

LEIF D. NELSON and JOSEPH P. SIMMONS\*

Consumers are influenced by the metaphoric relationship between cardinal direction and vertical position (i.e., “north is up”). People believe that it will take longer to travel north than south (Study 1), that it will cost more to ship to a northern than to a southern location (Studies 2 and 6), and that a moving company will charge more (Studies 3a and 3b) for northward than for southward movement. Furthermore, people have greater intention to visit stores advertised to be south (versus north) of a reference point (Study 4), especially when ease of travel is important (Study 5).

*Keywords:* time perception, price perceptions, embodied cognition, perceptual symbols, intuition

## On Southbound Ease and Northbound Fees: Literal Consequences of the Metaphoric Link Between Vertical Position and Cardinal Direction

Well it's all up from Florida,... and it's roll back down to St. Petersburg.

—Bob Dylan, “Dusty Old Fairgrounds” lyrics

I always like going south. Somehow ... it feels like going downhill.

—Treebeard, *Lord of the Rings: The Two Towers*

Forecasts of travel time, travel ease, and travel costs influence consumer decision making, including the choice of travel routes and destinations (Bell, Ho, and Tang 1998). In his review of consumer travel behavior, Hubbard (1978) discusses the economic assumption that people try to minimize travel, but research indicates that consumers' actual behavior often diverges from that standard. For example,

research shows that consumers prefer a route that continuously progresses toward a final goal, even if it takes longer than an alternative route (Soman and Shi 2003). Furthermore, when shown a map featuring several stops on a possible shopping trip, consumers minimize the distance between stores even when it means traveling farther from home and lengthening the total trip distance (Brooks, Kaufmann, and Lichtenstein 2004).

Even when accurate maps are provided, people are biased in their estimations of time and distance. Consumers frequently underestimate travel distances in part because they encode travel times instead (Kang, Herr, and Page 2003). In addition, people may underestimate travel distances because they rely on heuristics that overemphasize direct distance (Raghubir and Krishna 1996). For example, in one study, consumers were shown a line map and asked to estimate the path distance between two points. When participants counted out loud during this task, they made fewer adjustments from the direct line distance estimation and judged the overall travel distance to be shorter than participants who were not counting out loud. Indeed, many studies show that consumers use a variety of psychological mechanisms to assess time and distance and that these mechanisms often lead to counternormative assessments.

This article extends these findings by identifying an independent and, thus far, undocumented influence on consumers' travel-related judgments. Specifically, we show that

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\*Leif D. Nelson is Assistant Professor of Marketing, Haas School of Business, University of California, Berkeley (e-mail: leif\_nelson@haas.berkeley.edu). Joseph P. Simmons is Assistant Professor of Marketing, Yale School of Management, Yale University (e-mail: joseph.simmons@yale.edu). The authors contributed equally to this work, and author order was determined by geographical latitude. The authors thank Jeff Galak for his assistance in collecting and analyzing the data for the preliminary study and Geoff Goodwin and Tom Meyvis for their comments on a previous version of the article. They also thank Gloria Simmons for her role in motivating this research. Portions of this research were presented at the 2007 meeting of the Association for Consumer Research in Memphis and at the 2008 meeting of the Society for Experimental Social Psychology in Sacramento. Dilip Soman served as associate editor for this article.

the metaphors people use to describe spatial relations can affect their judgments of travel time, ease, and costs.

#### *CARDINAL DIRECTION AND VERTICAL POSITION*

Consider the quotations that open this article. Whether making reference to living “up north” or “down south,” people often use the language of vertical position to describe cardinal direction. As Bob Dylan’s lyrics suggest, moving north is often described as moving up, and moving south is often described as moving down. The second quotation, spoken by a character in *Lord of the Rings: The Two Towers*, contains the same sentiment while implying that traveling south actually *feels* like going downhill.

Travelers heading south are no more likely to be going downhill than those traveling north. Nevertheless, we suggest that a lifetime of exposure to the metaphoric link between cardinal direction and vertical position may cause people to associate northbound travel with uphill travel and southbound travel with downhill travel. As a result, consumers may expect northbound travel to be longer, costlier, and more difficult than southbound travel.

On the surface, this hypothesis diverges from sensible intuition, but recent research (e.g., Barsalou 1999; Zhong and Liljenquist 2006) suggests that people often behave as though metaphor-based associations are literal. Subsequently, we briefly review theory and research consistent with this notion, identify the few ways that this research has already influenced understanding of consumer behavior, and describe how it can be used to make predictions about consumer judgment.

#### *THE EFFECT OF METAPHORS ON PERCEPTION AND JUDGMENT*

Metaphor usage can change perceptions, causing people to treat figurative language as if it were literal. This thesis derives in large part from the theory of perceptual symbol systems (PSS; Barsalou 1999), which suggests that knowledge is represented as perceptual symbols rather than as propositions or feature lists. According to PSS, knowledge is encoded, stored, and retrieved in terms of how it is perceived. As a result, perceptually associated concepts are encoded, stored, and retrieved as if they are in fact associated. Thus, because “north” is frequently above “south” on maps and in sentences (in both the northern and southern hemispheres), people’s memories may falsely indicate that north is physically above south. Importantly, these memories may guide people’s judgments and decisions about travel time, travel ease, and travel costs.

Impressive evidence supports PSS. For example, people are faster to identify the relationship between two words (e.g., “basement” and “attic”) when the word presentation is consistent with their spatial relationship (e.g., “attic” above “basement”; Zwaan and Yaxley 2003). Perceptual symbol systems theory also applies to abstract concepts. For example, people associate vertical position with power: When presented with pairs of occupations (e.g., professor and student), people are faster to identify related words when the high-powered role is physically above the low-powered role (Schubert 2005). Furthermore, people associate vertical position with valence. People are faster to identify positive words when they are presented on the top of a computer screen and faster to identify negative words when they are

presented on the bottom of the screen (Meier and Robinson 2004). Dozens of studies demonstrate that spatial cues influence perceptual symbols, which in turn can influence judgments of power, time, respect, and valence (for reviews, see Barsalou et al. 2003; Niedenthal et al. 2005).

Thus, metaphoric language and experience can determine the way people encode and retrieve knowledge; as a result, they may treat metaphors literally. In support of this, one set of studies finds that metaphors linking cleanliness with morality can cause people to literally attempt to “wash away their sins.” People who recalled an unethical (versus ethical) deed showed a stronger preference for cleaning products, and washing their hands made them feel as though their morality had been restored (Zhong and Liljenquist 2006).

#### *THE EFFECT OF METAPHORS ON CONSUMER BEHAVIOR*

Despite a substantial influence in experimental psychology, PSS and related theories have been largely unexplored in consumer research. An exception that has indirectly drawn on the PSS framework is research examining how consumers think and speak about their experiences. For example, Zaltman and Coulter (1995) attempt to understand consumer cognition by studying the metaphors consumers use when speaking about advertising, brands, and products. Consistent with Barsalou (1999), Zaltman and Coulter argue that thoughts are represented as images rather than words. Furthermore, they argue that these images appear in metaphoric language and that researchers can gain insight into mental representations by examining people’s choice of metaphor. This theory has received some support from consumer research. For example, people used elaborate metaphor, as well as bodily movement, to convey their hedonic experience of an art museum (Joy and Sherry 2003).

If metaphors influence mental representations, metaphors may also influence judgments and decisions. Investigating this possibility would advance existing research in two ways. First, this would be an initial substantive effort to apply PSS to consumer behavior, and second, these findings would advance the understanding of PSS. Despite the breadth of findings in this domain, existing support for PSS has primarily been restricted to differences in processing latencies (e.g., Meier and Robinson 2004) or relatively inconsequential judgments (e.g., Schubert 2005). Indeed, one of the only investigations of PSS on judgments was a recent finding suggesting that people judged animals with more respect when they were given a higher vertical position on a computer monitor (i.e., Schubert 2005, Study 6). As intriguing as this finding is, it was observed only for high-respect animals, and as Schubert (2005) suggests, it may not extend to targets that are more explicitly understood. Investigating the tenets of PSS within the domain of consumer behavior enables us to determine whether these effects hold for conscious judgments that have potentially real consequences.

Applied to the topic of this article, PSS posits that thinking about cardinal direction may conjure the well-learned associations between cardinal direction and vertical position. Thus, the term “north” may evoke memories that are consistent with its being above “south,” and “going from south to north” may evoke memories consistent with travel-

ing upward. Reliance on these memories may cause people to judge northbound travel as proceeding uphill and southbound travel as proceeding downhill, and because gravity makes uphill travel more onerous, people may judge northbound travel as more effortful, more difficult, more time-consuming, and costlier than southbound travel. On this basis, we predict the following:

- H<sub>1</sub>: Consumers associate “north” with “up” and “south” with “down.”
- H<sub>2</sub>: Consumers expect northbound travel to take longer than southbound travel.
- H<sub>3</sub>: Because northbound travel is believed to be more difficult, consumers expect northbound services (e.g., shipping a package to a northern location) to cost more than southbound services.
- H<sub>4</sub>: Because southbound travel is believed to be easier, consumers express greater intentions to visit a store that is south of a reference location than a store that is north of a reference location.
- H<sub>5</sub>: The effects of cardinal direction on shopping intentions are reduced when ease of travel is less important.
- H<sub>6</sub>: The effects of cardinal direction on consumers’ judgments are reduced when the association between cardinal direction and vertical position is disrupted.

We test these hypotheses in seven studies.

#### PRELIMINARY STUDY

Although the primary focus of the article was to investigate how cardinal direction influences consumers’ judgments, it was important to first investigate whether people associate vertical position and cardinal direction in the way that we hypothesized (H<sub>1</sub>). To accomplish this, we administered a version of the implicit association test (Greenwald, McGhee, and Schwartz 1998). The results of this study (N = 41), which is described in the Web Appendix (see <http://www.marketingpower.com/jmrdec09>), reveal that people strongly associate “north” with “up” and “south” with “down.” In the remainder of the article, we investigate the consequences of this association.

#### STUDY 1

Going uphill is more difficult than going downhill, so it often takes longer to go up than to go down. If the metaphorical link between cardinal direction and vertical position leads consumers to believe that north is physically above south, they may expect northbound travel to take longer than a southbound equivalent. In Study 1, participants judged the travel time of a northbound or southbound bird. Consistent with H<sub>2</sub>, we expected them to estimate that northbound travel would take longer.

#### Method

Undergraduate student participants (N = 78) read the following information about the migration patterns of a fictional species of bird:

The *Ariely Gull*, a relative of the albatross, conducts one of the great navigational feats in the animal kingdom. The *Ariely* spends most of the year in the severe cold of the arctic [Antarctic], within a few miles of the North [South] Pole. Once a year though, in the coldest temperatures of the Northern [Southern] winter, the bird starts a migration south [north] to Frederick’s Island, an isolated volcanic outcropping on the equator

in the Pacific Ocean, a journey of more than 3,500 miles. The *Ariely Gull* spends less than a month on the island before migrating north [south] again, where it hunts and nests in the icy polar climate.

We told approximately half the participants that the bird originated at the North Pole, and we told the remainder that the bird originated at the South Pole. Participants then estimated how long it would take the bird to travel to the equator and how long it would take to return. Neither question specified the units of time to be used in responding.

#### Results and Discussion

If people judge south-to-north travel as more difficult than the north-to-south equivalent, they should also judge it to take longer. Consistent with our predictions, participants reported that the bird would take longer to go from pole to equator when it was traveling from the South Pole (M = 41.1 days) than when it was traveling from the North Pole (M = 21.1 days;  $t(76) = 2.69, p = .009$ ). Furthermore, although most participants reported identical return times (59%, 46 of 78), those who did not were more likely to believe that the return trip would take longer when the bird originated in the North Pole (67%, 12 of 18) than when the bird originated in the South Pole (8%, 1 of 14;  $\chi^2 = 11.57, p < .001$ ). This finding provides the first evidence that information about cardinal direction can influence judgments of travel time.

In the following studies, we advance our thesis, in both theory and application, by examining the direct consequences of these psychological processes for consumers’ judgments and choices. As we detailed previously, consumer behavior offers a unique opportunity to test the judgmental processes that PSS predicts. Prior research in this area has typically documented judgmental changes by observing variation in response latencies or by observing modest alterations in the assessment of ambiguous stimuli. These measures are often chosen because the effects of metaphors on judgment are assumed to be subtle and quickly corrected by conscious mechanisms. In contrast, we contend that the link between cardinal direction and vertical position operates on completely explicit judgments, and the domain of consumer decision making offers an ideal context for testing this claim. We designed the next three studies to test H<sub>3</sub>, which predicts that consumers will expect to pay more for northbound services than for equivalent southbound services.

#### STUDY 2

If consumers believe that it is more difficult to go north than to go south, they may expect prices for northbound services to be higher than prices for southbound services (Bolton, Warlop, and Alba 2003). In Study 2, we varied the information about cardinal direction and asked people to estimate shipping costs between two cities. Consistent with H<sub>3</sub>, we predicted that people would expect northbound shipping to be more expensive than southbound shipping.

#### Method

Undergraduate students (N = 54) completed a “Shipping Cost Questionnaire” as part of a longer experiment and were told that we were “trying to get a sense of people’s knowledge and intuitions about shipping and delivery costs.” After a brief cover story about the importance of transportation



commerce, participants were told that we had identified three U.S. cities and that “although it is quite possible that you have visited one or two of these towns, it is unlikely that you have visited all three. Regardless of your personal experience, please answer the question using your intuitions and experience about shipping.” The three cities (Baron Town, Aakerton, and Slovicberg) were not real places, but participants were not told this.

The critical manipulation was the presence or absence of geographical context. For approximately half the participants, the town names were printed horizontally on the page with no context at all. For the remaining participants, the three cities were identified within a line drawing of the continental United States, with Baron Town identified as being roughly in the middle of the country and Aakerton and Slovicberg identified as being approximately equidistantly north or south, respectively, of there (see Figure 1). Participants receiving this added geographical context saw either a version with Aakerton to the north or a version with Aakerton to the south. All participants were told to imagine that they were in Baron Town and to identify which of the other two towns it would be more expensive to ship to.

### Results and Discussion

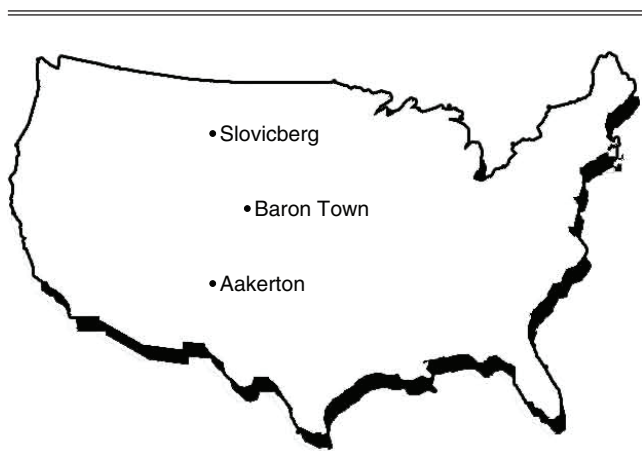
When participants had some geographical context, they were more likely to identify Aakerton as the more expensive shipping destination when it was north (58%, 7 of 12) than when it was south (14%, 2 of 14;  $\chi^2 = 5.54, p = .018$ ) of Baron Town. When no geographical context was present, estimates fell roughly in the middle of these two estimates (33%, 9 of 27). It seems that consumers judge northward movement as being more difficult. As a consequence, they believe that it is more expensive to ship an item in that direction.

### STUDY 3A

Study 2 found an effect of cardinal direction in a situation in which people were forced to choose between options. This enabled us to observe condition differences even if the association between vertical position and cardinal direction exerts no more than a tiebreaking influence. To test whether the metaphor exerts more than a tiebreaking influence,

Figure 1

AN EXAMPLE OF THE MAP USED IN STUDY 2



Study 3a manipulated cardinal direction and asked people to estimate costs.

### Method

Undergraduate students ( $N = 81$ ) at a private northeastern university participated in an experiment on moving costs. They began by reading a paragraph that asked them to imagine themselves moving between two cities in New Mexico (a state the participants had little familiarity with) to pursue a recent job promotion. All participants were instructed to imagine that the cities were approximately 20 miles apart, that they were moving from a one-bedroom apartment to another, and that they were hiring a moving company to pack and move their belongings. For approximately half the participants, the scenario described the move as being 20 miles to the north, and for the remainder, the move was 20 miles to the south. All participants then answered two questions about the cost of the move. The first question presented participants with a seven-point scale anchored at \$500 on the low end and then increasing in \$500 increments to \$3,500. The subsequent item asked participants to answer an open-ended version of the same question. Because our manipulation was subtle and therefore easily ignored, we included a measure at the end of the study that was designed to identify participants who did not read the instructions carefully (Oppenheimer, Meyvis, and Davidenko 2009; see also Simmons and Nelson 2006, Study 12).

### Results and Discussion

We excluded 13 participants who failed the measure of attention and 3 more who failed to answer the second question, which left final samples of 68 and 65 for the two dependent variables.<sup>1</sup> As we predicted, participants who imagined moving north indicated a higher price on the scale ( $M = 2.82$ ) than those who imagined moving south ( $M = 1.94$ ;  $t(65) = 2.83, p = .006$ ). This difference was further reflected in the open-ended prices; participants expected the move north to be 80% more expensive ( $M = \$1,550$ ) than the move south ( $M = \$857$ ;  $t(62) = 2.23, p = .030$ ).

Participants reported that it would cost more to move north than to move south. Although it could be argued that the effects observed in Study 2 were attributable to reliance on a tiebreaking strategy, this criticism cannot apply to the effect of cardinal direction on ratings and prices observed in this study.

Although Study 3a suggests that these effects are not limited to a tiebreaking strategy, it is difficult to assess the real impact of the manipulation relative to other variables. Furthermore, given the peculiarity of the findings, we believed that it was important to replicate the results. Study 3b used a similar paradigm but with a different population of students. In addition, we manipulated both cardinal direction and the distance of the move. Thus, we can compare the effect size of the cardinal direction manipulation with the effect size of the moving distance manipulation.

<sup>1</sup>Including the 13 participants who failed the measure of attention weakens the results, but the hypothesized effects remain significant (both  $ps < .05$ ).

STUDY 3B

Method

Undergraduate students (N = 119) from a large western public university completed this study as part of a larger experimental session in partial fulfillment of a course requirement. We replicated the design of Study 3a with a few changes. First, data from Study 3a suggested that, in general, price estimates were clustered toward the low end of the scale, so we used a new range of scale values in an effort to encourage participants to use the full scale. When estimating moving costs, participants first reported their response on a seven-point scale ranging from “less than \$100” to “\$1,300 and over.” Second, on the off chance that there was something about New Mexico that increased the likelihood of finding the effect, we eliminated this piece of information and made reference to the two cities without a specific state reference. Third, because of the circumstances of the experimental administration, we could not administer the check on whether participants read the instructions. Finally, and most important, we orthogonally manipulated the cardinal direction of the move (approximately half the participants imagined a move from north to south, and the remainder imagined a move from south to north) and the distance of the move (approximately half the participants imagined a 200-mile move, and the remainder imagined a 2000-mile move). All participants estimated how much the move would cost, first on the seven-point scale described previously and again by providing an open-ended cost estimate.

Results and Discussion

We replicated the primary findings of Study 3a; participants reported that it would cost more to move north than it would to move south ( $M_s = \$966$  versus  $\$731$ ;  $F(1, 113) = 6.59, p = .012$ ).<sup>2</sup> Furthermore, though much less noteworthy, participants reported that it would cost more to move 2000 miles than it would to move 200 miles ( $M_s = \$1,042$  versus  $\$554$ ;  $F(1, 113) = 41.03, p < .001$ ). The interaction between distance and cardinal direction was not significant ( $F(1, 113) = 1.69, p = .20$ ).

It is worth noting that the overall design of our dependent measures in Studies 3a and 3b (a rating scale immediately preceding an open-ended measure) might artificially constrain the open-ended cost estimates. Nevertheless, these estimates are useful for quantifying the size of the cardinal direction effect in terms of the size of the distance effect. Indeed, the distance effect suggests that participants in this study priced a move at approximately \$.27 per mile. When considered in these terms, it seems that participants expected a move north to be worth approximately 870 miles more than an equivalent move south. Thus, information about cardinal direction seems to have a consequential and substantial influence on price expectations.

<sup>2</sup>We excluded two participants who estimated that the move would cost \$5,000 (one each from the northbound and southbound conditions). Although this estimate is not wholly inaccurate, it was nevertheless three standard deviations above the mean.

STUDY 4

If consumers believe that it is more difficult to go north than to go south, they may be more persuaded by marketing communications framing a retail location as south rather than north of a reference location. Study 4 tests this hypothesis by manipulating a coupon’s framing of a store location and asking people to report their likelihood of redeeming the coupon. Consistent with  $H_4$ , we expected consumers to express greater intentions to redeem the coupon when the store’s location was advertised as being south of a reference location rather than north of a reference location.

Method

In a larger experimental session, undergraduate students (N = 171) at a private northeastern university were shown a copy of a coupon for \$1 off any purchase at “Ashley’s Ice Cream.” An instruction, written in a smaller font at the bottom of the coupon, described the location of the ice-cream shop in one of two ways. For some participants, the store’s location was described as one block north of a reference street, and for the remaining participants, it was described as one block south of a reference street. The location described was real but in a different city than the participants. The coupons appear in Figure 2. Participants used nine-point scales to report how likely they would be to use

Figure 2  
THE NORTH- AND SOUTH-FRAMED COUPONS USED IN STUDY 4



the coupon (1 = "very unlikely," and 9 = "very likely"), whether a trip to the shop would be worth the effort (1 = "definitely not worth the effort," and 9 = "definitely worth the effort"), and how difficult they anticipated it would be to get to the ice cream shop (1 = "not at all difficult," and 9 = "very difficult").

### Results and Discussion

The three measures were highly correlated ( $\alpha = .76$ ). We reverse-scored the "difficulty" item and averaged the measures so that higher numbers indicated greater intentions to visit the shop to redeem the coupon. As we predicted, participants expressed greater intentions to redeem the coupon when it described the shop as being to the south rather than to the north of a reference location (Ms = 6.31 versus 5.67;  $t(169) = 2.10, p = .038$ ).

Despite the subtlety of the manipulation, consumers nevertheless showed a preference to visit the southern rather than the northern location. Moreover, this study showed that the mere framing of a location as north or south of some reference location can affect intentions to shop there. Thus, marketing communications that emphasize that a store is south of some reference point may be particularly effective because of the implication that such stores can be conveniently reached.

Although southward locations may be preferred when convenience is important, this effect might be expected to disappear when quality is a more important consideration than convenience. Indeed, there are many consumption situations in which people are willing to expend extra effort for what they believe is a better product. If people shop for an item that is not worth exerting considerable effort to acquire, they may, as Study 4 suggests, take the "easy" route and go south. However, if acquiring an item is worth exert-

ing effort, people may care less about convenience and therefore give less weight to cardinal direction when choosing a shopping destination.

In Study 5, we tested this possibility by asking people to choose between northern and southern stores when shopping for either a special or a routine good. We expected people shopping for a special item to care more about product quality than about shopping convenience. Thus, consistent with  $H_5$ , we expected participants to choose to shop at the "easier" southern location when they imagined shopping for a routine replacement good but not when they imagined shopping for a special, high-quality good.

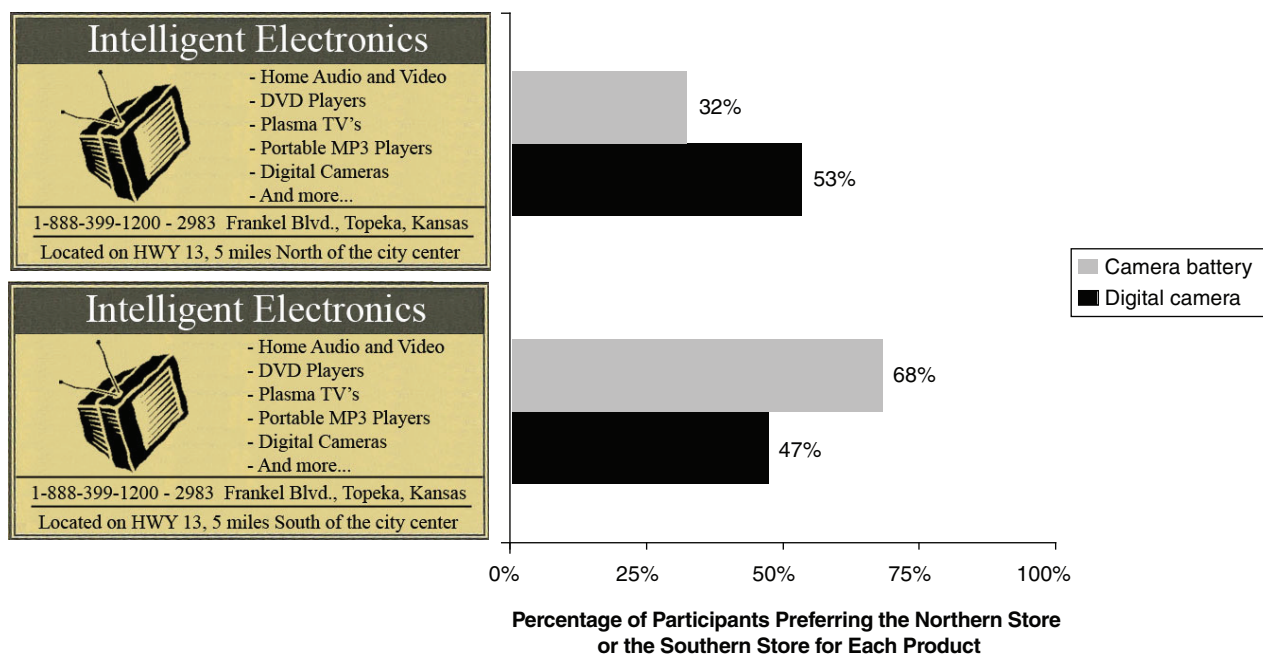
### STUDY 5

#### Method

Undergraduate students ( $N = 105$ ) at a private northeastern university completed a questionnaire about "Advertising and Shopping Decisions," which showed two advertisements ostensibly taken from the Topeka, Kan., telephone book for electronics stores in that region. Topeka was chosen for these stimuli because most participants were unfamiliar with that region of the country. The advertisements were similar, but the stores differed slightly in their geographical placement: One store was five miles north of Topeka, and the other was five miles south (see Figure 3). Store names (Electronic Solutions and Intelligent Electronics) and position on the page (left versus right) were counterbalanced and did not exert any main or interactive effects on the dependent measure.

After examining the two advertisements, participants were told to assume that they were in the center of Topeka, and they were given one of two possible shopping goals. Approximately half the participants were asked, "If you wanted to buy a battery for your digital camera, and you

Figure 3  
THE EFFECTS OF CARDINAL DIRECTION AND PURCHASE TYPE ON STORE CHOICE (STUDY 5)





knew that both stores carried the item, which would you drive to?" The remaining participants answered a similar question, except that they were given the goal of purchasing a "state-of-the-art digital camera" instead of a camera battery.

We predicted that when seeking a relatively routine replacement item, such as a battery, people would choose the store that was easiest to get to and therefore would choose the store to the south. However, when seeking a more unique item, people would be less sensitive to travel convenience and would not show any effects of geographical position.

### *Results and Discussion*

Consistent with H<sub>5</sub>, people were more likely to choose the southern store when shopping for a camera battery (68%, 34 of 50) than when shopping for a digital camera (47%, 29 of 55;  $\chi^2 = 4.59, p = .032$ ). Furthermore, the pattern of results matched our predictions exactly; battery-buying participants showed a south-store preference ( $\chi^2 = 6.48, p = .011$ ), whereas camera-buying participants showed no preference one way or the other ( $\chi^2 = .16, p = .69$ ).

This study suggests that the metaphor linking cardinal direction to vertical position influences choices only when travel ease is important. People chose the "easy" southern store when shopping for a replacement item, but they were indifferent when shopping for a high-quality item.

It could be argued that these results are consistent with a process that is entirely independent of the association between vertical position and cardinal direction. Perhaps people just believe that north is "higher quality" and make choices consistent with that belief. However, this explanation cannot account for the results of any of the previously reported studies. Moreover, as we show in Study 6, intuitions about the ease of southbound travel guide judgments even when southern locations are associated with higher quality.

### *STUDY 6*

Study 6 had two specific goals. First, we wanted to address an alternative account for the findings presented thus far. Although our theory suggests that people prefer to travel to southern stores and expect southbound services to offer lower prices because they implicitly believe that southern locations are easier to get to, it is possible that these results are instead driven by the belief that southern locations are less expensive than northern locations. Therefore, to try to rule out this possibility, we investigated the effects of cardinal direction on shipping cost expectations in a geographical context (the state of Florida) in which southern locations are believed to be more expensive. In addition, we measured not only whether people believed that it would be more expensive to ship north or to ship south but also whether people believed that there were differences in the cost of living between northern and southern Florida. We predicted that people would believe that it was more expensive to ship north than south (because of the belief that north is up), even while maintaining the belief that the southern location had a higher cost of living than the northern location (because it is more expensive to live in southern Florida).

Our second goal was to uncover part of the underlying process that we hypothesize underlies our effects. We argue that when people think in terms of cardinal direction, it activates a memory that suggests that north is up. If this is the case, stimuli that directly interfere with that memory should diminish the effects we have described thus far. To test this possibility, we manipulated the orientation of the map that participants were asked to judge. Approximately half the participants saw a right-side-up map of Florida, with north oriented toward the top of the page. The remaining participants saw an upside-down map of Florida, with north oriented toward the bottom of the page. Consistent with H<sub>6</sub>, we expected participants who viewed the right-side-up map to believe that it would be more expensive to ship northbound than to ship southbound. However, we expected this effect to be weaker among participants who viewed the upside-down map.

### *Method*

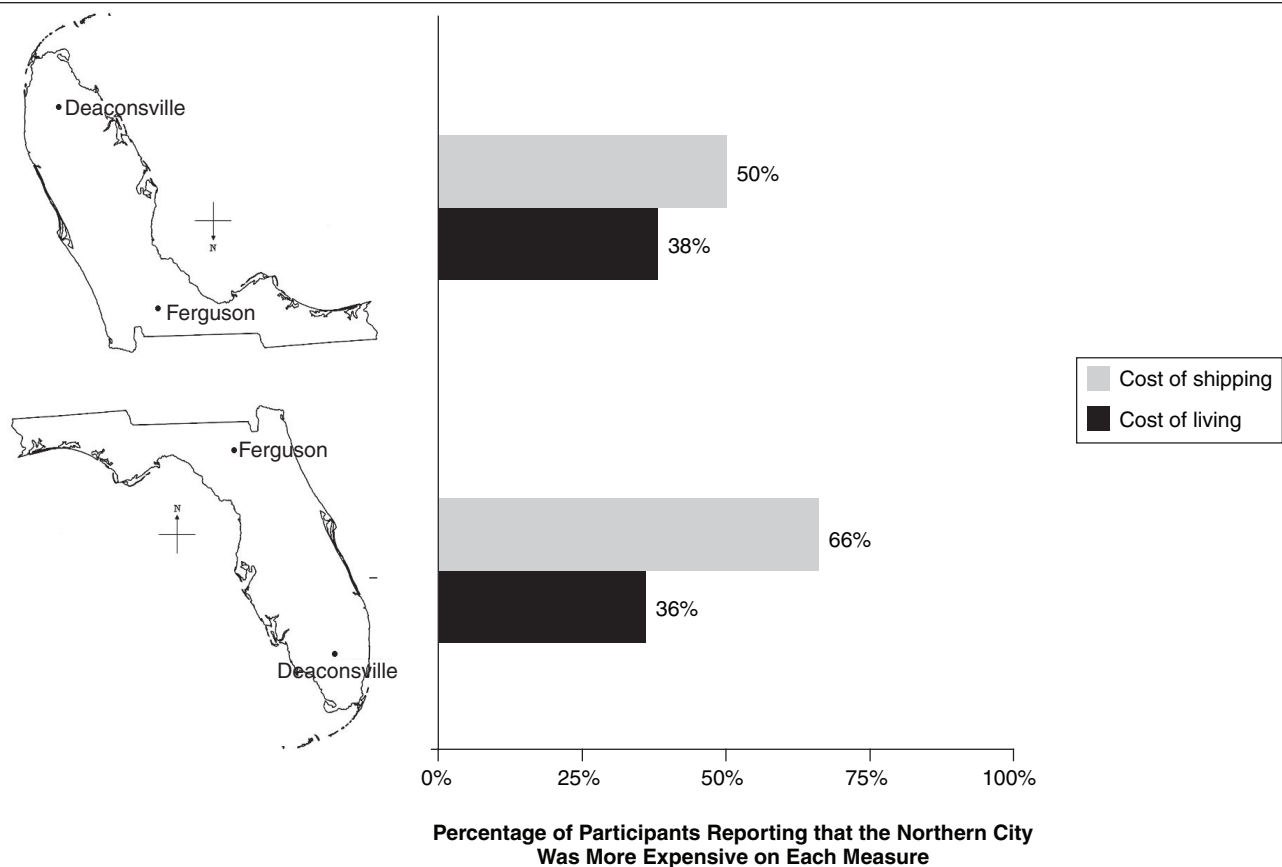
Undergraduate students (N = 203) at a large western public university were approached on campus and asked to complete a brief questionnaire about transportation and geography. The questionnaire began by stating that we were interested in how "geographical information influenced judgments of transportation and living expenses." It further detailed that we were going to ask about two (fictitious) towns in Florida (Deaconsville and Ferguson) and that a map of Florida was provided for reference. The position of each town was counterbalanced between participants. For some of the participants, this map depicted Florida as it is traditionally shown—namely, with north toward the top of the page. For the remaining participants, the image was rotated 180 degrees so that south was toward the top of the page (Figure 4 depicts the stimuli). For all participants, we explained that "this map is presented with [north/south] to the top of the page; the map is presented in this way to minimize irrelevant influences of the geographical features." Beneath the map, we asked two questions. First, participants were asked whether it would be more expensive to ship goods from Ferguson to Deaconsville or more expensive to ship from Deaconsville to Ferguson. Second, participants were asked which town would be "more expensive to live in, factoring in housing prices, groceries, etc."

### *Results and Discussion*

When north was oriented toward the top of the page, most people reported that it would be more expensive to ship north than to ship south (66.0%, 66 of 100;  $\chi^2 = 10.24, p = .001$ ), but there was no such effect when the map was rotated; slightly fewer people reported that it would be more expensive to ship north than to ship south (48.5%, 50 of 103;  $\chi^2 = .09, p = .77$ ), resulting in a significant effect of map rotation on the influence of cardinal direction information ( $\chi^2 = 6.34, p = .012$ ). This is consistent with H<sub>6</sub>. The town names did not influence any of these effects.

It could be argued that some of the previous effects reflected a belief about general cost of living differences (i.e., it is more expensive to live in the north) than any effect of the metaphoric belief that north is uphill. On the contrary, although the map's orientation significantly affected shipping cost estimates, people in this study reported that the southern town was a more expensive place to live, regard-

Figure 4  
THE EFFECT OF MAP ORIENTATION ON PERCEPTIONS OF SHIPPING AND LIVING COSTS (STUDY 6)



less of whether the map was drawn with north at the top of the page (64.0%, 64 of 100;  $\chi^2 = 7.84$ ,  $p = .005$ ) or with south at the top of the page (60.2%, 62 of 103;  $\chi^2 = 4.28$ ,  $p = .039$ ).

Taken together, these findings considerably advance the central thesis of this research. First, and most critically, when a map depicted northern locations to be below southern locations, the effect of cardinal direction on shipping cost expectations was eliminated. This result is consistent with the idea that the observed effects originate in the metaphoric association between cardinal direction and vertical position. Second, these findings further demonstrate that the effects are not simply due to a belief that southern locations are less expensive than northern locations, because participants in both conditions believed that the southern location was more expensive.

#### GENERAL DISCUSSION

We reported seven studies that demonstrate that the metaphoric association between cardinal direction and vertical position is pervasive and consequential. Indeed, information about cardinal direction can affect consumers' judgments of time, effort, and cost. Specifically, because they associate north with up and south with down, consumers expect northbound travel to be more time-consuming (Study 1), less convenient (Studies 4 and 5), and costlier (Studies 2, 3a, 3b, and 6) than southbound travel.

In addition to demonstrating the main effects of cardinal direction on consumers' judgments, we also identified two moderators of these effects. First, we found that people do not prefer the inferred convenience of southern locations when they are in the market for an expensive, high-quality good, presumably because ease of travel is unimportant in this case (Study 5). Second, we found that presenting people with an upside-down map eliminates the effect of cardinal direction on shipping cost expectations (Study 6). This finding strongly suggests that the metaphoric association between cardinal direction and vertical position is responsible for the effects we observed. Indeed, when the belief that "north is up" is disrupted, the effect of cardinal direction on consumers' judgments is disrupted as well. Taken together, these results suggest that metaphoric associations can meaningfully affect conscious, consequential judgments.

This research also leaves some open questions. First, although we show that people's judgments and decisions reflect a belief that north is physically above south, we do not know whether this belief is mediated by the activation of a visual representation. On the one hand, PSS theory suggests that frequent exposure to maps that depict north above south can cause people to encode, and subsequently retrieve, a visual representation that is consistent with this relationship. On the other hand, metaphoric associations need not evoke visual representations to exert powerful effects on judgment (Zhong and Liljenquist 2006). Indeed,



it is possible for people to learn the metaphoric association between cardinal direction and vertical position without ever seeing a map. For example, repeatedly listening to speech implying that north is above south may reinforce the belief that northern locations are uphill and that northbound travel is therefore difficult. Consistent with PSS theory, our view is that frequent exposure to maps probably leads to the creation of a visual representation that people retrieve when they think about cardinal direction. However, the effects described in this article are not dependent on this unconfirmed assumption, because they should hold even if the association between cardinal direction and vertical position is not perceptual in nature. We look forward to further research that more closely examines the nature of metaphoric representations.

Second, this research did not explore all the boundaries of these effects. For example, if people judge northbound travel to be difficult because they believe that upward travel is difficult, manipulations that make upward travel seem easier (e.g., having people hold helium balloons) may make northbound travel seem easier. It is also possible that our effects would vary by location. Although our studies found the same effects using participants from East Coast and West Coast universities, it is possible that people living elsewhere, especially in places with physical barriers (e.g., mountains) to the south, would have different associations between cardinal directions and vertical orientation. More generally, perhaps there are individual differences in the strength of the associative link between cardinal direction and vertical position. In general, people who exhibit a weaker association between north and up should be less likely to show the effects we document here.

Throughout this article, we considered how the metaphoric link between cardinal direction and vertical position shapes consumers' judgments and choices. Although consumer research has largely ignored the interaction between metaphors and mental representation, it is worthwhile to consider these findings in the light of some of the qualitative research that has been conducted in similar domains. As we described in the beginning of this article, Zaltman and Coulter (1995) suggest that analyzing metaphor usage provides insights into consumers' thoughts. We extend this insight by suggesting that changing the metaphors consumers use can change consumers' thoughts. For example, consider consumers' perceptions of time. Researchers have suggested that there are individual differences in consumer "timestyles," characterized by the metaphors people use to describe the passage of time. Whereas some people think of time as a "map" helping guide their progress toward a goal, others think of it as a "river" pulling them along in different directions beyond their own control (Cotte, Ratneshwar, and Mick 2004). Although these metaphoric timestyles may be stable and generally characteristic of how people perceive the world, the current work implies that a change of metaphor may also change perceptions. For example, consumers who typically perceive time as a river may be more efficacious in their goal pursuits when prompted to describe time as a map (for related research, see Boroditsky 2001).

For marketing managers, our findings give clear prescriptions for the construction of promotional materials. Firms that rely on a customer base that maximizes ease while minimizing expense should try to frame their location to

reflect a southern direction, or at least a downward vertical position (Study 4). There is evidence that some managers are already drawing on the theory of PSS. For example, the enticement to "Come on down!" is prevalent in the price-driven world of discount merchandise, a prevalence that possibly reflects the slogan's success.

Alternatively, when we consider how quality-seeking consumers judge the goods they receive from luxury firms, such firms may want to use the opposite strategy. Study 5 showed that people do not favor a southern location when considering purchasing an expensive product. However, this finding only scratches the surface. If it is more difficult to go north, people might expect to find higher quality in northern-framed locations (Kruger et al. 2004; Morales 2005). Although this is an admittedly speculative possibility, when customers are shopping for quality, perhaps the best enticement should be to "Come on up!"

Beyond the specific relationship between cardinal direction and vertical position we investigate herein, we believe that marketing managers can greatly benefit from more generally applying perceptual models of cognition. If consumer thoughts are fundamentally perceptual, marketers should not merely try to understand the abstract content of consumers' thoughts but also try to understand and affect the perceptual basis of those thoughts. As both market researchers (e.g., Underhill 1999) and psychologists (e.g., Barsalou 1999) have noted, people's physical relationship with their environment may not be incidental to how they think about their environment. Rather, it may define how they think about it.

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