Seeing the Big Picture: The Effect of Height on the Level of Construal

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ABSTRACT

Drawing on research on grounded cognition and metaphorical representation, the authors propose and confirm in five studies that physical height or even the mere concept of height can impact the perceptual and conceptual levels of mental construal. As such, consumers perceiving themselves to be physically elevated or "high" are more likely to adopt a global perceptual processing and higher level of conceptual construal, while those perceiving themselves to be physically "low" are more likely to adopt a local perceptual processing and lower level of conceptual construal. This difference in level of construal also impacts product choices involving trade-offs between long-term benefit and short-term effort. Alternative accounts such as vertical distance, visual distance, and perceived power are addressed. By highlighting the novel relationship between height and construal level, these findings contribute to research on grounded cognition and construal-level theory, while also providing practical suggestions to marketing managers across a variety of domains.

Key words: height, construal level, global and local perceptual processing, grounded cognition, consumer preferences

Over the years, a number of studies in psychology and marketing have highlighted different ways in which consumer choices can be influenced by subtle contextual or situational factors such as store environment (Baker et al. 2002), ambient smells (Mitchell, Kahn, and Knasko 1995), crowdedness in the stores (Maeng, Tanner, and Soman 2013), and even ceiling height (Meyers-Levy and Zhu 2007). In this research, we examine another novel contextual factor that affects consumer decisions—perceived physical height—and investigate the extent to which perception of being high versus low affects consumers' choices. We propose that differences in consumers' perception of height can affect their mental construal and their subsequent product decisions. For example, consider a consumer choosing between a multi-function desk requiring do-it-yourself assembly and a desk with basic features that comes pre-assembled. Will the consumer focus more on the desk's functions and prefer the multi-function desk when the furniture store is located on the higher floor/level of a mall, yet focus more on convenience and prefer the pre-assembled desk when the store is located at the lower floor/level of the mall? Similarly, when a customer is meeting with her financial advisor, will she be more likely to look at the "big picture" of her investment while sitting on a higher chair compared with sitting on a lower chair? Answers to these questions are intriguing and also invaluable since they offer relevant practical guidelines for managers when they assess store locations, design consumption environments in general, and develop product promotion strategies.

Beyond the practical implications, these questions raise important issues from a conceptual point of view. Prior research in psychology has examined people's conceptual construal level[1] and differentiated between high-level mental construal, which refers to the

[1] Hereafter, unless otherwise noted, when we use the word "construal" in the paper we mean *conceptual* construal.

central aspects of a decision (e.g., performance of a product), versus low-level mental construal, which relates to the peripheral aspects of the decision (e.g., convenience). This line of research has identified perceived psychological distance as the primary determinant of people's level of construal (Trope and Liberman 2003, 2010; Trope, Liberman, and Wakslak 2007). Drawing on prior work on grounded cognition (Bargh 2006; Barsalou 1999, 2008), we propose that beyond psychological distance, the physical height at which people are or perceive themselves to be can affect their construal level and impact their consumption decisions.

Prior work on grounded cognition and metaphorical thinking (Bargh 2006; Barsalou 1999, 2008; Lakoff and Johnson 1980; Williams, Huang, and Bargh 2009) suggests that people tend to associate their physical experiences, whether bodily or simulated, with abstract conceptual meanings. For example, temperature-related concepts are used to describe sociable and humane people as "warm" and antisocial and selfish people as "cold." We propose another way in which our physical and conceptual worlds are linked: through perceived physical height and mental construal level. Because higher physical level typically leads to a more panoramic big-picture view, it may well be linked with a perceptually global processing (e.g., seeing the forest). Conversely, since lower physical level typically leads to a more restricted view, it may be linked with a perceptually local processing (e.g., seeing the trees). Based on recent research that perceptually global (local) processing is associated with a conceptually higher (lower) level of construal (Förster 2012; Förster and Dannenberg 2010; Liberman and Förster 2009a, b), we predict that a higher physical level leads to a higher level of construal while a lower physical level leads to a lower level of construal, and this difference in people's level of construal will in turn impact their subsequent consumption decisions in everyday marketing contexts.

Next we review relevant literature on construal-level theory and metaphorical thinking to develop our theoretical framework. We then report five studies that investigate our predictions

about this link between physical level, construal level, and product preferences, as well as examine the intermediary role of global vs. local perceptual processing (perceptual construal) in product preference. Across the studies, we use various manipulations of perceived physical height and different measures to assess the level of construal while ruling out alternative explanations including vertical distance, visual distance, visual experiences and perceived power. We conclude with a general discussion of our theoretical contributions to construal-level theory (Trope and Liberman 2003), grounded cognition (Bargh 2006; Barsalou 1999), and the emerging literature on the effect of subtle contextual cues on consumer decisions (Baker et al. 2002; Custers and Aarts 2010). In addition, we highlight important practical implications of our findings and offer directions for future research.

LEVEL OF MENTAL CONSTRUAL

Prior research has indicated that people construe information at different levels, which leads to differences in how they conceptually process that information. At high construal levels, people process information more abstractly, take a big-picture perspective, and focus on the central aspects; at low construal levels, they process information more concretely, take a narrow perspective, and focus on the peripheral and detailed aspects (Liberman and Trope 1998; Rosch 1975; Trope and Liberman 2003, 2010; Vallacher and Wegner 1987). For example, at a higher (lower) level of construal, people group items in broader and fewer (narrower and more) categories as they see more of the overarching big picture (unique details) (Maglio, Trope, and Liberman 2013; Trope and Liberman 2010; Wakslak et al. 2006). When describing actions such as "study for an exam," those at a higher construal level prefer descriptions focusing on the "why" aspect, such as "to do well," while those at a lower construal level prefer descriptions

focusing on the "how" aspect, such as "read a textbook" (Trope and Liberman 2010; Vallacher and Wegner 1987). Consequently, when it comes to product choice, people prefer products high in desirability (e.g., software with great features despite difficulty of use) at a high construal level, and products high in feasibility (e.g., easy-to-use software with only basic features) at a low construal level (Zhao, Hoeffler, and Zauberman 2007). In a financial context it has been shown that at a higher construal level people prefer rewards that are larger amounts even if they come with a time delay, but at a lower construal level they prefer rewards that are available sooner even if they are smaller amounts (Ainslie and Haslam 1992; LeBoeuf 2006).

According to prior research, a key determinant of construal level is the psychological distance of the event from the person's current state. As the psychological distance increases, the level of construal becomes higher (Trope and Liberman 2003, 2010). Research has identified four dimensions of psychological distance: temporal (near future vs. distant future), spatial (here vs. there), social (self vs. others), and hypothetical (likely vs. unlikely). Thus, it has been noted that events that are temporally proximal, geographically nearby, relating to someone socially close, and probabilistically more likely all lead to a lower level of construal; and as these distances increase, level of construal becomes higher (Fujita et al. 2006; Kim, Zhang, and Li 2008; Liberman and Trope 1998; Trope, Liberman, and Wakslak 2007; Zhao and Xie 2011). Interestingly, it has also been shown that when two different dimensions of psychological distance operate simultaneously (e.g., temporal and social), people adopt a high level of construal when either or both of the two dimensions are high, but adopt a low level construal only when both dimensions of psychological distance are low (Kim, Zhang, and Li 2008; Maglio, Trope, and Liberman 2013).

Going beyond the traditional drivers of construal level, our research proposes another factor that affects the level of construal and suggests that physical height, or even the mere

concept of height, can influence people's level of mental construal. We argue that height is distinct from and independent of spatial distance (although, arguably the two may be hard to disentangle – more on that later), which has been identified previously in the literature as influencing the level of construal (Fujita et al. 2006). We draw on prior research on grounded cognition, in particular the scaffolding framework (Bargh 2006; Barsalou 1999, 2008; Williams, Huang, and Bargh 2009), and prior work on GLObal and LOcal processing MOdel (GLOMO, or the perceptual level of construal; Förster 2012; Liberman and Förster 2009a, b) to propose a link between perceived physical level and the more abstract meaning of construal level.

METAPHORICAL ASSOCIATION BETWEEN HEIGHT AND CONSTRUAL LEVEL

Research on grounded cognition suggests that most abstract psychological concepts are metaphorically based on concrete physical experiences (Asch 1958). Similarly, Lakoff and Johnson (1999) argue that metaphors based on physical senses allow people to think more abstractly by linking the physical sensory experiences to the more abstract conceptual notions. For example, people who are primed with the physical experience of warm temperature (holding a warm cup of coffee) are more likely to judge an unknown person as likeable and friendly (socially warm) than are people who hold a cold cup of coffee (Williams and Bargh 2008). Other research has shown that physical weight is associated with importance (Zhang and Li 2012), and cleaning one's hands is associated with removing guilt of past transgressions and post-decisional dissonance (Lee and Schwarz 2010). The key premise underlying these and related findings is that bodily states can be associated with cognitive activity (Barsalou 2008).

One type of concrete experience that has been metaphorically linked to a variety of different abstract concepts is physical height. Recent research has highlighted the association of

verticality with affect, power, morality, and ability, among others. For example, work on spatial metaphors has found that "up" is perceived to be more positive and "down" more negative (Meier and Robinson 2004). Further, "up" is perceived to be more powerful and "down" less powerful (Meier and Dionne 2009). Other research in this stream of work has found that people associate high and low respectively with morality and immorality (Meier, Sellbom, and Wygant 2007), and with judgments of higher and lower ability (Sun, Wang, and Li 2011).

Why might height be related to level of construal? Recent research on grounded cognition has proposed the concept of scaffolding—a natural process through which people integrate new concepts with extant knowledge structures (Bargh 2006; Williams, Huang, and Bargh 2009). Specifically, people acquire physical concepts from direct experiences during their infancy and childhood, gradually developing more abstract and complex 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. Over time, with an incidental activation of the more basic physical concept (which may even occur outside direct experience), the higher-level concept is likely to be activated automatically due to the metaphorical link between the two (Bargh 2006; Williams, Huang, and Bargh 2009). The notion is consistent with the theoretical framework of grounded cognition, which suggests that merely imagining a physical experience can change people's attitude or behavior rather than necessarily requiring a change in bodily state (Barsalou 2008; Elder and Krishna 2012).

Applying the idea of scaffolding to physical height and its associations, we suggest that most people acquire the knowledge from their earlier direct experiences that being physically higher usually leads to a wider physical view from one's vantage point and being at a physically lower level leads to a more restricted view. Over time, this association between physical height and perceptual perspective becomes well-grounded in people's mind such that the activation of

the more basic concept of height can automatically activate the corresponding perceptual processing. Specifically, the concept of height will be linked to the metaphorical meaning of global processing at a perceptual level (i.e., seeing the big picture) even if one is not directly viewing things from a physically high level, and the notion of a lower physical level will be linked metaphorically to local processing at a perceptual level (i.e., seeing the details) even if direct physical view is not affected. Based on this line of reasoning and prior research on scaffolding, we suggest that perceived physical height or even the mere concept of height will activate extant knowledge structures regarding the association between height and perceptual processing that one would have acquired over time beginning with one's early development.

Recent work has shown that global versus local perceptual processing can represent the perceptual level of construal, and more importantly, perceptual and conceptual level of construal are linked such that global perceptual processing is related to a higher level of conceptual construal, while a local perceptual processing is related to a lower level of conceptual construal (Liberman and Förster 2009a, b). Given this association between perceptual processing (or perceptual level of construal) and conceptual level of construal, we propose that height (physical height or the mere concept of height) will trigger a change of construal and impact subsequent consumer preferences. More formally:

H1: Consumers perceiving themselves to be physically higher (lower) adopt a higher (lower) level of construal and make product choices that are consistent with their level of construal.

H2: The effect of perceived height on consumer preference is mediated by the underlying differences in perceptual construal with global versus local perceptual processing.

OVERVIEW OF STUDIES

Across five studies we test the association between (perceived) physical height and construal level, as well as examine the effect of height on consumer preferences via the change of perceptual construal. A potential concern in our theorizing is that in most real-life experiences physical height is naturally correlated with visual distance (e.g., standing higher also tends to result in seeing farther away). To address this concern, in the studies where we manipulated perceived or actual physical height we took great care to control for visual distance. Further, in one of the studies (Study 5) we primed the mere concept of high or low which arguably would not involve any perceived elevation from the ground or associated visual experience. However, it is important to note that because the association between physical height and the span of physical view is already embedded in people's existing knowledge structures (scaffolding framework—Bargh 2006; Williams, Huang, and Bargh 2009), height might also simultaneously prime the concept of distance given the natural association between height and visual distance. Thus, even if our studies are able to control for perceived or actual distance in the experimental stimuli, in a certain sense it might not be possible to empirically fully disentangle height from perceived visual distance. Nevertheless, given the many different subtle ways in which we have operationalized height in our studies, and the care we took to control for actual and perceived distance across conditions, we propose that the effect of height on construal level goes beyond the effect of visual distance. Our work thus highlights the novel way in which a real or imagined change in a physical domain such as height can change one's level of construal.

In terms of the dependent variables, we employed direct assessments of construal level using classic measures such as categorization task and BIF (Behavior Identification Form) in our first few studies; we then extended the effect of height to more applied consumer choices

(including a real lottery choice) in later studies. Further, in Study 4 we tested the intervening role of perceptual processing/perceptual level construal in the effect of height on consumer preferences. Across these studies we rule out a number of alternative explanations such as vertical distance, visual experience and perceived power besides visual distance that we discussed above.

STUDY 1: THE EFFECT OF IMAGINED HEIGHT ON BIG-PICTURE ORIENTATION

In Study 1, we show initial evidence for the effect of height on construal by asking people to imagine being on the upper or lower level of a building while keeping the vertical distance to the ground constant. Participants were asked to choose between jobs that required more of a detail orientation (implying lower level construal) versus a big-picture orientation (implying higher level construal).

Method

Forty-six students from a large North American university participated in this study for monetary compensation and were randomly assigned to one of two conditions (height: high vs. low). Participants were asked to imagine being at a job fair in a building with three levels: upper, ground, and lower. Participants in the high (low) condition were told that after seeing the signs on the ground floor, they found that the job fair was on the upper (lower) level of the building, so they walked up to the upper level (down to the lower level). We reinforced the equal physical distance to the ground in the conditions by providing participants with a cross-sectional sketch of the building showing the two levels at equal distance from the ground level (see Web Appendix).

Participants further read that after searching for a while at the job fair, two positions caught their attention, both for the same company. Job A was for the position of Business Implementation Manager, with the key responsibilities of carrying out business plans and identifying best practices and improvement opportunities. Candidates were required to have project management skills and detail orientation. By contrast, Job B was for the position of Business Planning Manager, with job responsibilities that involved developing business plans and setting overall business goals. Candidates were required to have project development skills and a big-picture orientation. Both jobs were otherwise similar in terms of salary and outlook, time commitment, and general degree, skill, and knowledge requirements.

For the key dependent variable, participants were asked to rate their preference for the jobs on two items: relative appeal of the jobs (1 = A is more appealing; 11 = B is more appealing) and relative likelihood to apply for the jobs (1 = definitely apply for A; 11 = definitely apply for B).

Results and Discussion

We created a job preference index based on the two key dependent variables (relative appeal and relative likelihood to apply; $\alpha = .97$), where a higher number represents greater preference for the job emphasizing big-picture orientation. An ANOVA conducted on this index showed that when participants imagined themselves to be on the lower level for the job fair, they indicated a greater preference for Job A, which required detail orientation; however, when they imagined having ascended to the upper level for the job fair, they had a greater preference for Job B, which required big-picture orientation ($M_{low} = 4.61$, $SD = 3.08$ vs. $M_{high} = 6.68$, $SD = 3.45$; $F(1, 44) = 4.58$, $p < .05$; see Figure 1). These results provide initial support for our prediction that even after controlling for distance, a lower physical level leads to greater

preference for detail orientation thereby suggesting a lower level construal, whereas a higher level leads to greater preference for big-picture orientation thereby suggesting a higher level construal.

Insert Figure 1 about here

While we used the context of a job fair in a building to minimize the difference in direct visual experience across the conditions, one could argue that people might have visualized a building with windows and imagined seeing farther away from the upper level compared to the lower level. Thus, being higher might have primed participants with greater visual distance in Study 1, even if the vertical distance to the ground was kept the same. To rule out this concern, in the next two studies we directly manipulate visual distance to examine if the effect of height on construal occurs above and beyond the effect of seeing far versus near. In addition, one could argue that higher (lower) level of the building might be associated with greater (lower) perceived power which might have driven the differences across conditions. Therefore, in Studies 2, 3 and 5, we also measured perceived power to rule it out as another alternative explanation for the effect.

STUDY 2: THE EFFECT OF ACTUAL HEIGHT ON CATEGORIZATION

In Study 2 we demonstrate the effect of height on construal level by manipulating actual height and employing a direct measure of construal level: categorization. In this study we manipulated height by asking participants to sit at a desk set (combination of a desk and a stool) that was either higher or lower than a normal desk set. As noted earlier, to address the potential concerns that height might be confounded with being able to see farther, and that visual distance

rather than height might be driving the effect, we also manipulated participants' view when sitting at the desk set. For the dependent variable we used a categorization task. Prior research on CLT has shown that people group objects into fewer and broader categories when they adopt a higher construal level, and they group objects into more and narrower categories when they adopt a lower construal level (Trope and Liberman 2010; Wakslak et al. 2006). Thus, we expected participants to generate fewer categories under the high compared to the low condition.

Method

Sixty-four native English speakers from a North American university with more than 50% international/visible minority students were recruited in this study for course credit and randomly assigned to a 2 (physical level: high vs. low) x 2 (view: open vs. closed) between-subjects design. The manipulations of height and view were administered session-wise. Participants completed the study in a room with eight desk sets facing the windows. In the high condition, they were seated on high desk sets with high stools (height $29^{1}/_{8}$ inches) and high desks (height 43 inches), whereas in the low condition, they were seated on low desk sets with low stools (height 9¾ inches) and low desks (height 23 inches). We paired the stools with desks of corresponding height to make sure that participants could write equally comfortably on the high and low stools, and have equal distance to the desk while seated on the stool across the high and low conditions. In addition, in half the sessions, the blinds were rolled up such that participants had an open view of the outside, whereas in the other half of the sessions, the blinds were rolled down such that participants had no view of the outside (see Web Appendix). The manipulation of the view aimed to determine the extent to which the effect of height would be observed above and beyond any effect of visual distance.

After the routine session instructions, participants were asked to complete a survey about geography. We adopted the survey from prior research in CLT and showed participants an aerial image of a fictitious city named Echuca (Maglio, Trope, and Liberman 2013; see Web Appendix). Participants were asked to look over the image and then divide it into as many regions as made sense to them. After indicating the number of regions, participants were asked to rate the desk set that they were sitting at on a scale of 1 (very uncomfortable) to 10 (very comfortable) since it was purportedly one of the new pieces of proposed furniture being considered for the common-area facilities on campus. This was done to rule out any effect of perceived comfort of the furniture. Subsequently, to address the concern with perceived power, we included a five-item power measure that asked participants to indicate how much they agreed or disagreed with the following five statements: *"I am dominant; I am in control; I am powerful; I am influential; and I get my way."* All measures were administered on 10-point scales, with higher numbers indicating greater agreement with the statements.

Results and Discussion

Categorization. A two-way ANOVA showed no main effect of view ($F(1, 60) = .21$, $p = .65$) or interaction between view and height ($F(1, 60) = .12$, $p = .73$). However, as expected, we observed a significant main effect of height ($F(1, 60) = 7.71$, $p < .01$; see Figure 2): Consistent with a higher level of construal (Trope and Liberman 2010), participants working at the high desk set divided the map into fewer regions, thereby indicating a higher construal level, compared with those working at the lower desk set ($M_{high} = 4.68$, SD = 1.93 vs. $M_{low} = 7.26$, SD = 5.03). Further contrast analysis showed that this effect holds both when participants had a blocked view (they could only see the wall, not outside), indicating equally limited visual distance ($M_{high} = 4.72$, SD = 2.14 vs. $M_{low} = 7.69$, SD = 5.07; $F(1, 60) = 4.69$, $p < .05$), as well as

when they had an open view from their desk offering equally greater visual distance (M_{high} = 4.63, SD = 1.75 vs. M_{low} = 6.93, SD = 5.13; $F(1, 60) = 3.08$, $p = .08$).

Insert Figure 2 about here

Level of Comfort and Perceived Power. A two-way ANOVA on the comfort level of the furniture showed no main effect of height (M_{high} = 2.88, SD = 2.15 vs. M_{low} = 2.60, SD = 2.14; $F(1, 59) = .40$, $p = .53$), view (M_{view} = 2.91, SD = 2.16 vs. $M_{no\ view}$ = 2.58, SD = 2.13; $F(1, 59) = .55$, $p = .46$), or the interaction between these two factors ($F(1, 59) = 2.13$, $p = .15$). Further, analysis of participants' perceived power on the five-item index of power ($\alpha = .89$) indicated no main effect of height (M_{high} = 6.42, SD = 1.20 vs. M_{low} = 6.01, SD = 1.86; $F(1, 60) = 1.20$, $p = .28$), view (M_{view} = 6.28, SD = 1.51 vs. $M_{no\ view}$ = 6.16, SD = 1.61; $F(1, 60) = .19$, $p = .66$), or the interaction between these two factors ($F(1, 60) = .12$, $p = .73$). These results therefore rule out any confounding effects of comfort or perceived power on the effect of height on construal level. This five-item power measure was also used in Studies 3 and 5, and again we found no differences across conditions. For reasons of brevity, we will not discuss the effect on the power measures later when describing those studies.

Study 2 used actual height manipulation and a classic measure of construal level to further confirm our hypothesis regarding the effect of height on construal level. In particular, this study showed that those sitting on a higher stool categorized a region into fewer groups compared with those sitting on a lower stool, suggesting that a higher physical level is associated with higher level of construal. Importantly, Study 2 also manipulated actual viewing distance, showing that even if the physical view is blocked such that those sitting at a higher level can't see any farther than those sitting at a lower level, the effect still holds. This result provides evidence in support of the claim that the effect of height on construal level is independent of

visual distance (i.e., how far or near one is able to see) or visual experiences. Finally, Study 2 indicated that these effects are not due to differences in perceived comfort or perceived power.

Although the results of Study 2 suggest that the effect of height is not dependent on perceived visual distance or visual experiences, arguably the manipulation of visual experiences might have been too subtle in Study 2 to produce any effect, especially because the students would likely have focused on the study and might not have attended to the view in front of them. Further, the use of blinds (open vs. closed) could potentially have also influenced the level of brightness in the room. To address these concerns, in Study 3 we use a more direct and stronger manipulation of visual distance to more convincingly rule it out as an alternative explanation.

STUDY 3: THE EFFECT OF PERCEIVED HEIGHT ON BIF

In Study 3 we manipulate the visual distance more directly than was done in Study 2 in addition to manipulating height to examine their independent and joint effects on construal level. In this study, as the main dependent variable we use Behavior Identification Form (BIF)—another classic measure of level of construal that has been widely used by researchers in the past (Fujita et al. 2006; Liberman and Trope 1998; Vallacher and Wegner 1987, 1989).

Method

One hundred and seven students from a North American university participated in this study in exchange for $5. Participants were randomly assigned to a 2 (perceived physical height: high vs. low) x 2 (visual distance: near vs. far) between-subjects design. The manipulations of both perceived height and visual distance were employed session-wise. All participants were asked to evaluate a pair of binoculars after using it to watch a slideshow projected on a screen in

a classroom (size of the room: 27.5 feet x 26.5 feet). Participants in different conditions were instructed to utilize the binoculars in different ways as per the experimenter's demonstration. In the near condition participants were asked to evaluate the binoculars' function of pulling objects closer, whereas in the far condition participants were asked to evaluate its function of moving objects farther away. Participants were asked to look through the appropriate end of the binoculars to get a closer or distant view, adjust the focus so they could see the sample picture clearly, and then watch the entire slideshow (played by the experimenter on the classroom screen) through the binoculars in order to evaluate the binoculars. To ensure that all participants could see the full image clearly in both the conditions, we asked participants to sit on the last two rows on the classroom, with a distance to the screen of at least 17 feet.

Our manipulation of perceived height was embedded in the slideshow, which consisted of pictures of a series of neutral objects (e.g., bottles, mugs, etc.) taken from an angle above or below the object (with equal distance to the objects; see Web Appendix). In the high condition, the pictures shown were taken from above (from a high angle); whereas in the low condition, the pictures shown of the same object were taken from below (from a low angle). Since those who view the pictures taken from a high angle feel as if they are seeing the objects from above, they will perceive themselves to be at a physically higher level; whereas those who view the pictures taken from a low angle feel as if they are seeing the objects from below and thus will be perceive themselves to be at a physically lower level. All participants saw 20 pictures, each displayed for 5 seconds. After watching the slideshow, participants were asked to rate their overall binocular experience based on a 10-point scale anchored on 1 (very negative) and 10 (very positive).

After the binoculars evaluation task, participants were instructed to proceed to a second study on action identification. We adopted the Behavior Identification Form (BIF) from prior research (Fujita et al. 2006; Liberman and Trope 1998; Vallacher and Wegner 1987, 1989) and

provided participants with a list of 21 actions (see Web Appendix). Each action was described in a manner consistent with both a high-level and a low-level construal, and participants were asked to circle the description that related best to the action. For example, locking a door was described as "securing the house" at a high level or "putting a key in the lock" at a low level. Prior research has shown that high construal level corresponds to the choice of high-level description, and low-level construal corresponds to the choice of low-level descriptions (Fujita et al. 2006; Liberman and Trope 1998). Because we argue that perception of height leads to high-level construal, and because prior research on CLT suggests that greater perceived distance leads to high construal level (Trope and Liberman 2003), we expected to observe two main effects—one for physical level and the other for perceived distance.

After the BIF task, participants were asked to refer back to the slideshow experience with the binoculars, and then to respond to two questions designed to check the effectiveness of the two manipulations. Participants first indicated the perceived distance between themselves and the pictures comprising the slideshow based on a scale of 1 (very short) to 10 (very long); they then indicated how high (elevated) the pictures made them feel based on a scale of 1 (very low) to 10 (very high). Lastly, we included the same five-item power measure used in Study 2 (and as noted before, it did not show any difference across conditions).

Manipulation Check

A two-way ANOVA with perceived distance between the participants and the objects viewed in the slideshow as the dependent variable showed a significant main effect of visual distance (M_{far} = 7.09, SD = 2.39 vs. M_{near} = 3.16, SD = 1.92; $F(1, 103) = 91.26$, $p < .001$), but no main effect of height (M_{high} = 5.33, SD = 3.03 vs. M_{low} = 5.18, SD = 2.87; $F(1, 103) = 1.04$, $p = .31$). A second two-way ANOVA with perceived height as the dependent variable showed a

significant main effect of height (M_{high} = 5.45, SD = 1.97 vs. M_{low} = 3.98, SD = 2.03; $F(1, 103) = 14.08$, $p < .001$), but no main effect of visual distance (M_{far} = 4.47, SD = 2.08 vs. M_{close} = 4.92, SD = 2.17; $F(1, 103) = .77$, $p = .38$). These results confirmed that our manipulations of perceived height and visual distance were successful. Importantly, these results also suggest that in this particular case the manipulation of perceived height was independent of perceived distance, and as such the effects of these two factors on construal were not confounded.

Results

Behavior Identification Form (BIF). Consistent with the analysis performed in prior work (Fujita et al. 2006; Liberman and Trope 1998), we coded preference for the low-level identification for any item as 0, and preference for the high-level identification as 1. These item scores were then summed to create an index of level of action identification with a possible range from 0 to 21, with higher scores indicating stronger preference for high-level action identification. As expected, a two-way ANOVA showed a main effect of perceived height (M_{high} = 15.14, SD = 3.79 vs. M_{low} = 13.09, SD = 4.47; $F(1, 103) = 8.05$, $p < .01$) and visual distance (M_{far} = 14.72, SD = 3.85 vs. M_{near} = 13.32, SD = 4.62; $F(1, 103) = 3.73$, $p = .05$; see Figure 3). The interaction between the two factors was not significant ($F(1, 103) = 2.49$, $p = .12$).

Insert Table 1 and Figure 3 about here

Comparing the difference between high and low conditions for each level of visual distance, we found that when the distance was near (i.e., when participants used the pulling-closer function of the binoculars such that the objects were pulled 8 times closer), perceived high physical level led to a significantly greater preference for the high-level construals of the action identification items compared to perceived low physical level (M_{high} = 15.00, SD = 4.03 vs. M_{low}

= 11.50, SD = 4.61; $F(1, 103) = 9.20$, $p < .01$). This contrast result confirms that the effect of perceived height on level of construal is independent of the effect of visual distance since the effect of height still manifested even when distance was held constant (and kept near). The other contrast showed that when the visual distance was far (i.e., when participants used the pushing-far function of the binoculars such that the objects were pushed 8 times farther away), the difference on the BIF score between the high and low physical level was attenuated (M_{high} = 15.28, SD = 3.60 vs. M_{low} = 14.28, SD = 4.04; $F(1, 103) = .84$, $p = .36$). While one might intuitively expect that higher physical level should lead to an even higher construal level when the visual distance is increased, our result is consistent with recent findings in the CLT literature noted earlier (Kim, Zhang, and Li 2008; Maglio, Trope, and Liberman 2013): When different dimensions of psychological distance are simultaneously involved, people's subsequent level of construal follows a sub-additive rule rather than a linear rule since they become less sensitive to the level of the second dimension. That is, the combination of two different dimensions of psychological distance, both "high," yields a similarly high level of construal as the combination of two different dimensions of psychological distance, one "high" and one "low", and does not further increase the already-high level of construal (Kim, Zhang, and Li 2008; Maglio, Trope, and Liberman 2013). Our findings are consistent with this sub-additive rule in that the combination of the high physical level and far visual distance yielded high-level construal similar to that based either on great perceived height or far distance alone.

Similarly, conducting the other set of contrasts examining the difference between the close and far conditions for each perceived height, we replicated the classic effect of distance on construal level, showing that greater distance resulted in a higher level of construal when participants perceived themselves to be at a low level (M_{far} = 14.28, SD = 4.04 vs. M_{near} = 11.50, SD = 4.61; $F(1, 103) = 6.38$, $p < .05$). However, when participants perceived themselves to be

high, the effect of distance on construal level was attenuated (M_{far} = 15.28, SD = 3.60 vs. M_{near} = 15.00, SD = 4.03; $F(1, 103) = .06$, $p = .81$), which is consistent with the aforementioned sub-additive rule (Kim, Zhang, and Li 2008; Maglio, Trope, and Liberman 2013).

Evaluation of Binocular Experience. A 2-way ANOVA conducted on participants' evaluation of their overall binocular experience showed neither a main effect of perceived height (M_{high} = 4.67, SD = 2.16 vs. M_{low} = 4.96, SD = 1.97; $F(1, 103) = .66$, $p = .42$) nor a main effect of visual distance (M_{far} = 4.86, SD = 1.91 vs. M_{near} = 4.78, SD = 2.23; $F(1, 103) = .04$, $p = .85$), nor an interaction effect of the two *(*$F(1, 103) = 2.07$, $p = .15$). These results suggest that the effect of height and visual distance was not due to any perceived differences in viewing experience with the binoculars.

Discussion

Study 3 manipulated both perceived physical height and visual distance, and replicated the effect of height on construal level using the classic BIF measure. The results of this study provide strong evidence in support of the claim that the effect of height on construal level is independent of the effect of visual distance, and that the effect of height is not observed merely because being at a higher level is associated with seeing farther away. Along with Study 2, the results of Study 3 provide strong evidence against visual distance as the alternative explanation for the effect of (perceived) height on construal level.

STUDY 4: THE EFFECT OF PERCEIVED HEIGHT ON PERCEPTUAL CONSTRUAL AND PRODUCT PREFERENCE

Thus far we have examined the effect of (perceived) height on conceptual level of construal. In Study 4, we directly test the effect of perceived height on perceptual level of construal (i.e., global vs. local perceptual processing) and extend the effect of height to people's product preferences. To assess product preference, we selected product options that involve trade-offs between desirability and feasibility features of the alternatives (Liberman and Trope 1998). As theorized earlier, based on the scaffolding framework, physical level is associated with a perceptual level of construal with either a global or local perceptual processing. Since consumers' preference toward products involving trade-off between desirability and feasibility is driven by their construal level (Liberman and Trope 1998; Zhao, Hoeffler and Zauberman 2007), we expect that the effect of height on product preferences will be mediated by the underlying differences in perceptual construal level (H2).

In this study, we adopted the same height manipulation used in Study 3 by asking participants to view pictures taken from a higher or lower angle (see Web Appendix). To measure perceptual construal level with global versus local processing, we used the classic Navon letter-identification task utilized in prior research (Hansen, Kutzner, and Waenke 2012; Liberman and Förster 2009a, b; Navon 1977). In this task, participants are presented with a series of single large letters that consist of numerous small letters. Participants are then asked to identify, as quickly as possible, a target letter (e.g., H) that appears either at the global level (e.g., a big H composed of small F's) or at the local level (e.g., a big F composed of small H's; see Web Appendix). If higher physical level evokes more global than local perceptual processing relative to lower level, those who view the pictures taken from a higher level should take more time in identifying a local target letter compared to the time taken to identify a global target letter. To gain a better understanding of the effect of high versus low physical level relative to the default, we also included a control condition in Study 4.

Method

One hundred and five students from the same university participated in the study for partial course credit and were randomly assigned to one of three conditions (high vs. low vs. control). Participants in the high and low conditions viewed a series of pictures of objects (e.g., bottles, mugs, etc.) before they identified the letters, whereas participants in the control condition did not view any pictures.

We adopted the Navon letter task procedure from recent research (Förster et al. 2006; Hansen, Kutzner, and Waenke 2012; Liberman and Förster 2009a, b). Participants were asked to sit in front of a computer for the letter-identification task and go through seventy experimental trials in total, of which six were sample trials. Each trial began with a fixation cross ("+"), which appeared for 500 milliseconds in the center of the computer screen. Next a picture of an object appeared on the screen for 4 seconds. In the high condition, the picture shown was taken from a high level; whereas in the low condition, the picture shown of the identical object was taken from a low level. After the picture, another 500-millisecond fixation cross appeared, directly followed by a letter stimulus to be identified. After 3 seconds, the next trial began. In the control condition, no picture was provided.

As mentioned earlier, the letter stimuli were large letters consisting of smaller letters (e.g., a big H composed of small F's or a big F composed of small H's). Among these different letter stimuli, each stimulus contained either a T or an H. Participants were asked to identify as quickly as possible whether this stimulus contained the letter T or H, regardless of whether T or H appeared as a big or small letter. They were asked to press the corresponding target letter (T or H) on the keyboard as quickly as possible. In total, participants saw 8 different letter stimuli (*F's in H, F's in T, H's in F, H's in L, L's in H, L's in T, T's in F, and T's in L*), each displayed eight

times randomly. When the target letter appears in big format, it is a global target (i.e., *F's in **H**, F's in **T**, L's in **H**, L's in **T***); whereas when the target letter appears in small format, it is a local target (i.e., ***H**'s in F, **H**'s in L, **T**'s in F, **T**'s in L*). Faster responses to the global target letters relative to local letters represent a more global perceptual processing, indicating a higher level of perceptual construal, whereas faster responses to the local target letters relative to global letters represent a more local perceptual processing, indicating a lower level of perceptual construal.

After participants finished the letter-identification task, they were asked to complete a seemingly unrelated task on desk preferences, which involved a trade-off between feasibility and desirability. All participants were asked to imagine purchasing a new computer desk and considering two options: Desk A (a higher-feasibility option) had a lower quality rating (rated 3 out of 5 stars), had basic features but came fully assembled such that the customers only needed to remove the cover before using it; Desk B (a higher-desirability option) had a higher quality rating (rated 4 out of 5 stars), had many advanced features (e.g., sliding ergonomic keyboard tray and elevated monitor shelf), but it came as disassembled components in a box. It was mentioned that assembly of Desk B could take 2-5 hours and involved several tasks, including screwing on 16 joints, 4 hinges, 6 T-joints, 3 drawers, and 12 Allen screws. Both desks were priced at $129 inclusive of delivery and had a one-year warranty. Participants were asked to indicate their relative preference between these two desks based on a 1- to 10-point scale, where 1 indicated greater preference toward the higher-feasibility desk (Desk A) and 10 indicated greater preference toward the higher-desirability desk (Desk B). We expected that those who were primed with low level would adopt a lower perceptual construal level with local focus, thus preferring the more feasible desk, whereas those primed with high level would adopt a higher perceptual construal level with global focus, preferring the more desirable desk.

Results

Perceptual Level of Construal. We averaged each participant's response time (in milliseconds) to global target letters (F's in **H**, F's in **T**, L's in **H**, L's in **T**) and local target letters (**H**'s in F, **H**'s in L, **T**'s in F, and **T**'s in L). A 3 (physical level: high, low vs. control) x 2 (target type: local vs. global) ANOVA with the second factor as repeated measurement showed a significant interaction between physical level and target type ($F(1, 102) = 4.55$, $p < .05$; see Figure 4A). Further contrast showed that when the target letters were big, participants identified the letter at similar speed ($M_{high} = 874.41$, $SD = 163.45$ vs. $M_{low} = 886.92$, $SD = 213.20$ vs. $M_{control} = 884.85$, $SD = 221.20$, $F(1, 102) = .04$, $p = .96$). However, when the target letters were small, participants in the high condition spent significantly more time identifying these local letters compared with those in the low and control conditions ($M_{high} = 942.15$, $SD = 194.44$ vs. $M_{low} = 852.48$, $SD = 172.60$, $M_{control} = 864.35$, $SD = 212.82$; contrast: $t(102) = 2.12$, $p < .05$). The relatively stronger effect on the small letters (and non-significant effect on large letters) is consistent with prior research, which shows that big letters are in general easier to identify and thus likely to lead to a ceiling effect, whereas small letters are generally harder to identify and are more susceptible to contextual effects (Liberman and Förster 2009a; Hansen, Kutzner, and Waenke 2012). More importantly, these findings supported our prediction that high physical level leads to relatively more global perceptual level of construal compared with low physical level. Interestingly, the results of this study also suggest that the participants' default perceptual construal tended to be local, at least as far as this particular study is concerned, given that the low and control conditions did not differ in their results.

Insert Figure 4A about here

Desk Preference. A one-way ANOVA controlling for gender (given the important role of gender in people's preference regarding assembly of the desk) showed different preferences across the conditions ($F(1, 101) = 2.80$, $p = .06$; see Figure 4B). Specifically, as expected, participants in the high-level condition indicated a significantly greater preference for the desk high on desirability (and low on feasibility) compared with those in the low-level ($M_{high} = 6.62$, $SD = 1.60$ vs. $M_{low} = 5.85$, $SD = 2.00$; $F(1, 68) = 3.73$, $p = .05$) and control conditions ($M_{high} = 6.62$, $SD = 1.60$ vs. $M_{control} = 5.76$, $SD = 1.71$; $F(1, 69) = 5.02$, $p < .05$). No difference between the low and control conditions was observed ($F < 1$).

Insert Figure 4B about here

Mediating Role of Perceptual Construal Level on Product Preference. We conducted further analyses to investigate whether perceptual construal level/perceptual processing mediated the effect of perceived height on desk preference. Because the difference in perceptual construal level was mostly driven by participants' different response time to the small letters, which is consistent with prior work (Liberman and Förster 2009a; Hansen, Kutzner, and Waenke 2012), we used participants' local perceptual processing as evidenced by the response time to small letters as the mediator. Regression analysis showed a significant effect of perceived height on the participants' local perceptual processing ($b = .20$, $t(103) = 2.04$, $p < .05$), suggesting that the perception of being at a higher level resulted in a greater response time when identifying small letters (i.e., relatively more global and less local perception) compared with being at a lower level. To test whether greater preference for the more desirable desk in the high condition (compared to the low and control conditions) was driven by different perceptual levels, we performed a series of regressions and 1,000 bootstrap resamples using Preacher and Hayes' (2008) SPSS macro, as recommended by Zhao, Lynch, and Chen (2010). To test the significance

of the indirect pathway (i.e., the path from perceived height to desk preference via perceptual processing), we considered the bias-corrected 95% confidence interval. Because this interval (-.0991 to -.0036) did not include zero, we concluded that participants' perceptual processing/perceptual construal level mediated the effect of perceived height on desk preference. A Sobel test provided corroborating evidence supporting this mediation effect ($z = -1.68$, $p = .09$).

Discussion

Results of Study 4 demonstrated the effect of perceived height on product preferences involving trade-offs between desirability and feasibility aspects, thereby providing further support for H1 in a managerially more relevant context. Importantly, using the classic Navon letter task we show that perceived height indeed changes perceptual construal level, which in turn mediates the effect of height on product preferences, thereby providing evidence in support of H2.

STUDY 5: THE EFFECT OF CONCEPTUAL HEIGHT ON REAL LOTTERY CHOICE

Studies 1–4 showed the effect of actual or perceived physical height on construal level and product preferences involving trade-off between desirability and feasibility. Because we argue that the meaning and effect of basic physical height and the more abstract conceptual perspective of height become closely linked over time, one can expect that the effect should hold even when just the meaning of height is primed in a context where it is not directly linked with physical elevation. Consequently, in Study 5, we moved away from manipulating height through changes in physical or even hypothetical elevation from the ground; instead, we relied on prior

research suggesting that a north versus south location relative to a reference point on a map is associated with the concept of high and low (Nelson and Simmons 2009). Further, we extend our findings to a real behavioral measure: an actual lottery choice where participants need to make a trade-off between a smaller sooner and later larger reward. In addition, in accordance with existing research that human perception can be highly malleable such that subtle contextual changes can have a substantial impact on decision making (Custers and Aarts 2010), we show that with a simple instruction to change their focus and thus the reference point for their current location from say, north to south, people's height perception can be changed instantly, which will then impact their level of construal as exhibited by subsequent judgments and decisions.

Method

Fifty-nine students from the same university participated in this study for monetary compensation and were randomly assigned to two conditions (perceived height: high vs. low). The study was conducted at the end of a 30-minute study session, with the basic scenario adopted from existing research (Maglio, Trope, and Liberman 2013). Participants were told that they would be entered into a lottery at the end of the study, with a 1 in 100 chance to win $50. They were further told that payment to the winner would be administered by a company called Distance 18 FundSource, an e-commerce business similar to PayPal. They were informed that a FundSource account would be set up for the winner, accessible online, into which the reward would be deposited. To control for physical distance, all participants were told that the central bank for FundSource was located in the small city of Echuca, about 2,500 kilometers away. To ensure that participants' knowledge and familiarity with actual cities did not bias the effects, the name of the city was made up by the researchers.

We provided participants with a map of North America showing the location of Echuca and the participants' current location, and asked them to draw a line between those two cities. Our manipulation of perceived height was embedded in the map. In the high condition, the home city was located north of the city of Echuca, which meant that after participants drew a vertical line between their home city and Echuca, their current location was clearly marked as above Echuca. In the low condition, the home city was located south of the city of Echuca, so that after drawing a vertical line, participants could see that their current location was at the bottom of the line, below Echuca. Care was taken to ensure that the actual physical distance between the home location and Echuca, whether to the north or south, was exactly the same on the map. Participants were then told that in the event they won the lottery, they had the option of receiving either $50 immediately after the study (smaller sooner, or SS) or $65 in three months (larger later, or LL). They were then asked to state which option they would choose if they won, and to indicate how strongly they would prefer that option over the other on a 10-point scale anchored on 1 (strongly prefer $50 immediately) and 10 (strongly prefer $65 in three months).

Next, participants were asked to focus on the city of Echuca, thereby shifting their focus away from their current location on the map to this city located north or south of it. They read that the city of Echuca was considering two slogans to promote tourism and was seeking help in deciding which slogan to adopt. The two slogans were (A) "Come to Echuca! Explore a new world to fulfill your dream!" and (B) "Come to Echuca! An easy way to explore a new world!" The main difference between the two slogans was the relative focus on desirability versus feasibility. A pre-test of these two slogans with a different group from the same population (N = 105) indicated that participants rated slogan A to be related to long-term benefits more ($M_{slogan\ A}$ = 5.29, SD = 2.64 vs. $M_{slogan\ B}$ = 4.19, SD = 2.06; $F(1, 103) = 5.69$, $p < .05$) and emphasizing the *desirability* of travelling more ($M_{slogan\ A}$ = 6.56, SD = 2.09 vs. $M_{slogan\ B}$ = 4.96, SD = 2.43; F(1,

103) = 12.97, $p < .001$) compared with slogan B. Conversely, they rated slogan B to be more related to short-term convenience ($M_{slogan\ B} = 6.38$, SD = 2.26 vs. $M_{slogan\ A} = 4.96$, SD = 2.22; $F(1, 103) = 10.50$, $p < .005$) with a greater emphasis on the *feasibility* of travelling ($M_{slogan\ B} = 5.30$, SD = 2.56 vs. $M_{slogan\ A} = 4.17$, SD = 2.42; $F(1, 103) = 5.57$, $p < .05$) relative to slogan A.

In the main study, participants then indicated how appealing they found each slogan to be as well as how much they liked the slogans, using a 10-point scale anchored on 1 (not at all) and 10 (very much). It was expected that compared to those in the "low" condition, those in the "high" condition would prefer the desirability-based slogan over the feasibility-based slogan more. The order of presentation of the two slogans was counterbalanced, and no order effect was observed. In addition, to examine if there were any differences in perceived distance, we asked participants to answer the question *"How far away do you feel Echuca is from you*?*"* based on a 1 (very near) to 10 (very far) scale. Moreover, to assess participants' familiarity with Echuca, three additional questions were administered: *"How familiar are you with Echuca?"*, *"How much do you know about Echuca,"* and *"How often do you think about Echuca?"*—all on a 1 (not at all) to 10 (very much) scale. Participants were also asked, *"How difficult do you think it would be to access the reward payment?"* to ensure that there were no perceived differences on these variables across conditions. Lastly, we again included the five-item power measure used in earlier studies and found no differences across conditions.

Results

Lottery choice. A logistic regression analysis showed that when participants focused on their current location while making the lottery choice, a greater percentage of those who perceived their current location to be high (i.e., north of Echuca) preferred the larger, later reward ($65 in three months) compared to those who perceived their current location to be low

(i.e., south of Echuca) (M_{high} = 78% vs. M_{low} = 50%, *Wald*(1) = 4.86, $p < .05$; see Figure 5A). Further analysis showed that the pattern of relative preference is consistent with participants' binary choice: those in the high condition indicated a much stronger preference for receiving $65 in three months than did those in the low condition (M_{high} = 7.23, SD = 2.82 vs. M_{low} = 4.86, SD = 3.23; F(1, 57) = 8.81, $p < .005$). By demonstrating an increased preference for the LL (larger later) financial reward in the high condition, these results further confirmed H1, suggesting once again that a high physical level or sense of the same results in a relatively higher construal level and thus greater preference for options with longer-term benefit than is true at a low level.

Insert Figure 5A about here

Slogan Preference After Shifting Focus. When participants' focus shifted to the city of Echuca to rate the two slogans under consideration, we expected that their perceived physical level would also change accordingly since human perception is highly susceptible to context cues (Custers and Aarts 2010). Specifically, because participants' focus shifted from their own city to the city on the other end of the vertical line, we expected their construal levels to flip too. For those who were south of Echuca, we predicted that after shifting their focus to Echuca, their perceived level would shift from low to high (since Echuca was to the north, and hence high), and therefore their relative preference for the desirability slogan over the feasibility slogan would be greater compared with those who were north of Echuca and now focusing on Echuca as a "lower" place on the map.

To test this, we first created a composite preference index based on two items: how appealing participants found the slogan and how much they liked the slogan (α = .96 for the desirability slogan and α = .93 for the feasibility slogan). A 2 (perceived height) x 2 (type of slogan) repeated-measures ANOVA yielded a significant two-way interaction (F(1, 57) = 4.14, *p*

< .05). Participants' preference for the desirability slogan over the feasibility slogan was significantly greater when Echuca was in the north ($M_{desirability\text{-}slogan}$ = 5.32, SD = 2.35 vs. $M_{feasibility\text{-}slogan}$ = 4.07, SD = 1.58; F(1, 21) = 5.41, $p < .05$) compared with when it was in the south ($M_{desirability\text{-}slogan}$ = 4.20, SD = 1.86 vs. $M_{feasibility\text{-}slogan}$ = 4.24, SD = 2.24, F < 1; see Figure 5B). It is noteworthy that although the preference for desirability and feasibility is similar when Echuca is in the south, the relative difference between the preferences for the desirability over the feasibility slogan changes with the location of Echuca moving from south to north (M_{north} = 1.25, SD = 2.52 vs. M_{south}= -.04, SD = 2.26; F(1, 57) = 4.14, $p < .05$), and it is this shift of relative focus on desirability vs. feasibility that we believe is illuminating.

Insert Figure 5B about here

Perceived Distance and Familiarity. Participants' perceived distance of Echuca from their current location did not differ across the two conditions (M_{high} = 7.09, SD = 2.31 vs. M_{low} = 6.92, SD = 2.03; F(1, 57) = .09, $p = .77$), confirming that our results are not driven by differences in perceived distance but primarily by differences in perceived height. In addition, no differences were observed on any of the three items assessing participants' familiarity with Echuca (all p's > .47) across conditions. Finally, there was no difference across conditions in participants' perception of difficulty in accessing the payment ($p = .56$).

Discussion

Study 5 further confirmed our prediction that perceived height can lead to the corresponding differences in construal level, as manifested in their lottery choice. When participants perceived themselves to be north (south) of another city, they indicated a higher (lower) preference for the LL award, implying a higher level of construal. However, when the

focus was shifted to the city on the opposite end of the vertical line, their level of construal reversed, resulting in different slogan preferences.

The results of this study are significant in three distinct ways. First, the effects observed in Studies 1–4 were fully replicated in this study, even though the manipulation of high versus low was done in a subtle and conceptual manner through the use of north and south locations on a map. These results show that the effects are not necessarily dependent on actual or even perceived elevation from the ground—mere priming of the concepts of high and low may be enough. Once the concept of high and low is salient, automatic activation of the higher-level construct occurs through scaffolding, and the consequent effects on construal are observed. Furthermore, the measure of perceived distance shows no difference across the two height conditions, thereby ruling it out as an alternative explanation.

Second, this study is the first to show the interesting phenomenon of a quick reversal of construal level by merely changing the focus of a person's attention to the point on a vertical line. A switch in focus from participants' current city to the other city on the vertical line changes their reference point and the perception of high versus low, resulting in a switch from one construal level to the other, reaffirming the powerful effect of small contextual cues on perception and decisions (Custers and Aarts 2010). Future studies could further explore this phenomenon to examine conditions under which not just relative but absolute reversal may be observed for both feasibility- as well as desirability-related features.

Finally, this study replicates the effects observed in Studies 1–4 using a real behavioral measure (the lottery), thereby significantly increasing the external validity of our findings.

GENERAL DISCUSSION

Our results show that a high or low perceived physical level evokes the corresponding construal level and impacts subsequent consumer preferences. Specifically, compared with a lower physical level, a higher physical level leads to a greater big-picture orientation (Study 1), broader categorization (Study 2), identification of BIF at a higher level (Study 3), greater preference for a desk with more desirability-related features (Study 4), and a preference for larger later real rewards (Study 5). All these effects are consistent with a higher level of construal as identified in prior literature (Trope and Liberman 2003). Further, our research shows that relative to being at a low physical level, being at a high physical level leads to higher level of perceptual construal with global processing, as evidenced by the results of the Navon letter task (Study 4). Importantly, the results of mediation analyses in Study 4 showed that the effect of height on perceptual construal level further drives product preferences involving trade-off between desirability and feasibility.

Across the five studies, we manipulated height differently: upper versus lower levels in a building in Study 1, higher vs. lower desk sets in Study 2, viewing pictures of the same objects taken from a high vs. low angle in Studies 3 and 4, and northern versus southern locations on a map in Study 5. The replications of the effect of height across different studies with different height manipulations and different measures of construal give us confidence in our proposed thesis that height and construal level (high vs. low) are linked in people's knowledge structures, and this association between the two concepts affects their choices and behaviors. By explicitly keeping vertical distance constant in all five studies and by manipulating visual distance in Studies 2 and 3, we ruled out alternative explanations based on perceived differences in vertical distance, visual distance or visual experiences. Further, the five-item power measures (Studies 2, 3, and 5) successfully ruled out the power account.

Theoretical Contribution and Future Research

Our results contribute to the growing research on grounded cognition, metaphorical representation, and scaffolding (Barsalou 1999; Williams and Bargh 2008; Williams, Huang, and Bargh 2009; Zhong and Liljenquist 2006) by demonstrating that the basic construct of physical height is linked to the more abstract construct of level of construal via a change of perceptual processing. While prior research has found a relationship between height and other constructs such as power (Meier and Dionne 2009), affect (Meier and Robinson 2004), morality (Meier, Sellbom, and Wygant 2007), and ability (Sun, Wang, and Li 2011), our research finds a noteworthy relationship between height and level of construal that is independent of these previously documented constructs. In fact, our findings offer a potential explanation for the effects of verticality observed in earlier research by suggesting construal level as a more fundamental factor underlying these previous effects. That is, it might be the enhanced construal level that further impacts (literally "heightens") perceived power, morality or affect, at a high physical level. For example, at a higher physical level one adopts a higher construal level, which in turn increases social distance and one's power perception.

Further, we add to recent findings in the grounded-cognition and scaffolding literature by showing another instance in which an effect on people's preferences and choices is achieved with mental simulation rather than necessarily requiring a direct bodily or physical experience. Because of the strong association height and global versus local perceptual processing that one has acquired via scaffolding (Bargh 2006; Williams, Huang, and Bargh 2009), we suggest that an activation of the mere concept of high versus low is sufficient to lead to differences in construal without a need for the actual height to be different across conditions. In a follow-up study (N = 81) we wished to find direct evidence for the association between the mere concept of high/low

and level of construal. We simply primed participants with the concept of high or low by asking them to complete a word-search puzzle in which they had to find either the word "high" or "low" ten times. We then asked participants to choose between the two computer desks as in Study 4. Consistent with the results reported earlier, more participants in the high condition chose the high-desirability/low-feasibility desk compared with those in the low condition (M_{high} = 80% vs. M_{low} = 61%, *Wald*(1) = 3.41, p = .06). These results further confirm that actual elevation from the ground or actual views from the physical location are not critical for an effect on the level of construal. The mere concept of height suffices to elicit the corresponding construal level.

Our findings regarding the effect of perceived height on construal level and product choices add to the vast stream of literature on construal-level theory (Trope and Liberman 2003; Vallacher and Wegner 1987) by showing that, beyond psychological distance, (perceived) height can lead to different levels of construal and thereby change people's decisions. Further, while most work on CLT has focused on the conceptual levels of construal with the exception of Liberman and Förster (2009a, b) which examined the perceptual level of construal, our work is among the first to investigate both perceptual and conceptual level of construals. In addition, our work is, to the best of our knowledge, the first one to highlight the quick reversal of construal level by merely changing a person's attention. Lastly, our findings show that very subtle and conceivably insignificant factors can potentially influence the way people think and behave (Baker et al. 2002; Custers and Aarts 2010).

Our study offers some interesting directions for future research with its demonstration that subtle manipulation of height perception can have significant effects. Does this mean that people who live on the top floor of a high-rise building, for example, are chronically operating at a high construal level compared to their counterparts living in basement apartments? Or do these effects occur only in response to *changes* in perceived height, and not for those in a chronic state

of higher or lower physical level? How long do these effects last, and at what point do people get acclimatized to higher or lower physical levels? Future work could fruitfully address these questions. Further, in the current work, we find that people follow the sub-additive rule for construal level when exposed to a manipulation of height and visual distance. It will be interesting to examine if height perception interacts with other dimensions of psychological distance such as temporal and social distance. The results of Study 3 suggests that the effect of height ($p < .01$) on construal might have been stronger than the effect of perceived distance ($p < .05$) – something that we did not intend to directly compare. Future research could investigate if, in fact, height can produce a stronger effect on construal level than the traditional dimensions of psychological distance. This research also suggests that perceptual construal mediates the effect of height on people's product preferences consistent with different conceptual construal levels. Future research might examine if perceptual construal level would always precede conceptual level or if the order of these two types of construal levels could be reversed. Lastly, while we showed the effect of height on construal level, future researchers could examine if the connection between height and construal level is in fact bi-directional.

Managerial Implications

Our findings have substantial implications for practitioners across a variety of domains, as shopping or consumption decisions are mostly made at a certain physical location. Because perceived higher level leads to greater focus on desirability and long-term benefits, our findings suggest that it may be more effective for stores located on a higher level of a mall to promote rich features, superior functions, or performance of their products, whereas it may be more effective for stores on a lower level to promote high convenience or ease of usage for their products. For example, in order to appeal to their customers, furniture stores might want to

consider displaying their multi-feature furniture at the upper level, while displaying their simple and convenient furniture on the lower level; or bookstores might want to display lighter reading material at the lower level, with materials requiring careful thinking on the higher level. In fact, an observational study at a major chain bookstore in the local city confirmed this approach. This chain bookstore has two floors at most of its locations: ground floor and second floor. On the ground floor which has a colorful décor, consumers find souvenirs/gifts, bestsellers of various genres, fiction, lifestyle books, etc.; whereas on the second floor which uses décor with similar wood-like colors across all sections (except the kids' section), they find "serious" books about biography, history, the arts, health, and well-being. An employee who was unaware of our main thesis informed us that books on the ground floor are organized by sections, "so each book is very easy to see and grab". However, on the second floor, books are shelved. Thus customers must search for the ones they specifically want, and "it takes a lot more effort and time to find the right one." Although a number of rationales can explain these arrangements, such observations supported our recommendation for marketers to emphasize products with long-term benefits (yet requiring more effort) on a higher store level, while emphasizing products with short-term benefits (and greater convenience) on the lower level to attract customers.

Similarly, when designing promotions, offering additional features/product add-ons might work better when the store is at a higher level or when real estate agents promote apartments on higher levels, whereas offering price cuts might work better when the store is at a lower level or when promoting apartments on lower levels. In addition, implications of this research are equally valid when more subtle differences in height are involved. For example, salespeople might consider having their clients sit at a higher chair when discussing important issues since an increased elevation would boost their clients' construal level, allowing them to see the big picture relevant to making thoughtful decisions, be it in financial, health, or other

consumption domains. In the same vein, customers test-driving SUVs (higher in height) might look for additional benefits related to product features rather than price cuts, compared with customers test-driving sedans (lower in height). In fact, to achieve an advantage similar to an SUV of providing a feeling of being "up high", the Ford Motor company, when launching the Ford Five Hundred (sedan) a while back, adjusted its seating with the so-called "Command Seating" by making it higher than regular sedans. Such adjustment in height might potentially help drivers adopt a higher level construal and value desirability-based features more. Extending these ideas to the domain of online marketing, it would certainly be interesting to explore whether by placing desirable products on the upper part of the website screen and feasible products on the lower part of that screen, managers could increase the sales of their products.

In conclusion, this research points to a provocative notion of how a small contextual factor like perception of height can influence the way people think and act. The effects of such subtle differences in our everyday lives may impact us in many significant ways. If marketers actively incorporate this effect in the selection of tools available to them in order to develop more effective marketing strategies and tactics, they may be able to influence consumers' decision-making processes and final outcomes in ways that were unavailable until now.

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FIGURE 1

STUDY 1 RESULTS: PREFERENCE FOR JOBS WITH BIG-PICTURE ORIENTATION

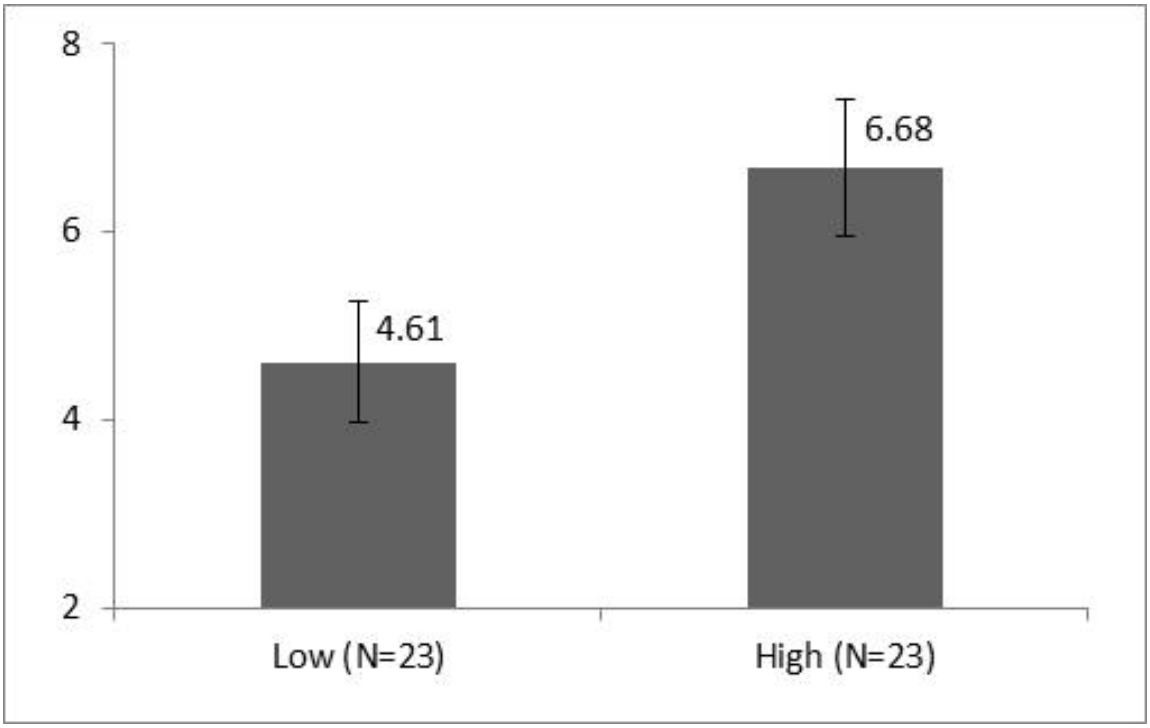

FIGURE 2

STUDY 2 RESULTS: NUMBER OF REGIONS CATEGORIZED

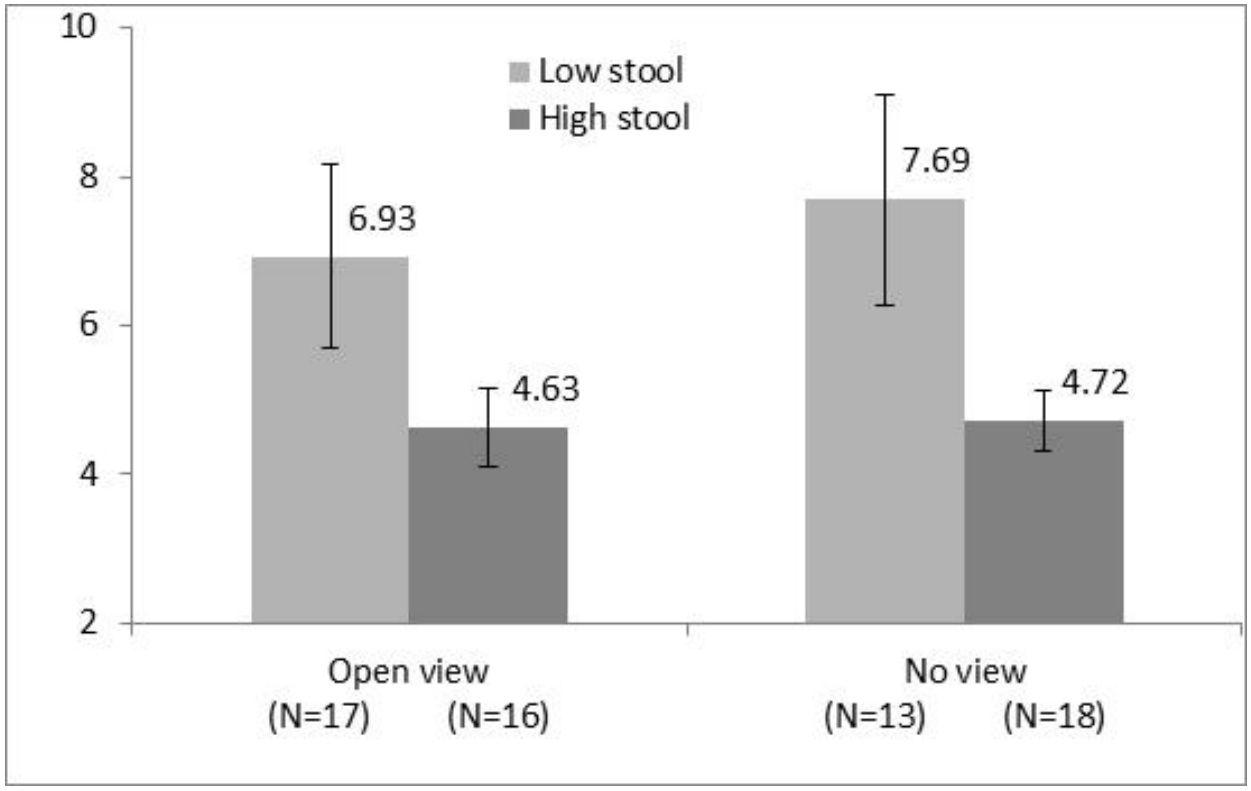

FIGURE 3

STUDY 3 RESULTS: BIF

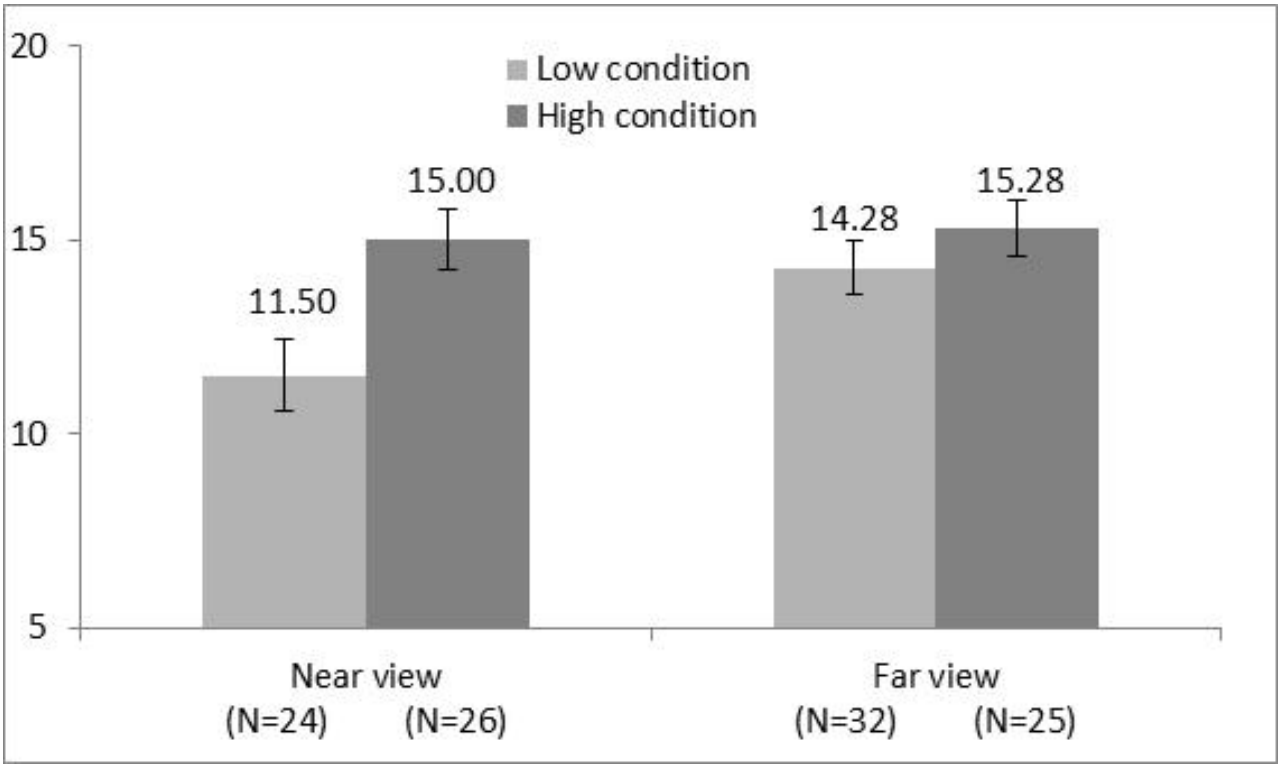

FIGURE 4A

STUDY 4 RESULTS: RESPONSE TIMES TO GLOBAL AND LOCAL LETTERS (IN MS)

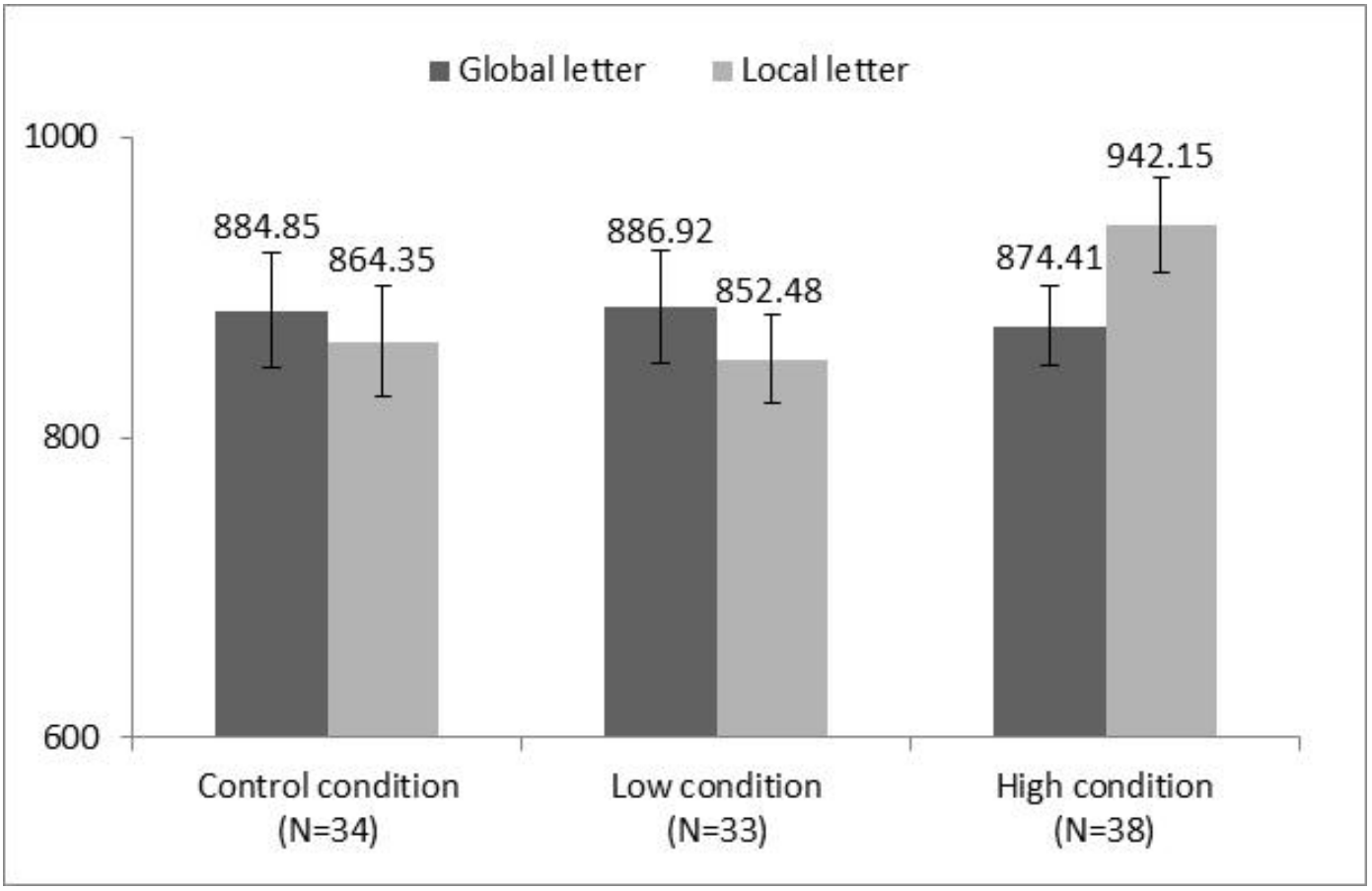

FIGURE 4B

STUDY 4 RESULTS: PREFERENCE FOR DESK WITH HIGHER DESIRABILITY

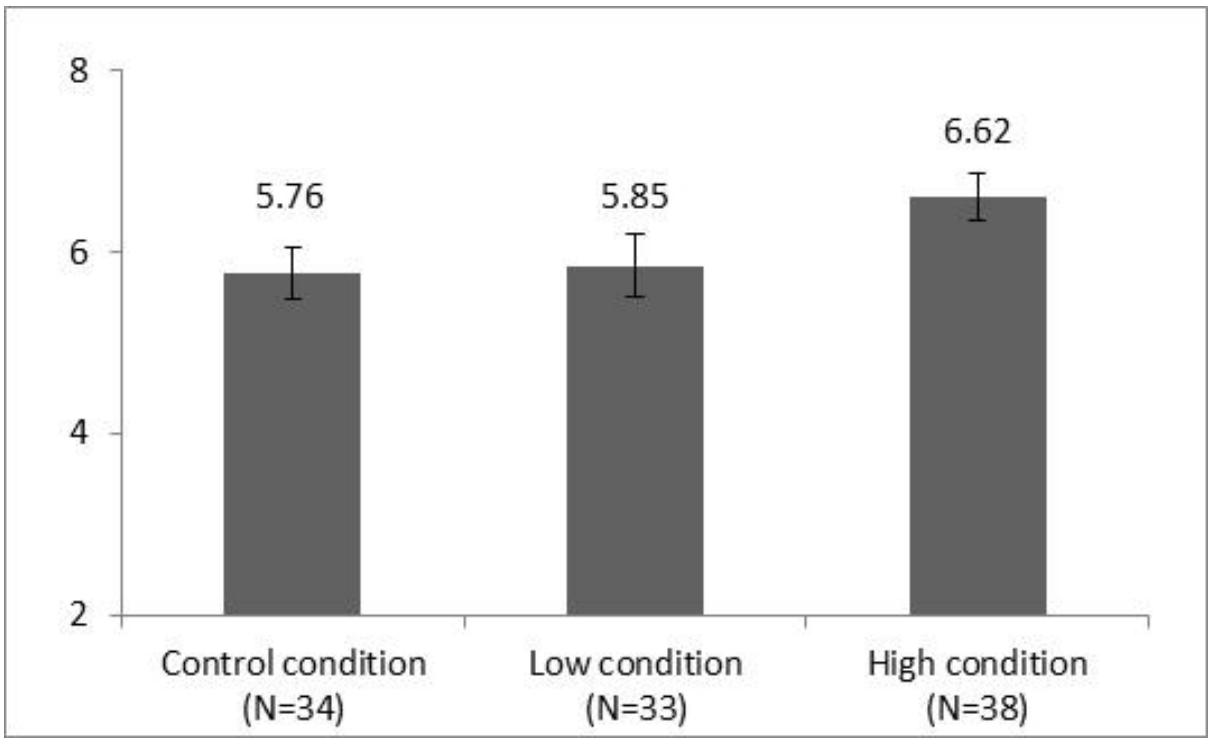
8
6
4
2
5.76
5.85
6.62
Control condition
(N=34)
Low condition
(N=33)
High condition
(N=38)

FIGURE 5A

STUDY 5 RESULTS: PERCENTAGE CHOOSING THE LATER LARGER REWARDS

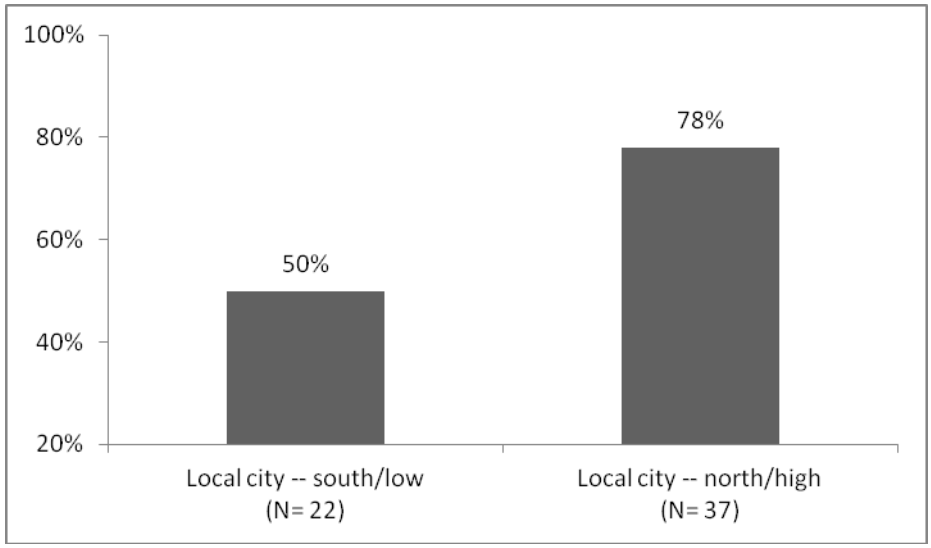

FIGURE 5B

STUDY 5 RESULTS: PREFERENCE FOR SLOGANS IN ECHUCA