Why Does Psychological Distance Influence Construal Level? The Role of Processing Mode

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The influence of psychological distance on construal level has been extensively documented in both social psychology and consumer research, with proximal (distal) events shown to induce low-level (high-level) construals. However, the extant literature takes a black box approach, as it were, to this effect by viewing it in terms of a direct association between distance and construal level, without specifying any intervening variables. The current research seeks to unpack this black box and provide more detailed process insights by identifying such an intervening variable: processing mode. We argue that people tend to rely more on visual processing when construing proximal events while engaging in a greater degree of verbal processing with regard to distal targets; in turn, visual processing is more likely to yield concrete (low-level) representations, whereas verbal processing facilitates abstract (high-level) representations. This unpacked formulation not only provides additional theoretical insight into a classic effect but also yields implications that are novel to the literature. In particular, emphasizing the role of processing mode (1) enables an identification of boundary conditions for the distance-construal effect, and (2) indicates when and why well-established consequences of psychological distance on consumer preferences can be reversed. Results from five studies provide convergent support for our key proposition and its corollaries.

Keywords: psychological distance, construal level, processing mode

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People can construe target objects and activities at a relatively high level using general, superordinate, and ends-related features, or they can construe the same targets at a lower level using specific, subordinate, and means-related features of the target. For instance, at a low level of construal, the target activity of "locking a door" may be described in relatively concrete, means-related terms (e.g., "putting a key in the lock"). Conversely, the same target activity, when construed at a high level, might be thought of in more abstract ends-related terms (e.g., "securing the house"; Liviatan, Trope and Liberman 2008).

Construal level theory (CLT; Trope and Liberman 2010) posits that psychological distance from the target is a central determinant of the level at which people construe objects and events. People tend to construe a target at a lower

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level if it is physically closer (spatial distance), is happening in the near future (temporal distance), is related closely to the self (social distance), or is real rather than hypothetical (probabilistic distance). Over the last 15 years, a vast amount of empirical evidence has accumulated in support of this elegantly simple proposition (Fujita et al. 2006a; Liberman, Sagristano, and Trope 2002; Todorov, Goren, and Trope 2007; Trope and Liberman 2010). This rich body of work has significantly advanced our knowledge regarding the conditions under which individuals are likely to engage in high- versus low-level construals, and it has also provided a framework that integrates the different dimensions of psychological distance (temporal, spatial, social, and probabilistic). In addition, the CLT framework has been used to examine how psychological distance, by shifting construal level, influences a variety of downstream judgments and preferences—both in the domain of social psychology (Fujita et al. 2006b; Henderson et al. 2006a; Liberman et al. 2002) and consumer behavior (Aggarwal and Zhao 2015; Irmak, Wakslak, and Trope 2013; Yan and Sengupta 2011).

The amount of supporting evidence leaves no room for doubt that psychological distance does indeed influence construal level and its downstream consequences. However, less is known about the specific details of the mechanism underlying this effect. This lack of detail is inherent in the most widely accepted account of the process, one based on a direct, generalized link between psychological distance and construal level (Bar-Anan, Liberman, and Trope 2006; Trope and Liberman 2010; Trope, Liberman, and Wakslak 2007). This account suggests that a link between distance and construal level initially develops because high-level construals are more likely than low-level construals to remain unchanged as one gets farther away from an object. It is therefore more useful to construe distant actions and events at a high rather than a low level. After several instances of engaging in such functionally driven construals, the effect of psychological distance on construal level becomes overgeneralized. As a result, distance continues to exert an effect on construal level even when the initial functional reasons that gave rise to the relationship are not present (Trope and Liberman 2010).

While this direct association perspective is consistent with the robust nature of the distance-construal effect, it is also something of a black box view, in that it does not get into intervening variables that may determine the impact of psychological distance on construal level. Thus this account may itself be viewed as a high-level construal of the distance-construal effect. The major goal of the current research is to unpack this black box and provide a more low-level detailed account of the effect. In particular, we draw on several related conceptual areas to specify a key intervening variable between psychological distance and construal level: processing mode. According to our conceptualization, people tend to rely more on imagery-based (i.e., visual) processing when construing proximal events while engaging in a greater degree of verbal processing with regard to distal targets. Further, visual processing is more likely to yield concrete (low-level) representations, whereas verbal processing facilitates abstract (high-level) representations. Thus the extent of visual versus verbal processing plays a key intermediary role in explaining the influence of psychological distance on construal level.

Support for such a thesis would be of theoretical interest in itself by providing more detailed, fine-grained process insights into how psychological distance influences construal level. Further, it yields testable implications that are novel to the extant literature. First, unpacking the distance-construal association allows us to identify boundary conditions for this robust effect. If processing mode is the proximal driver of construal level, enhanced visual (verbal) processing in itself should increase the tendency toward low-level (high-level) construals, regardless of psychological distance. Second, by positing that psychological distance first influences processing mode en route to its influence on construal level, the current formulation is also able to reverse some classic downstream consequences of psychological distance that have been obtained in the construal level literature. For instance, as discussed in greater detail later, while the extant literature has found that the relative importance of desirability (feasibility) considerations in consumer decisions increases (decreases) with greater distance, we predict and find the opposite when desirability is relatively more visualizable than feasibility.

To summarize, the current research first seeks to unpack the mechanism by which psychological distance influences construal level. Second, it identifies boundary conditions for this robust effect. Third, it builds on the unpacked mechanism to examine when and why established consequences of psychological distance might actually be reversed. Our investigation thus seeks to make a fundamental contribution to CLT itself. In doing so, we also contribute to consumer research, which has applied the distance-construal effect in a host of domains including persuasion (Kim, Rao, and Lee 2009a), preference construction (Irmak et al. 2013; Liberman and Trope 1998), product quality inferences (Bornemann and Homburg 2011; Yan and Sengupta 2011), and self-control (Fujita et al. 2006b), to name a few. A more nuanced understanding of the distance-construal association therefore has the potential to inform a significant body of consumer research.

THEORETICAL BACKGROUND

Visual versus Verbal Processing

Research in cognitive psychology posits that verbal processing involves symbolic representations of the object being processed and is relatively detached from sensory and perceptual aspects of that object. Visual processing, in

contrast, preserves such aspects—and is therefore akin to the processing that ensues upon direct experience with the target object (Bransford and Johnson 1973; Paivio 1971; Yuille and Catchpole 1977). For example, when thinking of a target concept such as an elephant, verbal processing could take the form of using the word (i.e., the verbal symbol) "elephant" to represent the concept. This symbol incorporates the semantic meaning of the target and can trigger associated concepts such as "patient" and "large." However, the lack of imagery means that this representation may not preserve key perceptual aspects, such as the spatial interrelationship between an elephant's tail and trunk. In contrast, visual processing of the concept of "elephant" would involve forming a visual image of the elephant that incorporates these perceptual aspects (Kosslyn 1975, 1976; Paivio 1971).

Of relevance to the current article, the two types of processing have been shown to differ with regard to their antecedents, both in terms of individual differences (such as an innate disposition to favor one processing mode over another; Childers, Houston, and Heckler 1985) and situational factors (e.g., explicit instructions to engage in a particular processing mode; Keller and McGill 1994). Building on this theme, we propose that another situational antecedent of processing mode is psychological distance: namely, people tend to process psychologically distal targets verbally while relying more on visual processing for psychologically proximal targets. Several lines of research, reviewed here, provide indicatory support for this premise.

Psychological Distance and Processing Mode

The first supportive argument is based on research linking psychological distance with implementation intentions, which are self-regulatory strategies formulated as if-then plans (i.e., "if situation X occurs, I intend to perform action Y"; Gollwitzer 1999). It has been found that when a proposed event or activity is in the distant (vs. near) future, people are less likely to form an implementation intention because the further off the event, the more likely it is that crucial factors may change in the meantime, thus detracting from the value of a current implementation intent in driving future action (Trope and Liberman 2010). Intuitively, this relationship between temporal distance and implementation intention formation seems generalizable to other distance dimensions as well. Such intentions should be of more value, and therefore people should be more likely to form them, when the event is more likely to occur (probabilistic distance), physically closer (spatial distance), and more related to oneself (social distance). Of relevance to the proposed association between visual/verbal processing and psychological distance, the goals literature suggests that the formation of implementation intentions typically involves mentally imagining the steps that must be taken to achieve a goal (Bayuk, Janiszewski, and Leboeuf 2010; Gollwitzer 1999). In an empirical examination of this idea, Steller (1992) found that participants who were asked to form implementation intentions demonstrated better performance in a subsequent unrelated task that required visual processing.

A second supportive argument for our thesis stems from research testifying to the beneficial effects of engaging in mental imagery of upcoming tasks and events (Paivio 1985; Richardson 1967). Research in this area suggests that people engage in motivated visualizing for both positive and negative upcoming events, albeit for different reasons. For negative events (e.g., an impending exam), visualizing the details of how one will take the exam can help to reduce the uncertainty and anxiety it is causing, thus enabling better performance (Richardson 1967). For positive events (e.g., an upcoming vacation), visualizing the delights in store allows individuals to engage in pleasurable anticipation, adding to their immediate enjoyment (Escalas 2004). Building off these ideas, we argue that such visualization is particularly likely to be undertaken for proximal rather than distal events. For negative events, anxiety and uncertainty reduction are more likely to be required for proximal events. Thus, for example, an exam is more likely to be viewed with anxiety if it is going to take place the next day rather than the next year. Similarly, for positive events, anticipatory savoring of the experience is more likely to provide enjoyment when the experience is closer to oneself (e.g., we are more likely to visualize our own upcoming vacation rather than that of our neighbor's). Again, therefore, these ideas converge on the premise that visual rehearsal is more likely for proximal rather than distal events.

Adding to the theoretical arguments just described, a third piece of support for our premise is an empirical one. Amit, Algom, and Trope (2009) found that participants responded to psychologically proximal objects (e.g., modern products like a car, ballpoint pen, and electric lamp) more quickly when they were presented in pictures than words. In contrast, response time for distant objects (e.g., antique goods like carriage, quill pen, and oil lamp) was shorter in the word condition than in the picture condition. This pattern is consistent with our view that psychologically proximal (distal) targets activate visual (verbal) processing. It should be noted, however, that not only do Amit et al. (2009) not posit such causality, but they also did not go on to examine how the link between distance and processing mode might explain the distance-construal effect (as we do later). Further, they also did not examine the novel implications of such an unpacked mechanism in terms of the boundary conditions and reversals examined in the current research. We elaborate on these differences in the General Discussion.

Processing Mode and Construal Levels

CLT argues that high- and low-level construals differ in several important ways: High-level construals are more

abstract, decontextualized, and consist of superordinate and essential features. Low-level construals, in contrast, are more concrete, contextualized, and consist of subordinate and secondary features (Trope and Liberman 2010). For example, a high-level construal of two children playing with a ball could be "two children are having fun." A low-level construal of the same activity might be "on a winter afternoon, two little boys are playing with a green ball in the backyard." The latter construal contains more concrete secondary information (e.g., the color of the ball, gender of the children) and is also more contextualized (e.g., when and where the children are playing; Trope et al. 2007). We suggest that at least to some extent, these major differences between low- and high-level construals may arise due to visual versus verbal processing modes.

First, verbal processing tends to generate more abstract representations; in contrast, visual processing tends to generate more concrete representations. As described earlier, verbal processing is detached from actual sensory and perceptual experience; rather, it involves transforming the target to a propositional symbol that captures its semantic meaning (Anderson and Bower 1973; MacInnis and Price 1987). In contrast, visual processing is very similar to that which ensues upon direct, tangible experience, in that such processing retains the actual sensory and perceptual features of the target—that is, aspects that are characteristic of a concrete rather than abstract representation (Kosslyn 1976; MacInnis and Price 1987; Wyer, Hung, and Jiang 2008).

A second strand of support has to do with the CLT tenet that high- versus low-level construals are associated with superordinate versus subordinate categories, respectively (Trope and Liberman 2010). Pertinently, words are often used to represent superordinate categories while images often represent subordinate ones (Shutts and Kinzler 2007; Trope et al. 2007). For instance, "means of transportation" is a superordinate category and can only be represented by words. However, within that superordinate set, subordinate categories such as "train" and "aircraft" can be represented visually. Indeed, even though many objects can be represented both verbally and visually, their visual images are usually more subordinate than the corresponding verbal symbol. For example, the word "dog" denotes all types of dogs of different breeds, colors, ages, sizes, and so on. However, the visual representation of "dog" typically involves imagining a particular dog, with many of its individual features specified (e.g., a small white male chihuahua).

Finally, visual processing is likely to generate more context-rich representations than verbal processing because visual processing requires filling in contextual details. When imagining an event, people typically need to take into consideration the context (e.g., where, when) in which the event occurred or will occur (Wyer 2004; Wyer and Radvansky 1999). If the context is not spatially and temporally constrained (i.e., the event occurs at a particular time and place), forming a mental image of an event becomes difficult or even impossible (Wyer 2004). For example, when forming a visual image of buying a computer, consumers typically visualize not only the computer itself, but also a specific store where they will buy it, and when they will make the purchase. To the extent that low-level construals are more contextualized, whereas high-level construals are relatively decontextualized, this offers further support for our argument that visual (vs. verbal) processing is likely to generate low- (vs. high-) level construals.

Thus these different strands of research all converge on the premise that visual (verbal) processing yields low- (high-) level construals. Viewing this in conjunction with our first premise, we arrive at the following prediction:

> **H1:** Psychologically proximal (distal) targets produce a greater reliance on visual (verbal) processing. In turn, greater visual (verbal) processing yields relatively low-level (high-level) construals of the target. Thus the effect of psychological distance on construal level is driven, at least in part, by the different processing modes induced by distance.

Implications

By unpacking the distance-construal association via the intervening variable of processing mode, the current formulation not only provides a more fine-grained view of the process, but it also yields implications that are new to the construal level literature. In particular, our conceptualization provides testable predictions regarding boundary conditions for the construal-distance effect and a reversal of extant findings regarding the influence of psychological distance on judgments and preferences.

Boundary Conditions for the Distance-Construal Effect. Psychological distance has been found to exert a robust effect on construal levels across contexts (Fujita et al. 2006a; Liberman et al. 2002; Todorov et al. 2007; Trope and Liberman 2010). However, if processing mode is a proximal driver of construal level, as our theorizing suggests, then those induced to engage in a visual (verbal) mode of processing should form low-level (high-level) construals regardless of psychological distance. Support for this prediction, tested in experiment 3, would represent what we believe is the first instance of attenuating the distance-construal effect. It would also provide further support for our basic premise regarding the intervening role of processing mode in driving this effect.

Reversing the Consequences of Psychological Distance. Unpacking the distance-construal association also allows us to identify when and why psychological distance may exert effects on judgments and preferences that are opposed to extant findings in the literature. We focus on a particularly well-established consequence that has also been extensively studied in consumer research,

namely, the relative importance of desirability considerations (the value of an end state) versus feasibility considerations (how to reach that end state) in preference formation (Irmak et al. 2013; Liberman and Trope 1998; Liu 2008). Because desirability refers to superordinate "why" aspects (e.g., the interest value of a lecture), whereas feasibility is concerned with subordinate "how" aspects (e.g., the timing of the lecture), the former/latter is more likely to form part of high-level/low-level construals (Liberman and Trope 1998). In accordance with the distance-construal effect, therefore, CLT predicts that the relative influence of desirability (feasibility) considerations should increase (decrease) with greater psychological distance.

Note that this prediction (greater weight attached to desirability at greater distances) follows in a straightforward manner from a view of the distance-construal effect as a direct, black box association, with a relatively distal event automatically inducing high-level construals. Since desirability is part of such high-level representations, its weight should invariably increase with distance. However, by unpacking the black box account, the current formulation is able to add nuance to this prediction. According to our theorizing, psychological distance, en route to determining construal level, first influences processing mode, with visual (verbal) processing dominant at short (long) distances. Further, previous research has shown that when consumers engage in visual processing (vs. nonvisual processing), their judgments rely more on product attributes that are easy to visualize (e.g., "hardwood floor") than attributes that are difficult to visualize (e.g., "security level"; Keller and McGill 1994; McGill and Anand 1989). Accordingly, we argue that for proximal decisions, it is the relatively easy-to-visualize attribute that should receive greater importance, whereas for distal decisions, it is the relatively easy-to-verbalize attribute whose importance should go up, regardless of the attribute's standing on the desirability/feasibility dimensions.

This inference forms the basis of a possible reversal of the classic feasibility-desirability finding. In a given decision context, if the desirability aspect is relatively visualizable and the feasibility aspect is relatively hard to visualize, our theorizing suggests that the more proximal the decision, the more it should be guided by the desirability aspect (because it is visualizable), whereas the more distal the decision, the more it should be guided by feasibility (nonvisualizable) considerations. Experiment 4 examines this prediction in a consumer decision context. Experiment 5 then extends our reasoning to another type of consumer decision trade-off (probability vs. payoff; Sagristano et al. 2002) that is related to the feasibility-desirability distinction. By obtaining results contrary to current findings in the literature, both these studies further demonstrate the value of unpacking the distance-construal association.

To summarize, the first two studies in this article examine our basic premise that psychological distance influences processing mode (experiment 1), which then affects construal level (experiment 2). The next study reinforces this argument and also establishes boundary conditions for the distance-construal effect by showing an attenuation of the effect when processing mode is controlled for (experiment 3). Finally, the last two studies leverage our processing mode account to document a reversal of classic construal-level findings in the consumer preference domain (experiments 4 and 5).

EXPERIMENT 1: EFFECTS OF PSYCHOLOGICAL DISTANCE ON VISUAL VERSUS VERBAL TASK PERFORMANCE

Experiment 1 was designed to examine our first premise: namely, that people are more likely to engage in visual (verbal) processing for psychologically proximal (distal) events.

Method

A total of 129 undergraduate students participated in the study for extra course credit. They were randomly assigned to one of the four experimental conditions, according to a 2 (temporal distance: proximal vs. distant) $\times$ 2 (task orientation: verbal vs. visual) between-subjects design. Participants were told that they would first complete a study to examine the writing skills of college students. On this pretense, and following a standard manipulation of temporal distance (Liberman et al. 2002), they were asked to write a short essay about "this weekend" in the temporally proximal condition or "a weekend in 2020" in the distant condition. Participants were then asked to complete a separate task. In the visual processing condition, participants were asked to solve a hidden figures puzzle that required them to locate small geometric figures that were embedded in a larger picture. In the verbal processing condition, they were asked to solve a hidden words task that required them to search for hidden words in a matrix of letters (Jiang, Steinhart, and Wyer 2008). Performance in these tasks, as measured by the number of correct solutions, served as the dependent variable. If, as we propose, the decreased (increased) psychological distance involved in the first task activates visual (verbal) processing, this should be reflected in the subsequent puzzle task: an active visual processing mode has been shown to enhance performance on the figure puzzle, whereas a verbal processing mode enhances performance on the word puzzle (Jiang et al. 2008). We predict, therefore, that participants in the proximal condition should perform better on the subsequent visual task but worse on the verbal task, as compared to those in the distant condition.

Results and Discussion

A 2 (temporal distance) × 2 (task orientation) analysis of variance (ANOVA) revealed a main effect of task orientation ($F(1, 125) = 91.61$, $p < .001$), showing that participants performed worse in the hidden words task ($M = 2.58$) than in the hidden figures task ($M = 6.02$). Central to our hypothesis, there was also a significant interaction effect between task orientation and temporal distance ($F(1, 125) = 11.23$, $p = .001$). Consistent with the prediction that proximal events are more likely to activate visual processing while distant events tend to activate verbal processing, planned contrasts revealed that participants in the temporally proximal condition performed better in the hidden figures task ($M_{proximal} = 6.68$ vs. $M_{distant} = 5.27$; $t(125) = 2.80$, $p < .01$) but worse in the hidden words task ($M_{proximal} = 2.09$ vs. $M_{distant} = 3.06$; $t(125) = -1.94$, $p = .06$), as compared to those in the temporally distant condition.

Using temporal distance to operationalize psychological distance, experiment 1 thus supports the proposition that psychologically proximal events are more likely to induce visual processing while psychologically distant events are more likely to induce verbal processing.

EXPERIMENT 2: THE MEDIATING ROLE OF PROCESSING MODE

The purpose of experiment 2 was to assess our hypothesis in full, that is, the differential tendency to engage in visual or verbal processing offers an explanation for the effect of psychological distance on construal level. Psychological distance was again manipulated via the temporal dimension, while construal level was measured using a standard categorization paradigm, described later. Finally, to examine the mediating role of processing mode, participants were asked to indicate the extent to which they engaged in visual processing in completing the task. We predicted that participants in the temporally proximal condition would be more likely to engage in visual processing (and by implication, less verbal processing) than those in the temporally distant condition, and this difference in processing mode would mediate the effect of temporal distance on construal level.

Method

A total of 67 Hong Kong undergraduate students participated in the study for extra course credit. All participants were told that the study was about planning leisure activities. On this pretense, they were asked to imagine that a friend would be visiting Hong Kong the next day (a year from now) in the temporally proximal (distal) condition. They were further told that this friend had never been to Hong Kong and had asked the participant to show her around some interesting places. Participants were then given a list of 40 tourist attractions in Hong Kong (e.g., Lan Kwai Fong, SoHo, Ocean Park) and asked to categorize them into groups. They were told that they could create as many categories as they want. This type of categorization task is an established measure of construal level (Liberman et al. 2002; Wakslak et al. 2006), such that a high (low) construal level produces fewer (more) categories.

After the categorization task, participants responded to two 7-point scales to capture the extent to which they engaged in visual processing: (1) "While responding to the scenario about your friend's visit, to what extent did any image come to your mind?" (1/7 = to a very small/great extent) and (2) "When responding to that scenario, I experienced few or no (1)/lots of images" (7). Note that while these items refer to visual processing, we follow past work in this area in assuming that greater visual processing is typically associated with less verbal processing, and vice versa (Childers et al. 1985; Wileman 1993). Thus visual and verbal processing have explicitly been described as being two "alternative strategies" (Wyer et al. 2008, 244): that is, the more an individual relies on one, the less likely that the other will be used.

Results and Discussion

Categorization. A one-way ANOVA on the number of categories created revealed that participants in the temporally proximal condition created more categories ($M = 5.59$) than those in the distant future condition ($M = 4.17$; $F(1, 65) = 10.43$, $p < .01$). Thus consistent with previous findings, those in the proximal condition engaged in lower-level construal than those in the distant condition (Liberman et al. 2002; Wakslak et al. 2006).

Processing Mode. A processing mode index was formed by averaging the two items measuring the extent of visual processing ($r = .81$). Supporting our theorizing, a one-way ANOVA revealed a significant effect of temporal distance such that participants in the proximal condition reported having engaged in a greater extent of visual processing ($M = 3.72$) as compared to those in the distant future condition ($M = 2.64$; $F(1, 65) = 128.37$, $p < .001$).

Mediation Analysis. We next conducted a mediation analysis using the process macro (Hayes 2013) to examine our hypothesis that the effect of psychological distance on construal level is in part driven by the amount of visual (vs. verbal) processing. First, as mentioned earlier, the direct effect of psychological distance on construal level, as measured by the number of categories created, was significant. In addition, the effect of psychological distance on processing mode was significant ($B = -1.08$, SE = $-.10$; $t(65) = -11.33$, $p < .001$). However, when both temporal distance and processing mode were included in the model, the direct path from temporal distance to construal level

disappeared ($B = .24$, SE $= .72$; $t(64) = .33$, $p = .74$) while the effect of processing mode was significant ($B = 1.54$, SE $= .54$; $t(64) = 2.82$, $p = .006$). Bootstrapping results involving generating 5000 resamples suggest that the indirect effect is significant with a 95% confidence interval (CI) excluding zero (-3.58 to $-.17$). Thus, as hypothesized, the effect of temporal distance on construal level was mediated by the extent to which participants engaged in visual versus verbal processing.

Alternative Mediation. An alternative explanation for these results is that psychological distance influences construal level, which in turns affects the amount of visual/verbal processing. This account indicates a different mediation process: The effect of psychological distance on amount of imagery is mediated by construal level. However, a test of this mediation model (again using the process macro) showed that our proposed model outperformed this alternative. Specifically, when both psychological distance and construal level were included in the model to predict amount of imagery, the direct effect of psychological distance on the amount of mental imagery remained significant ($B = -.98$, SE $= .10$; $t(64) = -10.02$, $p < .001$). In addition, the indirect effect of psychological distance on mental imagery (95% CI, $-.24$ to $-.02$) through construal level ($B = .10$, SE $= .05$, $p = .03$) is less significant than in the previous model. Thus mental imagery as the mediator of the distance-construal effect is a more accurate representation of the results, as compared to construal level mediating a distance-imagery effect.

Discussion. Experiment 2 replicated the experiment 1 result that people are more likely to engage in visual processing when the target event is temporally proximal than when it is distant. More importantly, experiment 2 built on that finding to show that this difference in the tendency to engage in visual versus verbal processing mediated the effect of temporal distance on construal level, as measured using a standard categorization task. Together, these findings support our hypothesis that the influence of psychological distance on construal level is at least partly driven by distance-induced shifts in processing mode.

The next study provides further support for this hypothesis using a different, moderator-based approach. Psychological distance and processing mode were varied orthogonally, and their respective effects on construal level observed. If processing mode indeed underlies the effect of psychological distance on construal level (as we argue), we should still observe an effect of processing mode on construal level regardless of psychological distance. In contrast, the effect of psychological distance on construal level should be attenuated at both high levels of visualizing and high levels of verbalizing. Such evidence would provide further support for the key intervening role of processing mode. Further, it would successfully establish boundary conditions for the robust distance-construal effect.

EXPERIMENT 3: PRIMED PROCESSING MODE AND SOCIAL DISTANCE

Experiment 3 tested our predictions by simultaneously manipulating social distance and also processing mode. Construal level was then assessed using the Behavioral Identification Form (BIF; Vallacher and Wegner 1989). The goal of this study was to show that the usual CLT effect—socially distant (vs. proximal) targets being construed at a more abstract level—will not hold when processing mode is manipulated independently of social distance. Instead, we should observe a main effect of processing mode such that the construal level is lower in the visualizing condition than the verbalizing condition.

Method

Participants and Design. We employed a 2 (social distance: proximal vs. distant) $\times$ 2 (processing mode: visual vs. verbal) between-subjects design. In addition, we included two control conditions where we only manipulated social distance (socially proximal vs. distant) without manipulating processing mode. These control conditions were included in order to replicate the classic effect of psychological distance on construal level when processing mode is *not* separately manipulated. Such a demonstration would help to rule out the possibility that the predicted lack of the distance-construal effect of the experimental conditions is simply due to the particular stimuli and procedures being employed. Thus the study had a total of six between-subjects conditions. A total of 193 undergraduate students at Hong Kong University of Science and Technology participated in the study for extra course credit.

Materials and Procedure. The experiment was divided into two ostensibly unrelated studies. First, participants in the experimental conditions were either asked to solve the hidden figures puzzle task or the hidden words puzzle task used in experiment 1. Prior research has shown that completing the former (latter) task increases the accessibility of visual (verbal) processing, which then becomes the dominant processing mode for immediately subsequent tasks (Jiang et al. 2008). Participants in the two control conditions did not complete this task. Next, all participants were asked to complete an ostensibly unrelated survey on understanding the behaviors of others. They were told that they would see a list of behaviors performed by a target person, who was described as being similar (socially proximal) or dissimilar (socially distant) to the participants. In the socially proximal condition, the target person was described as being an undergraduate student from the same demographic background (Chris Chan, age 20), with the same major (marketing) and similar interests (movies, Karaoke, and hiking) as our participants. In the socially distant condition, the target person was described as having a different

demographic (Chris Smith, age 40) and educational background (PhD in chemistry), as well as different interests (fishing, skiing, and hunting) from those of our participants.

Following this social distance manipulation, all participants were exposed to a list of 25 behaviors supposedly performed by the target person; these behaviors were all taken from the BIF. Each behavior (e.g., ringing a doorbell) was accompanied with two ways of describing it, one corresponding to a high-level representation focusing on the "why" of the behavior (e.g., seeing if someone is home), the other corresponding to a low-level representation focusing on the "how" of the behavior (e.g., moving your finger). This measure has been used to verify the usual effect of psychological distance on construal levels in the context of social distance, with people tending to identify similar others' behaviors at lower levels while identify dissimilar others' behaviors at higher levels (Liviatan et al. 2008). We expected to replicate this finding in the control conditions, but not in the experimental conditions where processing mode was independently manipulated.

Finally, as a manipulation check for processing mode, we asked participants to indicate the extent to which they formed visual images of the target person and behaviors (1 = Very little; 7 = A lot). In addition, to assess the social distance manipulation, participants were asked to rate their similarity to the target person (1 = Not at all; 7 = Very similar), how well they thought they know the target (1 = Not at all; 7 = Very well), and how close they felt to the target (1 = Not at all; 7 = Very close). These three items were averaged to form an index of perceived distance ($\alpha = .70$).

Results and Discussion

Manipulation Checks. First, a 2 (social distance) × 2 (processing mode) ANOVA examining the experimental conditions only revealed an effect of the social distance manipulation ($F(1, 125) = 27.95$, $p < .001$) on perceived distance. As expected, participants in the socially proximal condition ($M = 3.75$) perceived the target person as closer to them than those in the socially distant condition ($M = 2.98$), with higher scores indicating shorter distance. No other effects reached significance (F's < 1). The same pattern was found in the control conditions as well ($M_{\text{proximal}} = 3.63$ vs. $M_{\text{distant}} = 2.72$; $F(1, 62) = 23.68$, $p < .001$). Taken together, these results suggest that our manipulation of social distance worked as intended.

In addition, we checked our manipulation of processing mode in the experimental conditions (participants in the control condition were not exposed to this manipulation). The results of a 2 (social distance) × 2 (processing mode) ANOVA on the extent of visual imagery formed about the target person yielded only a main effect of processing mode priming ($F(1, 125) = 22.75$, $p < .001$), with participants in the visualizing condition indicating that they formed a greater degree of visual imagery than those in the verbalizing condition ($M_{\text{visualizing}} = 3.97$ vs. $M_{\text{verbalizing}} = 3.03$). Thus the processing mode manipulation was also effective.

Hypothesis Testing: The Effect of Social Distance on Construal Level. Each participant's score on the behavioral identification task was calculated as a measure of construal level (BIF score), with higher BIF scores indicating a higher construal level (Vallacher and Wegner 1989). We first examined whether the classic effect of psychological distance on construal level was replicated with our stimulus set. An analysis of the control conditions showed that, consistent with past findings in the construal-level literature (Liviatan et al. 2008), participants identified the behaviors performed by the socially proximal target at a lower level ($M = 14.77$) than behaviors performed by the socially distant target ($M = 16.59$; $F(1, 62) = 3.69$, $p = .06$). Further, we found that, conceptually replicating our results from experiment 2, this effect of social distance on action identification was mediated by the amount of visual processing participants engaged in. Participants in the socially proximal condition engaged in more visual processing ($M_{\text{proximal}} = 3.63$) than those in the socially distant condition ($M_{\text{distant}} = 2.97$; $F(1, 62) = 4.11$, $p < .05$). When both social distance and processing mode were both included in the regression model to predict BIF, the effect of social distance disappeared ($B = .62$, SE $= .77$; $t(61) < 1$, $p = .42$) while the effect of processing mode was significant ($B = -1.80$, SE $= .29$; $t(61) = -6.23$, $p < .001$). The results of bootstrapping involving generating 5000 resamples indicated that the mediation was significant, with 95% CI excluding zero (0.10–2.52).

While we had expected to replicate the classic effect of psychological distance on construal levels in the control conditions (where we did not manipulate processing mode), we expected a different pattern in the experimental conditions, in which processing mode was manipulated independent of distance. Based on our theorizing, we anticipated that when visual (verbal) processing is activated, participants would tend toward low- (high-) level

TABLE 1.

EXPERIMENT 3: EXTENT OF VISUAL IMAGERY AND LEVEL OF CONSTRUAL (MEASURED BY BIF SCORE) AS A FUNCTION OF PROCESSING MODE AND SOCIAL DISTANCE

	DV = Visual imagery		DV = BIF	
	Social distance		*Social distance*	
Processing mode	Close	Distant	Close	Distant
Control	3.63 (1.11)	2.97 (0.98)	14.77 (3.84)	16.59 (3.66)
Verbal	3.16 (1.04)	2.86 (0.83)	15.95 (3.02)	16.79 (4.22)
Visual	4.10 (1.22)	3.84 (1.37)	14.52 (3.46)	14.94 (4.67)

construals, regardless of social distance. This prediction was examined in the context of a 2 (social distance) × 2 (processing mode) ANOVA on the BIF scores. In contrast to the control conditions, but in line with our hypothesis, there was no longer any effect of social distance on construal level ($M_{proximal} = 15.29$ vs. $M_{distant} = 15.82$; $t < 1$, $p > .30$). This was true in both the visualizing ($M_{proximal} = 14.52$ vs. $M_{distant} = 14.94$; $t < 1$, $p > .60$) and the verbalizing conditions ($M_{proximal} = 15.95$ vs. $M_{distant} = 16.79$; $t < 1$, $p > .30$). Instead, as we predicted, there was a significant effect of primed processing mode on BIF scores ($F(1, 125) = 5.79$, $p = .02$) such that participants in the verbalizing condition ($M = 16.32$) had higher construal levels than those in the visualizing condition ($M = 14.73$). Furthermore, processing mode did not interact with the social distance manipulation ($F < 1$, $p > .50$), showing that the effect of processing mode on construal level held for both proximal (M's = 15.95 vs. 14.52; $p = .13$) and distant (M's = 16.79 vs. 14.94; $p = .06$) targets.

Discussion. By manipulating processing mode independently of psychological distance, experiment 3 provides further evidence for its intervening role in accounting for the influence of psychological distance on construal level. We found that when psychological distance and processing mode were manipulated orthogonally, the usual effect of psychological distance was replaced by an effect of processing mode such that priming visual (verbal) processing decreased (increased) construal level. It merits mention that we replicated these findings in another study (details available with the authors). The replication used a different processing mode manipulation (via task-related instructions), a different dimension of psychological distance (temporal distance), and a different measure of construal level. Again, processing mode was found to influence construal level, whereas psychological distance did not.

Together, these results suggest that, consistent with our theorizing, the effect of psychological distance on construal level is indeed driven in large part by processing mode. Of importance, by showing that the distance-construal effect disappeared given a predominantly visual or predominantly verbal mode of processing, experiment 3 was able to successfully identify boundary conditions for the effect. It is also noteworthy that the classic distance-construal relationship was replicated in the control conditions, in which processing mode was not separately manipulated. This rules out the possibility that the absence of the distance-construal effect in the experimental conditions is due to any stimulus-based artifact, since the control conditions used the same stimuli. Finally, the mediating influence of processing mode observed in the control conditions was also consistent with our view regarding the intervening role of processing mode in explaining the effect of psychological distance on construal level.

This experiment identifies a novel implication of the current theoretical formulation that seeks to unpack the distance-construal association: namely, it specifies boundary conditions for the usual effect of psychological distance on construal level. The final two studies now assess another novel implication of our formulation, by showing how it enables a reversal of classic findings arising from CLT. We focus on the desirability-feasibility effect, which holds that people attach relatively greater weight to desirability (feasibility) considerations in the context of distal (proximal) decisions. Much extant research supports this premise (Irmak et al. 2013; Liberman and Trope 1998). As explained earlier, however, our unpacked formulation, with its emphasis on the intervening role of processing mode, suggests that this effect will be reversed in the special case when desirability (feasibility) considerations are relatively easy to visualize (verbalize).

In comparing the current predictions with extant research, it is important to note that past work has never, to our knowledge, sought to manipulate the degree of visualizability of the desirability-feasibility dimension. Instead, the two have typically been conflated, with the more feasible (desirable) attribute also likely being easier (harder) to visualize. Thus, in the classic study by Liberman and Trope (1998), the desirability dimension related to the interest value of a lecture, while feasibility related to its timing. It seems probable that the latter is easier to visualize than the former; at the very least, it is hard to argue the reverse. Similarly, in another study documenting the effect, Irmak et al. (2013) examined participants' evaluations of a subscription plan for a news Web site. Here, desirability was operationalized in terms of the content of the site matching participants' professional interests, while feasibility was operationalized in terms of quick download speed and clear design that would enable users to easily locate the target information. Again, it seems intuitively likely that the feasibility feature was easier to visualize than the desirability feature.

In such cases, both the black box view of CLT (which is only concerned with the direct association between distance and construal rather than with intervening variables) and the current unpacked formulation (highlighting the intervening role of processing mode) would arrive at the usual prediction: greater weight attached to the desirability (feasibility) aspect for distal (proximal) decisions. It is only when this contingency is reversed, and desirability is made more visualizable than feasibility, should the reversal predicted by our formulation obtain.

To provide a complete test of these ideas, experiment 4 examined preferences in the context of two different choice sets: one in which the desirability-related attribute was manipulated as being less visualizable than the feasibility-related attribute (the usual CLT effect was expected), and the other in which the desirability-related attribute was manipulated as being more visualizable than the feasibility-

related attribute (a reversal was expected). Experiment 5 then examined a corollary argument in the context of another decision type, one that involved trade-offs between payoffs and probabilities (Sagristano et al. 2002).

EXPERIMENT 4: REVISITING DESIRABILITY VERSUS FEASIBILITY

Method

Participants and Design. A total of 341 Mechanical Turk (MTurk) participants (171 females; $M_{age} = 35.74$, SD = 10.93) took part in this study in exchange for a small monetary reward. They were randomly assigned to conditions using a 2 (temporal distance: near vs. distant) × 2 (nonvisualizable-desirability choice set vs. visualizable-desirability choice set) between-subjects design. Note that although for ease of exposition, we refer to "nonvisualizable" and "visualizable," these are comparative terms simply indicating that in the first (second) choice set, the desirability aspect is less (more) visualizable than the feasibility aspect.

Procedure and Pretest. Participants either imagined booking a hotel for an upcoming trip next week or a year later. All participants then indicated their preference between two hotels, for one of two choice sets. In the nonvisualizable-desirability choice set (choice set 1), one hotel was described as having "excellent service but requires filling in very long forms when booking," whereas the other hotel had "average service but customers only need to fill in a very short form when booking." In the visualizable-desirability choice set (choice set 2), one hotel was described as having "an excellent view but the cancellation policy is very strict," whereas the other hotel had "an average view but customers can easily cancel their booking."

Care was taken to ensure that these manipulations of desirability/feasibility and relative visualizability of each attribute were consistent with our goals. In a pretest, 36 MTurk participants (21 females; $M_{age} = 40.58$, SD = 14.93) were asked to assess these attributes along two dimensions: ease of visualizability (i.e., how easy it was to picture that attribute mentally) and the extent to which the attribute reflected desirability or feasibility. Following the literature, we told participants that desirability referred to how positive the end state was, whereas feasibility referred to how pragmatic the means of getting to the end state were (Irmak et al. 2013). After reading the instructions, participants provided their ratings on these two dimensions for each of the following four attributes: hotel view, service quality, the length of reservation form, and the strictness of cancellation policy. Each of the two dimensions used a 7 point scale (scale 1: 1 = Not very easily pictured or visualized/7 = Very easily pictured or visualized; scale 2: 1 = Feasibility/7= Desirability).

The design of the main study assumes the following: for choice set 1, service quality is harder to visualize than length of cancellation form; at the same time, the former is higher on desirability (and lower on feasibility) than the latter. This would yield the required case of desirability being less visualizable than feasibility. For choice set 2, the hotel view should be easier to visualize than the strictness of the cancellation policy, but the former should also be rated higher on desirability (and lower on feasibility) than the latter. This would yield the required case of desirability being more visualizable than feasibility.

The results of a series of paired and one-sample *t* tests showed that these attributes were indeed perceived in the manner intended. Thus, with regard to choice set 1, participants rated service quality as less visualizable ($M = 4.36$, SD = 1.81) than the length of reservation form ($M = 5.50$, SD = 1.48; $t(35) = 3.06$, $p = .004$), with the former rated higher on the desirability dimension than the latter ($M = 5.11$, SD = 1.85 vs. $M = 3.14$, SD = 1.71; $t(35) = 4.16$, $p < .001$). For choice set 2, again as intended, participants not only rated hotel view as more visualizable ($M = 6.06$, SD = .98) than the strictness of cancellation policy ($M = 4.11$, SD = 1.82; $t(35) = 5.88$, $p < .001$), but they also rated it higher on the desirability dimension than the latter ($M = 6.08$, SD = .97 vs. $M = 3.17$, SD = 1.67; $t(35) = 7.92$, $p < .001$).

Results and Discussion

Hypotheses Tests. Our predictions were examined via a logistic regression that used temporal distance (0 = Near, 1 = Distant), visualizability (0 = Nonvisualizable desirability, 1 = Visualizable desirability) and their interaction to predict the choice share of the option with high desirability but low feasibility (hereafter "desirable option"). This analysis revealed two significant effects. First, consistent with classic CLT findings, the main effect of temporal distance was positive and significant ($\beta = 2.19$, SE = .78, Wald = 7.86, $p = .005$), indicating that the choice share of the desirable option increased with temporal distance. As we predicted however, this main effect was qualified by an interaction with visualizability ($\beta = -1.39$, SE = .47, Wald = 8.78, $p = .003$). Planned contrasts then revealed that in choice set 1, where the desirability-related attribute was less visualizable than the feasibility-related attribute, we replicated CLT findings. That is, the choice share of the desirable option was higher in the distant (77.78%) than in the near condition (61.11%; $\beta = .80$, SE = .36, Wald = 4.94, $p = .03$). Importantly, however, in choice set 2, where the desirability attribute was more visualizable than the feasibility attribute, this effect was reversed. Here, consistent with our processing mode–based conceptualization, temporal distance actually *decreased* participants' preference for the desirable option ($M_{close} = 50.52\%$ vs. $M_{distant} = 36.26\%$; $\beta = -.58$, SE = .30, Wald = 3.85, $p = .05$).

Experiment 4 was thus successful in both replicating and reversing an important result obtaining from CLT. When the choice set featured stimuli similar to those used in past research (with the desirability attribute being less visualizable than the feasibility attribute), CLT findings were replicated. However, when the direction of visualizability was reversed, so was the effect. This finding illustrates the utility of the current theoretical formulation that highlights the intervening role of processing mode as opposed to a direct "black box" view of the distance-construal association. The preference reversal obtained in experiment 4 follows in a straightforward manner from the former, but not from the latter.

EXPERIMENT 5: PROBABILITY VERSUS PAYOFF

To the best of our knowledge, experiment 4 represents the first time that a reversal of a classic CLT finding has been demonstrated. Although it is consistent with our theorizing, such a finding is rare enough to warrant replication. Experiment 5 sought to do so while at the same time generalizing our reasoning to a different context. This last study tested whether the processing mode perspective can reverse another finding that is derived from the desirability-feasibility framework: the trade-off between payoffs and probability. In particular, for uncertain prospects (e.g., a lottery), temporal distance has been shown to increase the influence of the lottery payoff value (a desirability-like dimension) while decreasing the impact of winning probability (a feasibility-like dimension; Sagristano et al. (2002).

Drawing on the same reasoning as in experiment 4, however, we argue that such results are particularly likely to hold if the probability information (which is akin to feasibility) is relatively visualizable, while the payoff information (akin to desirability) is relatively hard to visualize. As our conceptualization of psychological distance argues, visualizable aspects are more influential for proximal versus distal decisions because proximity induces visual processing. As before, this rationale also suggests when a reversal should be expected: namely, if the probability figure is presented in a manner that is relatively hard to visualize and the lottery payoff is made relatively easy to visualize. Experiment 5 tests this prediction. Note that again, a black box account of the distance-construal effect would not be so easily able to predict such a reversal, since it simply argues that the feasibility-related attribute (winning probability) should in general be more influential for proximal decisions, while the desirability-related attribute (payoff) should become less influential for proximal versus distal decisions.

Method

Participants and Design. Participants were 288 undergraduate students (114 females; $M_{age} = 22.93$, SD = 5.71) at a North American university who completed a 30 minute study session for course credit. They were randomly assigned to conditions using a 2 (social distance: close vs. distant) × 2 (choice Set 1: visualizable probability and nonvisualizable payoff vs. choice set 2: nonvisualizable probability and visualizable payoff) between-subjects design.

Procedure. Participants imagined a socially proximal (distant) person choosing between two lottery tickets. The socially proximal condition featured a marketing undergraduate student with a common Hispanic name, Julio (the city where our study was conducted has a large Hispanic population). By contrast, the socially distant person was described as a Chinese (name: Chang) engineer living in a distant city, Seattle. We also needed to manipulate the visualizability of both probabilities and payoffs to create our choice sets. The visualizability of probabilities was manipulated by providing the figure in terms of either frequency (e.g., 10/1000) or permille (e.g., 10‰ – i.e., per thousand). Past research has shown that compared to percentage framing, which is similar to permille framing, a frequency frame is more likely to trigger mental imagery (Slovic, Monahan, and MacGregor 2000). Interestingly, and consistent with our premise that the classic CLT finding is more likely to obtain when the feasibility attribute is made relatively visualizable, the probability figure in the Sagristano et al. (2002) studies was always presented in terms of a frequency estimate (e.g., drawing from 100 marbles) rather than a percentage (e.g., 10%).

The visualizability of payoffs was manipulated via the extent to which vivid information was provided about the payoff (Kisielius and Sternthal 1986). Thus choice set 1, featuring visualizable winning probabilities and nonvisualizable payoffs, asked participants to choose between two lotteries: lottery A (B) was described as having 1 of 1000 (10 of 1000) probability of winning a product worth $500 ($50). Choice set 2, which featured nonvisualizable probabilities and visualizable payoffs, described the following two lotteries: lottery A (B) had 1‰ (10‰) probability of winning a free night at a five star luxury hotel worth $500 (a free night at an economy inn worth $50). Participants in all conditions were asked to indicate which lottery the target person was more likely to choose. Finally, we asked participants to rate how close they felt to the target person (1 = Not at all; 7 = Very close).

A pretest, reported in the appendix, confirmed the assumption that using the stimuli just described, the probability information was more (less) visualizable than the payoff information in choice set 1 (choice set 2).

Results and Discussion

Manipulation Check. The results of a 2 (social distance) × 2 (direction of visualizability) ANOVA on perceived social distance only revealed the intended effect of the former ($F(1, 284) = 22.34$, $p < .001$). Participants in

the proximal condition ($M = 3.34$, SD = 1.87) indicated that they felt closer to the target person than those in the distant condition ($M = 2.35$, SD = 1.67).

Hypotheses Tests. Our hypotheses were examined via a logistic regression that used social distance (0 = Close, 1 = Distant), visualizability (0 = Nonvisualizable payoff, 1 = Visualizable payoff), and their interaction, to predict the choice share of the option featuring high payoff but low probability. Note that increased preference for this option reflects a relatively greater (lower) influence of payoffs (probability); thus the CLT-based prediction argues for a greater choice share of this option in the distal versus proximal conditions.

All three terms in the regression model were significant. The effect of visualizability was positive ($\beta = 2.02$, SE = .76; Wald = 7.10, $p = .008$), implying that participants are more likely to select the high payoff option when payoff information was more visualizable. While this effect is not relevant to the predictions, we speculate that it obtained due to a relatively high propensity for participants to use a visual processing strategy. Second, a positive effect was obtained for social distance ($\beta = 1.80$, SE = .76; Wald = 5.66, $p = .02$), indicating that participants' tendency to choose the high payoff (and low probability) option increases with social distance.

Of importance, this main effect of social distance was qualified by its interaction with visualizability ($\beta = -1.23$, SE = .48; Wald = 6.66, $p = .01$). When payoff information was less visualizable than probability information, findings were consistent with the CLT-based effect obtained by Sagristano et al. (2002): choice share of the high payoff option was lower in the close condition (40.85%) relative to the distant condition, at a marginal level of significance (54.93%; $\beta = .57$, SE = .34; Wald = 2.80, $p < .10$). As predicted, however, a reversal was observed when the payoff information was more visualizable than the probability information: compared to those in the distant condition (43.84%), participants in the close condition (60.27%; $\beta = -.66$, SE = .34; Wald = 3.92, $p = .05$) were more likely to choose the high payoff option.

Experiment 5 thus provided another demonstration of how the current conceptualization, which highlights the intervening role of processing mode to explain the distance-construal association, can yield novel implications. Building on the desirability-feasibility trade-off examined in experiment 4, this study examined a related type of decision trade-off, that between probability and payoff. The findings were similar to those obtained in experiment 4. When probability information was more visualizable than payoff information, preferences followed the pattern suggested by extant CLT research. However, a reversal was obtained when the payoff information was made more visualizable, and the probability information less so.

GENERAL DISCUSSION

CLT has been one of the most fruitful conceptual formulations of the last 20 years in the realm of both social psychology and consumer research. The extant literature on CLT has adopted what might interchangeably be termed (depending on one's metaphor preference) a bird's-eye view/a high-level construal/a black box perspective, focusing on the basic premise that a link exists between psychological distance and construal link, and exploring the consequences of this association. By laying this foundational stone of the distance-construal association in place, CLT-related research has been able to show that psychological distance, by changing construal level, influences outcomes such as preference and choice (Liberman and Trope 1998), emotional reactions (Hong and Lee 2010), persuasion (Kim et al. 2009a), negotiation (Henderson, Trope, and Carnevale 2006b), metacognition (Tsai and Thomas 2011), self-control (Fujita et al. 2006b), and memory (Kim, Park, and Wyer 2009b).

Without questioning the undoubted value of this perspective, the current research takes a complementary approach by focusing the lens more closely on the distance-construal association itself, in a bid to uncover intervening variables that might play a role. Drawing on a diverse set of literature, we propose one such intervening variable: processing mode. Thus psychological distance is posited to shift people's processing mode such that they are more likely to engage in visual (verbal) processing for psychologically proximal (distant) events, and this in turn changes the level at which they construe that event.

While this conceptualization in no way contradicts the current CLT perspective, simply specifying an intervening variable allows us to make three contributions. First, a theoretical contribution lies in obtaining more detailed, fine-grained insight into the mechanism by which psychological distance influences construal level. Consistent with this mechanism, we found that participants asked to think about a psychologically proximal (vs. distant) event in an initial task performed better in a subsequent task that required visual processing but worse in a task requiring verbal processing (experiment 1). Further, participants not only reported a greater degree of visual processing for proximal (vs. distant) events, but importantly, the degree to which they engaged in visual versus verbal processing mediated the effect of psychological distance on construal level (experiment 2).

A second contribution of this intervening-variable approach lies in its ability to identify boundary conditions for the hitherto robust influence of psychological distance on construal level. Following from the proposition that processing mode is a key mediator of the distance-construal effect, we find that the effect gets substantially attenuated when participants are engaged in either predominantly visual or predominantly verbal processing. The former induces low-level and the latter induces high-level construals,

regardless of psychological distance (experiment 3). Thus the effect of distance on construal levels, even though it is a very robust one, does not seem hardwired; rather, it is susceptible to attenuation. Importantly, the identification of these theoretically derived boundary conditions provides further support for the intervening role of processing mode highlighted in our conceptualization.

Third, unpacking the distance-construal association also allows us to identify when and why classic consequences of psychological distance itself might actually be reversed. We examine such reversals in the context of two related forms of preference trade-offs: desirability versus feasibility (experiment 4) and payoff versus probability (experiment 5). Extant perspectives on CLT argue that desirability/payoff considerations exert more influence for distal decisions, whereas feasibility/probability considerations are more likely to dictate proximal preferences. The current theorizing, in contrast, argues that while this pattern should indeed obtain when feasibility/probability aspects are more visualizable than desirability/payoff aspects, a reversal should obtain when the visualizability inequality holds in the other direction. Findings from the two corresponding studies provide support for these predictions, thus documenting what we believe is the first instance of these well-known effects of psychological distance being reversed.

Finally, it is worth noting that our work, while suggesting that the current results (as well as potentially some previous findings in the CLT literature) can be viewed through the prism of processing mode, does not question the value of the mental construal construct. In our view, processing mode (visual/verbal processing) and construal level (concrete/abstract construal) should be seen as distinct constructs. As an illustration, the items used in the BIF inventory—a standard measure of abstract/concrete construal that has been used in past CLT research (Liviatan et al. 2008; Trope and Liberman 2010) as well as the current work—clearly capture the level of mental construal rather than verbal/visual processing. Consider, for instance, the BIF item "caring for houseplants," for which participants are asked to choose between the descriptors of "watering plants" versus "making the room look nice." While the former is an instance of low-level concrete processing and the latter describes high-level abstract processing, both are highly visualizable, supporting the premise that processing mode and construal level are different constructs. We have also obtained empirical evidence for this distinction in an additional study (not reported in this article for reasons of space), which found that an antecedent factor, namely, ego depletion, has divergent effects on processing mode and construal level. Consistent with the finding that because depletion increases focus on resource availability, it should yield lower-level construal (Wan and Agrawal 2011), depleted participants in the study scored lower on the BIF compared to control participants. At the same time, and following past research on resource reduction (McGill and Anand 1989), depleted participants engaged in less visual processing than control participants.[1] Thus both conceptual and empirical evidence argues against an interchangeable use of processing mode and construal level. Rather, as the current work suggests, processing mode can be viewed as playing an intermediary role in driving the effect of psychological distance on construal level.

Related Research

It is instructive to compare the current work with two recent investigations. Amit et al. (2009) find that psychological proximal (distal) objects are processed more quickly when they are presented pictorially (verbally). As described earlier, we draw on this finding in support of the first link of our theorizing (namely the link between distance and processing mode). At the same time, our research goes beyond Amit et al. (2009) in crucial ways. First, while their results are consistent with the first strand of our conceptualization, that research does not get into the second strand, the link from processing mode to construal level. Thus their article, unlike ours, does not represent an attempt to unpack the entire mechanism underlying the effect of psychological distance on construal level. Second, while the current work draws on this unpacked mechanism to both identify boundary conditions for the distance-construal effect (experiment 3), and to document reversals of CLT-based predictions (experiments 4 and 5), Amit et al. (2009) do not examine either of these issues (which is natural, given that their focus was not on providing insights into the mechanism underlying the distance-construal effect).

Another stream of research (Liberman and Förster 2009a, 2009b) has found evidence of a bidirectional association between near (far) distances on the one hand and local (global) processing on the other, as measured in the relative ability to identify local versus global letters in the classic Navon letter-identification task. The broad similarity with our work is that those scholars have also shown that psychological distance can affect a form of processing—in their case, local versus global processing. At the same time, there are once again important differences. First, the two different dimensions of processing mode (visual/verbal vs. global/local) seem mutually orthogonal. Thus, for instance, as Liberman and Förster (2009a) explain, a tendency to see the big picture "forest" is indicative of global processing while a tendency to see the details (the "trees") is indicative of local processing. However, visual processing is clearly implicated in both. Further, our own work in this area also offers empirical support for such orthogonality. A study carried out in our lab (details available with the authors) manipulated visual versus

[1] Note that these findings remain consistent with our research, in that even though lower visual processing should induce a tendency toward higher-level construal, this is likely overwhelmed by the direct effect of depletion, which forces lower-level construals overall.

verbal processing mode, before administering the Navon letter-identification task. Processing mode was found to exert no influence on the tendency to identify global versus local letters, suggesting that visual/verbal processing identifies a distinction that is different from global/local processing. The two conceptualizations of the effects of psychological distance thus offer independent complementary insights. Finally, following from the notion of complementary insights, it is also worth noting that the Liberman and Förster (2009a, 2009b) inquiries, as with the Amit et al. (2009) research, do not explain the novel implications uncovered by the present work, whether in terms of identifying boundary conditions for the distance-construal effect or documenting reversals of classic findings following from the CLT perspective.

Closing Comments

While the primary contribution of this research lies in relation to CLT, it also makes a secondary contribution to extant literature on visual imagery by identifying a new antecedent as well as a new consequence of visual versus verbal processing. On the antecedents front, we add to prior research by showing that, apart from variables such as individual differences, priming, and task factors (Wyer et al. 2008 offers a review), psychological distance can also influence processing mode. From a consequence perspective, past work has already examined the impact of visual versus verbal processing modes in various marketing domains such as new product design (Dahl, Chattopadhyay, and Gorn 1999) and product evaluation and preference (Keller and McGill 1994; Petrova and Cialdini 2005). By showing that processing mode directly influences construal level, and given the rich body of work that finds construal level can systematically influence consumers' attitudes and decision making (Trope et al. 2007), our results suggest that processing mode might have even more broad-ranging consequences on consumer preferences than previously assumed.

This research also opens up several potential lines of investigation. First, scholars might wish to examine other ramifications of our finding that psychological distance influences processing mode. One interesting possibility lies in the domain of self-control. In particular, one reason that self-control is harder to exert given the physical presence of the tempting object (e.g., a delicious cake; Fedorikhin and Patrick 2010) could be that the reduced spatial distance, by activating visual processing, increases the influence of the visually tempting features of the cake. Interestingly, this line of thought also suggests how self-control can be enhanced, even when the tempting object is physically proximal. Rather than focusing on less vivid health-related benefits (e.g., lower cholesterol), preventive messages should focus on the visualizable benefits of exerting self-control (such as a better physical appearance). These are the benefits that are likely to carry greater weight when the self-control decision is psychologically nigh. Second, while the current research has shown that reduced psychological distance invokes one form of imagery-based processing (visual), future work should consider the possibility that similar effects obtain for other types of imagery-based sensory processing (e.g., olfactory and auditory processes).

Finally, and of most importance, future research should seek to identify other possible routes by which psychological distance influences construal level. While the current set of studies obtains good support for the intervening role of processing mode, we are very open to the possibility that this is just one of several possible (and simultaneous) mechanisms. Further work along these lines, by articulating underlying processes as well as boundary conditions, has the potential to enhance our understanding of one of the richest theories that have informed social psychology and consumer research in recent times.

DATA COLLECTION INFORMATION

The first author collected data for experiments 1 through 3 with the help of a research assistant at the Hong Kong University of Science and Technology behavioral lab between 2011 and 2012. The first author conducted experiment 4 on Amazon's MTurk in October 2015. The first author supervised the collection of data for experiment 5 by research assistants at the University of Texas at San Antonio behavioral lab in November 2015. The data for all five experiments were analyzed by the first author.

APPENDIX: EXPERIMENT 5 PRETEST

In this study, 221 MTurk participants (113 women, mean age = 35.73, SD = 11.87) were randomly assigned to one of eight cells, and asked how easy it was to picture in their minds one of the eight types of information used in the main study: 1 of 1000, 10 of 1000, 1‰, 10‰, a product worth $50, a product worth $500, a free night at a five star luxury hotel worth $500, or a free night at an economy inn worth $50. Visualizability ratings were collected on a 7 point scale (1 = Not easy at all; 7 = Very easy). Initial analyses showed that there was no difference in visualizability of each specific type of information. Specifically, the two different probabilities presented as frequencies did not vary in visualizability ($M_{1\text{ of }1000} = 5.46$ vs. $M_{10\text{ of }1000} = 5.12$; $t(213) < 1$), nor did the two probabilities presented as permille ($M_{1‰} = 4.00$ vs. $M_{10‰} = 4.13$; $t(213) < 1$). Similarly, the two payoffs presented in terms of a simple product price did not differ in visualizability ($M = 4.71$ vs. 4.71; $t(213) < 1$); nor did the two payoffs presented in terms of the more vivid hotel room information ($M = 5.21$ vs. 5.48; $t(213) < 1$). In each of these cases, therefore, an average visualizability score was created by pooling across

the two individual means scores. These pooled averages were then used to assess the manipulations. As intended, we found that probability information framed in terms of frequency ($M = 5.29$, $SD = 1.43$) was more visualizable than payoff information framed as a product price ($M = 4.71$, $SD = 1.86$; $t(217) = 1.88$, $p = .06$). In contrast but also as intended, probability framed as a permille ($M = 4.05$, $SD = 1.88$) was rated less visualizable than payoff information framed in terms of a stay at a hotel ($M = 5.33$, $SD = 1.62$; $t(217) = 3.85$, $p < .001$).

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