01$; 9 point scales anchored at Bad/dislike/unpleasant and Good/like/pleasant; $\alpha = .94$). Hence the verticality-valence association would predict that a given ideograph is more likely to be identified as a dating website (positive valence) when shown in a high position, and as a statistics website (negative valence) when shown in a low position. This pattern is the opposite of what we observed.

STUDY 3: WHERE DOES THE MUSIC SECTION VERSUS THE SCIENCE SECTION GO ON A WEBSITE?

Overview

Study 2 showed that the physical placement of a stimulus along the vertical dimension can influence its interpretation along the metaphorically related rational-emotional dimension. This influence follows the direction from concrete sensory perception (physical space) to abstract concepts, which is often assumed to be the primary direction of influence (Landau et al. 2010). In study 3, we tested whether the metaphorical association of verticality and rationality/emotionality can also exert an influence in the opposite direction (i.e., if the rational vs. emotional connotations of a stimulus affect its spatial placement). To test this, we asked people to freely place two sections of a website onto an empty page.

Pretests

Pretest 1. We asked 62 people from an online subject pool to rank various sections of an online newspaper on rationality and emotionality. We chose the business, culture, news, science, technology, art, entertainment, food, music, and style sections for this purpose, assuming that the first five would be more representative of rationality and the latter five with emotionality. Music was ranked as the most emotional ($M = 7.56$) and science as the most rational ($M = 1.97$) on 9 point scales anchored at 1 (Extremely rational) and 9 (Extremely emotional).

Pretest 2. We assessed whether the music section and the science section differed on dimensions other than rationality/emotionality. Specifically, we wanted to ensure that the two sections did not vary on valence, importance, and prototypicality. Fifty-one participants from an online pool participated in this second pretest. Participants were told that they would be rating a website newspaper section on several dimensions. Each participant was randomly assigned to view one of two sections, presented in the center of a computer screen. To measure valence, participants were asked to rate their attitudes toward the section (1 = Bad/dislike/unpleasant; 9 = Good/like/pleasant; $\alpha = .97$; Mitchell and Olson 1981). Then we asked subjects how important they thought the section was (1 = Not important at all; 9 = Extremely important). Finally, to test prototypicality and other possible conscious associations with verticality, we asked respondents if they would expect the section to be in a high or low position (1 = Low; 5 = Neither high nor low; 9 = High); if they would associate the section with something that goes up or down (1 = Goes down; 5 = Goes neither up nor down; 9 = Goes up); and if they would associate the section with something that is up or down in position (1 = Up; 5 = Neither up nor down; 9 = Down, $\alpha = .72$). There was no significant difference between the two sections (all p's $> .4$) in all the dimensions considered.

Main Study

Study 3 had two between-subjects conditions (section: science vs. music). Forty-seven people from an online pool participated in this study. First, participants were told that we wanted to create a new website and needed to decide where to place different sections. We instructed participants that they were going to see two pages. On the first page, they were going to see the name of the specific section they had to place. On the second page, they were going to see a blank square. Participants were invited to think of the blank square as an empty website and use the computer mouse to click a position where they would place the section. After these instructions, each participant was randomly assigned to view one of two web sections: science or music. The name of the section was presented in the middle of a white page. Finally, we showed the participants a blank square of 500×500 pixels.

We programmed the survey such that when participants clicked with their mouse, the website section (music or science) that they had previously viewed appeared on the screen. They were allowed to click as many times as they wished until they were satisfied with their placement of the section. The placement of the section, as measured in pixel coordinates, represented our dependent variable of interest.

To ensure that participants were able to see the blank square, we showed them a 500×500-pixel blue square at the very beginning of the questionnaire and asked them if they were able to see the square without scrolling. Participants who had to scroll were automatically directed to the end of the questionnaire and then paid. Finally, we programmed the survey to automatically detect the participant screen resolution to make sure it was not a confounding factor.

Consistent with hypothesis 1, we predicted that subjects would place the science section higher along the vertical axis than the music section.

Results and Discussion

An ANOVA with section (science or music) as the independent variable and pixel coordinates along the vertical axis as the dependent variable revealed that the science

section was placed significantly higher along the vertical axis than the music section ($M_{science} = 401.68$ pixels, $M_{music} = 332.14$ pixels; $F(1, 45) = 5.32$, $p < .05$). Section (science or music) was not a significant predictor of pixel coordinates on the horizontal-axis ($M_{science} = 204.40$ pixels, $M_{music} = 222.05$ pixels; $F(1, 45) = .21$, $p > .6$).

Study 3 reveals that the relationship between verticality and rationality/emotionality is bidirectional: much as spatial placement can affect the interpretation of stimuli (study 2), the connotations of stimuli can affect their spatial placement (study 3). Furthermore, this study reveals that people not only hold the metaphorical association in their mind, but they tend to recreate it when they are free to manipulate rational and emotional stimuli along the vertical dimension.

Note that participants placed the science section higher than the music section even though pretest 2 for this study found no conscious expectations for this placement. This is consistent with the observation that people are often not aware of the conceptual metaphors that structure their thoughts (Lakoff and Johnson 1999). In fact, being aware of the metaphorical association at the time of judgment may undermine its influence (hypothesis 3). We test this prediction directly in study 4.

STUDY 4: AWARENESS OF THE METAPHORICAL ASSOCIATION

Overview and Method

Study 4 had a 2 (vertical awareness: no, yes) × 2 (website section: rational, emotional) between-subjects design and used 138 people from an online pool. Study 4 replicated study 3 but added "awareness" conditions. The design for the conditions in which we did not elicit the association awareness was the same as in study 3. In the conditions where subjects were made aware of the metaphorical association, there was a small variation in the instructions. Adapting the awareness procedure from Schwarz and Clore (1983), at the end of the instructions, we added the following sentence: "We are interested in studying if a website section that is more related to rational or emotional contents affects the vertical position in which you will place it."

Results and Discussion

We conducted a 2 × 2 ANOVA with awareness and website section as the independent variables and pixel coordinates along the vertical axis as the dependent variable. Neither the main effect of awareness nor the main effect of the website section was significant ($p > .1$). However, the interaction between the two factors was significant ($F(1, 134) = 4.13$, $p < .05$). Planned contrasts revealed that within the unaware condition, participants placed the science section above the music section ($M_{science} = 390.36$ pixels, $M_{music} = 335.74$; $F(1, 134) = 6.89$, $p < .05$), replicating the results of study 3. However, within the aware condition, no significant difference emerged between the two sections ($M_{science} = 356.40$ pixels, $M_{music} = 362.02$; $p > .7$). Finally, we found no difference between all four conditions regarding the section position along the horizontal axis (all p's $> .7$)

We also captured the time participants spent until their last click on the blank square. Here the aware and unaware conditions differed, with participants in the aware condition spending more time before making their final click compared to participants in the unaware condition ($M_{unaware} = 7.21$ seconds, $M_{aware} = 10.53$ seconds; $F(1, 136) = 5.64$, $p < .05$). This difference in the time spent provides some indirect support for automaticity because a longer time (vs. shorter time) spent in a choice setting is usually an indicator of a more controlled (vs. automatic) process (Dhar and Nowlis 1999; Suri and Monroe 2003). Making subjects aware of the metaphorical association seems to motivate them to think more about the vertical position in which the section is located. However, in the unaware conditions, participants seem to have used automatic and subconscious processing, which is both less effortful and quicker than systematic processing (Chaiken 1980; Eagly and Chaiken 1993).

Study 4 corroborates the results of study 3, showing how the rational/emotional connotations of stimuli can affect their spatial placement. However, supporting hypothesis 3, we found that conceptual metaphors are less influential when attention is drawn to them. Note that the "awareness" manipulation of this study only made participants aware that the researchers were studying whether emotional versus rational content affected vertical placement, without providing information about what the expected effect might be. This renders the test in study 4 fairly conservative.

STUDY 5: EFFECT OF VERTICALITY ON EVALUATION OF A POLITICAL SLOGAN

Overview

We have proposed that a match between physical verticality (higher/lower position) of a stimulus and its characteristics (rational/emotional associations) should lead to more positive evaluations of the stimulus (hypothesis 2). Study 5 tests this prediction. Participants were exposed to a rational or emotional political slogan presented high or low on a computer screen. Of central interest is whether a slogan is evaluated more favorably when its vertical placement is consistent with its rational versus emotional connotation.

Pretest

We created two political slogans for a nonpartisan election that differed in only one word. One had more of a rational appeal and the other more of an emotional appeal.

Rational appeal: "Intelligence in serving the community"
Emotional appeal: "Passion in serving the community"

We pretested these descriptions with an online panel ($n = 47$) to ensure that they conveyed the desired appeal. Each participant was shown one description (presented in the center of a computer screen) and then asked to rate the rational/emotional appeal and political claim valence. We measured rational/emotional appeal with two items, namely, "Does this slogan have a rational or an emotional appeal?" (1 = Rational; 5 = Neither rational nor emotional; 9 = Emotional), and "Does this slogan evoke more feelings or thoughts?" (1 = Thoughts; 5 = Neither thoughts nor feelings; 9 = Feelings; $\alpha = .95$). These items were adapted from Shiv and Fedorikhin (1999). To measure valence, participants were asked to rate their attitudes toward the claim (1 = Bad/dislike/unpleasant; 9 = Good/like/pleasant; $\alpha = .96$; Mitchell and Olson 1981).

As expected, the rational slogan was rated as having a more rational appeal ($M = 3.37$), whereas the emotional slogan was rated as having a more emotional appeal ($M = 7.21$; F (1, 45) = 57.66, $p < .01$), both significantly different from the neutral point of 5 (p's $< .01$). In terms of valence, both the slogans were rated close to the neutral point of the scale, with the emotional slogan having a (marginally significant) higher positive valence than the rational logo ($M_{rational} = 5.52$, $M_{emotional} = 6.57$; $F(1, 45) = 3.33$, $p = .07$).

Main Study

Study 5 had a 2 (appeal: emotional, rational) × 2 (screen position: higher, lower) between-subjects design. A total of 122 undergraduates from a large university in the midwestern United States completed the study in exchange for course credit. Each participant was told that he or she would be evaluating a political slogan for a nonpartisan political election (that is, we specified that the candidate had no affiliation with a political party). They were then randomly assigned to one of the four conditions (i.e., rational slogan in the higher part of the screen, rational slogan in the lower part of the screen, emotional slogan in the higher part of the screen, and emotional slogan in the lower part of the screen). As in study 2, the higher and lower positions of the screen were equidistant from the middle. Participants were then asked for their attitudes toward the slogan (1 = Bad/dislike/unpleasant; 9 = Good/like/pleasant; $\alpha = .96$; Mitchell and Olson 1981), the slogan relevance ("This slogan was meaningful to me," "This slogan is relevant to me," and "This slogan is important to me" anchored on 1 = Not at all to 9 = Very much; $\alpha = .96$; Williams and Drolet 2005), and their intention to vote for the candidate (on a scale from 1 to 100).

Results and Discussion

Table 2 shows the raw means of each dependent variable.

Attitude toward the slogan, slogan relevance, and intention to vote were all highly correlated ($\alpha = .74$ on the z-scores). Accordingly, we created an overall "slogan preference index" (which ranged from − 1.80 to 1.92). We then conducted a 2 × 2 ANOVA with position and appeal as the independent variables, and slogan preference index as the dependent variable.

The main effect of rational/emotional appeal was in the same direction of the pretest ($M_{rational} = -.13$, $M_{emotional} = .13$), although it was not statistically significant ($p > .1$). The main effect of position was not significant ($p > .8$). However, as expected, the interaction between appeal and position was significant (F (1, 118) = 9.39, $p < .01$). Planned contrasts reveal that the rational slogan was evaluated more favorably when it was presented higher versus lower on the screen ($M_{higher} = .10$, $M_{lower} = -.33$; F (1, 118) = 4.13, $p < .05$). Conversely, the emotional slogan was evaluated more favorably when presented at a low versus high position on the screen ($M_{higher} = -.13$, $M_{lower} = .36$; F (1, 118) = 5.30, $p < .05$; results of the individual measures are included in the online appendix).

Study 5 supports our hypothesis 2 that a match between physical verticality (higher/lower position) of a stimulus and its metaphorically associated characteristics (rational/emotional connotation) results in more positive stimulus evaluations. Thus the association between verticality and rationality/emotion has downstream consequences, influencing people's preferences.

Note also that the obtained pattern is incompatible with an alternative pathway through the metaphorical association of verticality and valence (Meier and Robinson 2004). The verticality-valence metaphor predicts a main effect of

TABLE 2

STUDY 5 RAW MEANS

Slogan	Position	Attitude toward the slogan	Slogan relevance	Intention to vote	Slogan preference index
Rational	Higher	5.10	4.76	50.14	.10
	Lower	4.39	3.77	43.55	−.33
Emotional	Higher	5.11	3.85	46.28	−.13
	Lower	6.13	4.80	53.09	.36

position (up is good), rather than the observed interaction between position and type of appeal.

STUDY 6: HEALTHY, TASTY FOOD AND THE MODERATING EFFECT OF FAMILIARITY

Overview

We have proposed that familiarity with the brand will moderate the effect of the match of physical verticality with the rational/emotional nature of stimuli on preferences for the stimuli. A familiar brand triggers brand associations that exist within a consumer's knowledge set. Thus with greater familiarity, prior knowledge and evaluation may attenuate the effect of the metaphorical match on product evaluation (hypothesis 4).

In study 6, we provide product ads with brand names that are either familiar or not familiar, and we explore the impact of metaphorical match/mismatch on evaluations of the product. We ran two pretests to assess the rational/emotional connotation of the headlines and to choose the brands. We first present the pretests and explain the stimuli, and then continue with the main experiment.

Pretests and Stimuli

We created two headlines for an ad depicting a granola bar. The headlines differed only in one word and had a different (rational/ emotional) appeal.

Rational appeal: "The healthy choice"
Emotional appeal: "The tasty choice"

Pretest 1. Sixty participants from an online pool evaluated the headlines. Using the same rationality/emotionality scale as used in study 5 ($\alpha = .96$), participants evaluated the tasty headline as having a more emotional appeal ($M = 2.53$), whereas they evaluated the healthy headline as having a more rational appeal ($M = 6.95$; both significantly different from the midpoint 5, p's $< .01$). In terms of valence ($\alpha = .91$), we found no significant difference between the two headlines ($M_{\text{healthy}} = 6.24$, $M_{\text{tasty}} = 6.38$; $p > .7$).

Pretest 2. We asked 20 people from an online pool to list, in a free response format, three brands of granola bars familiar to them. Kashi, Nature Valley, and Quaker were most frequently listed. We chose Kashi as the familiar brand. Building on these pretests, we created eight versions of an ad for a granola bar, with the product centered in the middle (Figure 4). In four of these ads, we used Kashi as the familiar brand; in the other four, we created a fictitious brand called "Dori"—this was used as the unfamiliar brand. Both for Kashi and Dori, two of the ads had the rational headline (either above or below the product), and the other two ads had the emotional headline (either above or below the product). As in the previous studies, the higher and lower positions were equidistant from the middle.

Main Study

Design. Study 6 had a 2 (brand: familiar, unfamiliar) × 2 (appeal: emotional, rational) × 2 (position: higher, lower) between-subjects design. Each subject was randomly assigned to one of the eight conditions. Our dependent variables were the same as in study 4 (i.e., attitudes, relevance, and behavioral intention). Since we used food as stimuli, we also controlled for respondents' gender and level of hunger (Brunstrom et al. 2008; Lozano, Crites, and Aikman 1999; Wardle et al. 2004).

Procedure and Measures. We ran study 6 using an online pool. Because brand familiarity was a critical factor in our study, we asked in the survey description that only people who were familiar with the Kashi brand (and unfamiliar with the Dori brand) take the survey. After reading the description, 360 participants started the questionnaire in exchange for money. To further screen for familiarity, we first asked participants to evaluate their familiarity with the "Dori"/"Kashi" brand name on a 7 point scale (7 = Very familiar, 6 = Quite familiar, 5 = Slightly familiar, 4 = Neither unfamiliar nor familiar, 3 = Slightly unfamiliar, 2 = Quite unfamiliar, 1 = Very unfamiliar; Berlyne and Parham 1968). Participants who were "quite familiar" or "very familiar" with Kashi and also "quite unfamiliar" or "very unfamiliar" with Dori were allowed to continue with the survey, whereas the others (14 participants [4% of the total]) were automatically directed to the end of the questionnaire and paid without being asked any further questions. Thus 346 respondents passed our screening questions and completed the main survey.

After this screening, participants completed an unrelated five minute filler task and then reported their hunger (on a scale from 1 = Very full to 9 = Very hungry). Finally, they were directed to the main study. Here, participants were told that they would be evaluating an ad for a granola bar and were randomly assigned to one of the eight conditions. Similar to study 4, after viewing the ad, we asked participants for their attitudes toward the granola bar, the headline relevance, and their behavioral intentions. The attitude and relevance scales were adapted from study 5 (attitude scale $\alpha = .97$; relevance scale $\alpha = .94$). With respect to the behavioral intentions, similarly to study 5, we asked them to evaluate their intention to eat and to buy the granola bar (both on a scale from 1 to 100; $\alpha = .89$).

Results and Discussion. Table 3 shows the raw means of each dependent variable.. Attitude toward the product, slogan relevance, intention to eat, and intention to buy were all highly correlated ($\alpha = .90$ on the z-scores). Consequently, we created an overall "preference index" (ranging from −1.99 to 1.62). We then conducted a

FIGURE 4

ADS USED IN STUDY 6

Familiar Brand, Rational Headline, Higher Position

Familiar Brand, Rational Headline, Lower Position

Familiar Brand, Emotional Headline, Higher Position

Familiar Brand, Emotional Headline, Lower Position

Unfamiliar Brand, Rational Headline, Higher Position

Unfamiliar Brand, Rational Headline, Lower Position

Unfamiliar Brand, Emotional Headline, Higher Position

Unfamiliar Brand, Emotional Headline, Lower Position

TABLE 3

STUDY 6 RAW MEANS

Unfamiliar brand	Headline	Position	Attitude toward the product	Headline relevance	Intention to eat	Intention to buy	Overall preference index
Dori	*Rational*	Higher	6.46	4.16	61.40	52.71	.00
		Lower	5.34	3.38	44.23	37.25	−.51
	Emotional	Higher	6.03	3.27	50.00	40.61	−.36
		Lower	7.13	4.04	63.39	57.09	.11
Familiar brand	Headline	Position	Attitude toward the product	Headline relevance	Intention to eat	Intention to buy	Overall preference index
Kashi	*Rational*	Higher	7.45	4.66	65.21	63.17	.30
		Lower	7.02	4.43	64.45	60.95	.19
	Emotional	Higher	6.81	3.95	66.51	55.56	.08
		Lower	6.98	4.45	68.72	59.47	.21

$2 \times 2 \times 2$ analysis of covariance with brand familiarity, rational/emotional appeal, and position as the independent variables; preference index was the dependent variable, and hunger and gender were covariates.

The main effect of brand familiarity was significant (F (1, 336) = 16.62, $p < .01$), with the familiar brand preferred to the unfamiliar one. The main effect of rational/emotional appeal and position were not significant (p's > .8). Hunger had a significant effect on the preference index (F (1, 336) = 4.91, $p < .05$), supporting previous literature showing that hunger enhances attitudes toward the food and purchase intentions (Lozano et al. 1999). Gender was marginally significant ($p = .08$), with females having higher preference for the granola ad than males, both in the familiar and unfamiliar condition.

None of the two-way interactions were significant ($p > .1$), except for the interaction between rational/emotional appeal and position (F (1, 336) = 10.53, $p < .01$). However, this is qualified by a significant three-way interaction between familiarity, rational/emotional appeal, and position (F (1, 336) = 4.24, $p < .05$). Planned contrasts reveal that—within the unfamiliar brand—participants evaluated the ad with the rational headline more favorably when the rational headline was presented above rather than below the granola bar (F(1, 336) = 6.87, $p < .01$). Conversely, participants evaluated the ad with the emotional headline more favorably when the emotional slogan was presented below rather than over the granola bar (F (1, 336) = 7.29, $p < .01$). Within the familiar brand, however, neither planned contrast was significant ($p > .4$). Results of the individual measures are included in the online appendix.

Study 6 further corroborates hypothesis 2 and provides support for hypothesis 4. Results shows that a match between physical verticality (higher/lower position) of a stimulus and its metaphorically associated characteristics (rational/emotional connotation) results in more positive evaluations (hypothesis 2), unless the brand is familiar (hypothesis 4). A further contribution of study 6 is that it uses stimuli that resemble real ads, which gives our research more external validity and generalizability to the kinds of ads used in the market.

GENERAL DISCUSSION

This series of six main studies (and a pilot) shows a robust association between the abstract concepts of rationality and emotions and the physical dimension of verticality. First, we demonstrate an implicit association between verticality and rationality/emotion using an IAT procedure (study 1). Second, we find this metaphorical association to be bidirectional, going from concrete to abstract (study 2) as well as from abstract to concrete (study 3). Specifically, ambiguous stimuli are perceived as having a more rational meaning when presented high rather than low on a screen (study 2). Conversely, stimuli with rational connotations are placed higher on the screen than stimuli with emotional connotations (study 3). We show how this association has downstream effects, affecting people's preferences: a given stimulus is evaluated more favorably when its spatial placement matches its rational/emotional connotations (studies 5 and 6). Moreover, we explore two boundary conditions. In study 4, we show how the metaphorical effect fades when people become aware of the association. In study 6, we also show that familiarity with the brand attenuates the effect of the metaphorical match (mismatch) on perceivers' preferences toward the stimuli.

Theoretically, our work contributes to the conceptual metaphor and embodied cognition literature (Barsalou 2008, Krishna and Schwarz 2014; Lakoff and Johnson 1980, 1999; Landau et al. 2010; Lee and Schwarz 2014a) by showing a metaphorical association between verticality and rationality/emotionality—that rationality is associated with up or higher and emotion with down or lower. This research also contributes to the literature exploring the impact of visual cues on consumer behavior (Greenleaf and Raghubir 2008; Hoegg and Alba 2011; Hoegg, Alba, and

Dahl 2010; Patrick and Peracchio 2010; Vadiveloo, Morwitz, and Chandon 2013) by demonstrating how visual positioning of information along the vertical dimension can affect consumer attitudes, preferences, and interpretation of ambiguous information.

Theoretical Implications

Verticality has been associated with several conceptual metaphors, such as valence (good is up; Meier and Robinson 2004), power (powerful is up; Schubert 2005), and morality (moral is up; Meier et al. 2007). Our studies add rationality (rational is up) to this list. Methodologically, this requires that competing metaphorical meanings of identical sensory inputs are controlled for, as we have done in the present studies. More important, it raises the conceptual issue of what determines which of the multiple metaphorical meanings of a given sensory attribute a perceiver adopts. We assume that the answer parallels findings in other domains: perceivers adopt the interpretation that is rendered most accessible by the task and the context in which it is presented. This issue has been extensively explored in the domain of fluency research, where the same metacognitive experience (i.e., the subjective experience of ease or difficulty with which people process information) can inform a wide variety of judgments, taking on different meanings in different contexts (Alter and Oppenheimer 2009; Schwarz 2004, 2010, 2015). For example, fluently processed stimuli are judged as more positive (Winkielman and Cacioppo 2001), less risky and more familiar (Song and Schwarz, 2009), more beautiful (Reber et al. 2004), more likely to be true (Reber and Schwarz 1999), and so on (Schwarz 2010). This malleability reflects that people's inferences from experienced fluency are guided by lay theories of mental processes that are themselves recruited by the context and the task they face (Schwarz 2004, 2010). Moreover, once an accessible interpretation has been adopted, competing interpretations are less accessible and people arrive at judgments that are at odds with inferences they would have readily drawn from the same input in a slightly different context (Schwarz 2010). Similarly, the rational versus emotional connotations of the stimuli (e.g., science vs. music websites in study 3 or rational vs. emotional political slogans in study 5) or tasks (e.g., determining the brand logo of a statistics vs. dating website in study 2) elicited an interpretation of verticality information along the rational-emotional dimension, which was brought to mind by the tasks themselves. Once this interpretation was adopted, perceivers no longer seemed to use other metaphorical associations that reflect a link of verticality and valence (Meier and Robinson 2004) or verticality and power (Schubert 2005). Exploring the context sensitivity of metaphor selection and application is a promising (and pressing) issue for future research (Krishna and Schwarz 2014).

A second issue of broad theoretical importance is the directionality of metaphor effects. Studies 2 and 3 showed that the association between physical verticality and rationality/emotionality is bidirectional. In contrast, Meier and Robinson (2004) found that the association between physical verticality and affective valence is unidirectional. For example, perceivers' affective states influence visual perceptions but not vice versa. A consensus on the directionality of conceptual metaphor effects has not been reached, although plentiful research exists on the subject (cf. Landau et al. 2010; Lee and Schwarz 2012; Zhang and Wang 2009; Zhong and Leonardelli 2008). Zhang and Li (2012) proposed that conceptual metaphors exert a unidirectional effect when the target domain is abstract and has no direct bodily connotations; conversely, they expect bidirectional effects when the target domain has bodily connotations. The fit of this account depends on what one considers "bodily." On the one hand, the observed bidirectional association of verticality with rational/emotional fits the account, given that the association is rich in direct and clear body states (e.g., heart rate increase and headaches, as previously discussed). On the other hand, Meier and Robinson's (2004) unidirectional association of verticality and affective valence is only compatible with the account if we assume that the valence stimuli they used have fewer bodily associations than the material used in the present studies. Suffice it to say that the determinants of metaphorical directionality remain a challenging issue that requires more extensive experimentation.

Finally, it is also worth noting that awareness of a potential influence of the metaphorical link attenuated its impact in study 4. This is consistent with extensive research showing that awareness of potential contextual influences—from feelings (Schwarz and Clore 1983) to accessible concepts (Strack et al. 1993)—undermines their impact (for a review, see Schwarz 2012). This also suggests that metaphors exert more influence when their introduction is subtle rather than blatant, which deserves more attention in future research.

Managerial Implications

Several directly implementable managerial implications are also worth nothing. First, the present studies used brands, website sections, food ads, and political slogans as stimuli. However, the lessons learned should apply to many other elements of marketing communications. Indeed, all visual formats—whether a printed page or a television, computer, or smartphone screen—integrate vertical placement. Our studies suggest that when deciding on the vertical positioning of products or information on a printed page or a computer screen, marketing managers should take into consideration the rational-emotional association of their message. The information will be much more powerful when the vertical position matches rather

FIGURE 5

OBAMA HOPE POSTER

Source: This image was originally posted to Flickr by "Count to 10" at https://www.flickr.com/photos/31057088@N02/8083830049. It is licensed under the terms of the Creative Commons v.2.0.

than mismatches the rational versus emotional content of the message. One must acknowledge, however, that verticality may at times have less of an effect on the interpretation of the stimulus and thus on the consequent attitudes, such as when an individual is familiar with a brand and has preconceived opinions about it, as in study 6. In study 5, a political slogan with a rational (emotional) appeal was more influential when the appeal was presented in the higher (lower) part of the ad, resulting in differential voting intentions. As a real-world illustration, we end by noting how Shepard Fairey's (Figure 5) iconic HOPE poster for the 2008 Obama campaign observed the metaphor matching principle, placing HOPE with its strong emotional associations in the lower part of the image. This metaphorical match may not have influenced people with strong prior opinions about Obama. However, for the many undecided and less opinionated voters, the emotional slogan on the lower part of the poster may have led to a more positive attitude toward Obama than if the same slogan had been in the upper part.

DATA COLLECTION INFORMATION

The first author supervised the collection of data for all the studies by research assistants. The data were collected from summer 2012 to spring 2015 either at the Behavioral Lab of the Ross School of Business (University of Michigan) or using the Amazon Mechanical Turk panel (details are described in the methods section of the studies). The first author analyzed the data collected in all studies. All the authors continually discussed data analyses and results. Data results were also discussed in multiple occasions in Professor Krishna's Sensory Marketing Lab and in Professor Schwarz's Social Cognition Lab.

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