Journal of Experimental Psychology: General
2013, Vol. 142, No. 3, 644–657

0096-3445/13/$12.00 DOI: 10.1037/a0030258

Distance From a Distance: Psychological Distance Reduces Sensitivity to Any Further Psychological Distance

Sam J. Maglio
University of Toronto

Yaacov Trope
New York University

Nira Liberman
Tel Aviv University

What is the difference between *far* and *further*? Investigations into such psychological distancing—removal from an egocentric reference point—have suggested similarities between geographical space, time, probability, and social distance. We draw on these similarities to propose that experiencing any kind of distance will reduce sensitivity to any other distance. Nine studies varied the initial distance of an event and assessed sensitivity to a second distance. Consistently, people were less responsive to a given span of distance when it was distal versus proximal. This effect held using each of the four distances as the initial instantiation of distance; it also held using each dimension to assess sensitivity to distance (i.e., as the second distance dimension). These findings suggest that the dimensions of psychological distance share a common, interchangeable meaning and that the cross-dimension difference between far and further is less than that between near and far.

Keywords: psychological distance, discounting, valuation, judgment, decision making

After years of dating, a couple from upstate New York gets engaged. He writes his vows, she finds a dress, they schedule their respective bachelor and bachelorette parties. But, being young and on a budget, they face tough choices: When they send out reminders to save the date, who among their family and friends will be just too socially removed from them to be invited? In the midst of this dilemma, they narrow down their potential wedding venues to two options: the bride's parents' backyard, blocks away from their own apartment in Syracuse, or the groom's grandparents' ranch, perched above the ocean in sunny San Diego. Will their choice of *where* to tie the knot influence their decision of *who* is deemed close enough to bear witness?

In the present investigation, we propose that a distal, San Diego-based invite roster would prove more challenging for the lovebirds to prune. More broadly, and beyond just geographical space (i.e., the physical distance from New York to California), we hypothesize that an initial instantiation of *psychological distance* will cause a generalized reduction in sensitivity to subsequent instantiations of distance. Importantly, such distances can take one of four forms: space; time; probability; and, in the case of our example, social distance (Liberman, Trope, & Stephan, 2007). To develop our hypothesis, we draw upon the extant literature related to the subadditivity (e.g., Green & Myerson, 2004) and interchangeability (Liberman, Trope, & Stephan, 2007; Trope & Liberman, 2010) of these distances. Integrating these two perspectives, we predict that cross-dimension distancing (e.g., a mile feels longer tomorrow than a year from now) will evince the same pattern of reduced sensitivity to distance from a distal perspective as has been documented by prior investigations into within-dimension distancing (e.g., a day feels longer tomorrow than a year from now).

Within-Dimension Distancing

To begin, we consider the effect of psychological distance on sensitivity to further psychological distance from the same dimension. Research on this topic has been conducted primarily in the context of intertemporal choice, and the evidence from this tradition suggests that all time spans are not created equal but instead depend on the timing with which they occur. Specifically, human judgment and decision making consistently prove more sensitive to a constant span of time framed in the near versus distant future (for a review, see Frederick, Loewenstein, & O'Donoghue, 2002). This pattern of decreasing sensitivity with increasing temporal distance is reflected in a wide variety of intertemporal judgments and decisions, the most prevalent of which involves a reversal in preference between receiving a small reward sooner or a larger reward later. For example, one may prefer $5 now over $10 the next day but would simultaneously prefer $10 in 366 days over $5

This article was published Online First October 1, 2012.

Sam J. Maglio, Department of Management, University of Toronto, Toronto, Ontario, Canada; Yaacov Trope, Department of Psychology, New York University; Nira Liberman, Department of Psychology, Tel Aviv University, Tel Aviv, Israel.

We thank Michael Feder, Azeen Popal, and Elle Wang for their support with execution of the studies and Emily Balcetis, Cris Rabaglia, and Jim Uleman for helpful comments on this project. This research was supported by National Science Foundation Grant BCS-1053128 to Yaacov Trope and Cheryl Wakslak.

Correspondence concerning this article should be addressed to Sam J. Maglio, Department of Management, University of Toronto, 1265 Military Trail, Toronto, Ontario, M1C 1A4 Canada. E-mail: sam.maglio@utoronto.ca

in 365 days (see Thaler, 1981). Framed as a within-dimension sensitivity to temporal distances, a given span of time (1 day delay) exerts less influence on choice when it follows an initial instantiation (occurring 365 days in the future) than when it does not (occurring immediately); the subjective impact of that single day depends on its temporal distance.

Moreover, this phenomenon is not unique to time but also applies to probability and social distance (Green & Myerson, 2004; Rachlin & Jones, 2008; Rubinstein, 1988). Rachlin, Castrogiovanni, and Cross (1987) offered empirical evidence that preferences switched from small, likely payoffs to larger, less likely payoffs with the introduction of an initial probabilistic distance (i.e., reducing the probability that participants would encounter the tradeoff decision, see also Rachlin, Raineri, & Cross, 1991). With respect to social distance, Jones and Rachlin (2006) determined how much money participants would be willing to sacrifice for themselves (the reference point of social proximity) in order to give $75 to their best friend (#1 in terms of social proximity). They repeated this self-versus-other exercise for friends at position #2, 5, 10, 20, 50, and 100 (i.e., for increasingly distal others). As inferred from their choices, participants proved more sensitive to proximal versus distal spans of social distance: they sacrificed nearly $55 in the interest of their #10 friend, $40 for #20, and $25 for #50. Empirical consideration to date has provided indirect evidence in support of a similar effect for spatial distance (Holyoak & Mah, 1982).

Intertemporal preference reversals have been predominantly interpreted as a reflection of outcome value being systematically discounted over time. Specifically, decreasing value with increasing distance takes a hyperbolic form: The value of a delayed reward is discounted at a declining rate over longer periods of time (Kirby, 1997; Loewenstein & Prelec, 1992; Mazur, 1987). While these perspectives propose that value changes as a function of its removal in time (Loewenstein, 1996), other accounts conceptualize outcome value and (temporal) distance as independent factors that influence choice (Rubinstein, 1988, 2001, 2003). One such explanation bears relevance for the present investigation: insensitivity to prospective duration estimates (Zauberman, Kim, Malkoc, & Bettman, 2009). That is, subjective judgments of how long time will feel do not correspond to objective time but instead reflect a contraction such that people are more sensitive to proximal (the difference between one and 2 months from now) than to distal time intervals (between 35 and 36 months). The authors interpret this effect more broadly in terms of the Weber-Fechner law (Fechner, 1966/1860), whereby the threshold for discriminating between two stimuli increases logarithmically with the intensity of the stimuli (see also Dehaene, 2003; Grondin, 2001). For example, people may easily detect a change in weight between one and two pounds but would be unable to do so for weights of 35 and 36 pounds. In the present investigation, we build from this past research on prospective duration estimates to propose a similar diminishment of sensitivity across all psychological distances. Accordingly, if we conceptualize the different psychological distances as sharing a similar and interchangeable meaning, we would predict an initial instantiation of any distance to produce a similar reduction in sensitivity to a second instantiation of any dimension of distance. For example, we predict that a wait of 1 month would seem shorter when it pertains to a spatially more distant event.

The Common Currency of Psychological Distance

Let us return to the example with which we opened this article. To understand why the stretch of space from Syracuse to southern California would influence the felt social proximity between the couple and a potential invitee, we consider what the two dimensions have in common. As conceptualized by construal level theory (Liberman & Trope, 2008; Trope & Liberman, 2010), they both represent avenues through which a target of representation can be removed from one's immediate experience, with the self (or, in our example, the couple) as the egocentric reference point (see also Liberman & Förster, 2009). The theory posits four such dimensions of psychological distance: geographical space, time, probability, and social distance. Thus, a target can become distal by occurring in a remote location (Fujita, Henderson, Eng, Trope, & Liberman, 2006), in the future (Liberman & Trope, 1998), by being unlikely to occur (Wakslak, Trope, Liberman, & Alony, 2006), or by occurring to a socially more distal person (Liviatan, Trope, & Liberman, 2008; Stephan, Liberman, & Trope, 2010, 2011). While research has focused upon how these distances similarly affect mental representation and judgment, we propose that an initial instantiation of egocentric distance (e.g., from my hometown to San Diego) will reduce sensitivity to a given span of distance from another dimension (e.g., social distance from those populating the too-long guest list).

The dimensions of psychological distance have important similarities. If the different distances have an inherent common meaning, Bar-Anan, Liberman, Trope, and Algom (2007) reasoned that they should share a nonconscious association. In a series of studies, the activation of one distance dimension was shown to automatically activate the other dimensions. Participants were presented with pictures containing spatial depth cues, and words were presented against these backdrops to imply either general proximity or distance. Given the task to indicate as quickly as possible where the word was located (spatially near or far), participants responded fastest when the presented word matched the spatial distance cue (e.g., "us" presented proximally or "them" presented distally). Recently, Van Boven, Kane, McGraw, and Dale (2010) showed that manipulation of emotional intensity (compared with a neutral control condition) evokes a sense of psychological proximity in a manner consistent across three such dimensions (i.e., space, time, and social distance). In addition, a growing number of research programs have empirically manipulated different dimensions of psychological distance and found comparable effects across them when making similar judgments (e.g., Amit, Algom, & Trope, 2009; Eyal, Liberman, & Trope, 2008; Liberman & Förster, 2009; Rim, Uleman, & Trope, 2009; Stephan et al., 2010). Finally, in order to test more directly the relations among the different distances, Fiedler, Jung, Wänke, and Alexopolous (2012) examined people's judgments of spatial, temporal, probabilistic, and social distances from the same set of targets. The results showed positive correlations among the judgments of the four distances both for imagined and previously experienced target events. These findings support the idea of a unitary psychological distance dimension, and the fact that the different distances correlated in people's experiences suggests that ecological correlations among the distances might underlie the unitary psychological distance dimension.

While these lines of inquiry suggest that the separate dimensions of distance share a common underlying construct, their evidence supporting this conclusion has derived primarily from patterns of assimilation. That is, when the location (i.e., near or far) of a target on one dimension of distance is known (e.g., spatially far) but its location on other dimensions is unknown, people infer congruence of location on the other dimensions (e.g., temporally far). The present investigation considers circumstances under which it may be possible to observe a contrast effect, rather than an assimilation effect. We predict that this will occur when the magnitude is made explicit for two dimensions of distance. For example, a known time delay (i.e., a given magnitude of temporal distance) looms less large when framed as temporally distant (i.e., occurring in a year versus immediately, Zauberman et al., 2009). What would happen if that same known time delay were instead framed as *spatially* distant? In keeping with past research, we hypothesize that a contrast effect would obtain whereby the spatially distant framing would cause the constant, known amount of time to loom less large. This prediction is consistent with the general finding that assimilation occurs when the stimulus is ambiguous and contrast occurs when the stimulus is unambiguous (e.g., Herr, Sherman, & Fazio, 1983). Thus, we propose a contrast effect for cross-dimension instantiations of distance, to be manifested by a pattern of diminishing marginal sensitivity similar to that found within dimensions.

Cross-Dimension Distancing

Early evidence has provided indirect support for the hypothesis that an initial instantiation of psychological distance may reduce sensitivity to other dimensions. In one experiment, Pronin, Olivola, and Kennedy (2008, Study 4) asked three groups of participants to choose between receiving $50 immediately or $65 after a 2.5-month delay. The first group made the decision for themselves at that moment in time, and participants were split evenly between the two options. The instructions to the second group were similar to those to the first but with an initial time delay: $50 in 2.5 months or $65 in 5 months. Those in the third group made an immediate decision but were asked to decide what another (i.e., socially distant) student would prefer to receive. In the latter two conditions, participants predominantly chose the larger, delayed reward. From our perspective, this suggests that the instantiation of social distance decreased sensitivity to a delay of 2.5 months in a manner similar to an initial temporal delay of 2.5 months.

Keren and Roelofsma (1995) documented conceptually similar evidence for temporal distance and probability, whereby an initial instantiation of probabilistic distance (i.e., framing an outcome as unlikely) increased preference for a larger reward available after a time delay (see also Ahlbrecht & Weber, 1997; Weber & Chapman, 2005). Separate research has shown that gambles considered for the distant future give less consideration to the probability of winning, that is, diminished the impact of likelihood (Sagristano, Trope, & Liberman, 2002). These patterns of results suggest that an initial instantiation of distance may cause sensitivity to additional instantiations of other distances to diminish. However, these studies remain limited in their scope, targeting specific pairs of distances rather than an overarching perspective on distance that includes all four dimensions of psychological distance. The current investigation builds from the tenets of construal level theory to provide a more comprehensive understanding of the process underlying the effect of distance on further distance that is common to all psychological distances.

Overview of Studies

The present set of studies provides a systematic investigation into how psychological distance affects sensitivity to subsequent instantiations of psychological distance. As such, all of the studies will adopt a similar design: We first manipulate initial distance by framing the judgment task as either near or far (e.g., occurring in the present or in the future) and thereafter assess sensitivity to a constant, known amount of distance from another dimension (e.g., the magnitude of a given span of spatial distance). If the dimensions of psychological distance represent a sort of common currency of removal from immediacy, then the addition of a different type of distance onto an initial distance (e.g., adding a temporal delay to a spatially more distal event) should be functionally identical to adding distance onto the same distance (i.e., adding a temporal delay to a temporally more distal event)—that is, sensitivity to the second distance should diminish. As mentioned above, past research has established this within-distance-dimension effect for time, probability, and social distance and provided indirect evidence for cross-dimension diminished sensitivity to temporal distance following social and probabilistic distance. First, Study 1a builds from the limited work on cross-dimension distancing by considering the effect of social distance on sensitivity to time (Pronin et al., 2008); Study 1b replicates Study 1a while also providing evidence for an effect unique to distance. Thereafter, Study 2 considers the effect of probabilistic distance on sensitivity to time. Rather than assessing sensitivity to distance in a choice paradigm, each of these studies instead examine how initial distancing (socially, probabilistically) reduces direct magnitude estimation of further distance (i.e., time) but not for nondistance intervals.

Thereafter, Studies 3–8 examine the implications of cross-dimensional reduced marginal sensitivity to distance as reflected by preference reversals and more general decisions. Importantly, a reduced sensitivity to distance from a distal perspective should hold for all psychological distances. While others have raised this possibility (Liberman, Trope, & Wakslak, 2007; Van Boven, et al., 2010), it has not yet garnered empirical consideration. Therefore, we consider how this generalized pattern of diminishing sensitivity affects judgments and decisions for all distances. First, we assess how an initial instantiation of spatial distance reduces sensitivity to temporal delay of outcomes (Study 3), probability of outcomes (Study 4), and social distance of the beneficiary of an outcome (Study 5). Studies 6–8 apply a similar logic to different cross-dimension pairs of distance. We examine the effects of probabilistic distance (i.e., low likelihood) on social distance (Study 6) and social distance on probabilistic distance (Study 7). Finally, Study 8 offers evidence that a reduced sensitivity to the magnitude of an additional distance (i.e., space) mediates the effect of an initial distance dimension (i.e., time) on judgment. Table 1 provides a summary of the different distances examined in each specific study.

Table 1
Overview of Experiments by Initial and Second Distance

Second distance	Initial distance			
	Spatial	Temporal	Probabilistic	Social
Spatial		Study 8 ($J + D$)		
Temporal	Study 3 (D)		Study 2 (J)	Studies 1A & 1B (J)
Probabilistic	Study 4 (D)			Study 7 (D)
Social	Study 5 (D)		Study 6 (D)	

Note. The parentheses next to each specific study indicate the type of task performed by participants: J = judgment of subjective magnitude of second distance; D = decision designed to reflect sensitivity to second distance; $J + D$ = both types of tasks.

Study 1A: Socially Distancing Temporal Distance

When Pronin et al. (2008) asked participants to decide between receiving a small reward sooner or a large reward later (i.e., removed by a span of temporal distance), they found a comparable effect of initial temporal and social distancing: People were more likely to opt for the large reward later regardless of how the span of time was initially distanced. While this finding is consistent with a diminished sensitivity account, research to date has not examined the effect of initial psychological distancing on direct magnitude estimation for additional distances. Study 1a considered the same distances as Pronin et al. to suggest that an initial instantiation of social distance shrinks the subjective magnitude of a constant span of temporal distance.

Method

Forty-nine undergraduates from New York University participated in this study as part of a battery, in which many researchers, from different labs, put short unrelated questionnaires; participants received course credit for their participation. They were told that the study related to perception of events. All participants were informed of an organization called the Earth Clinic, a research group dedicated to addressing real world problems related to sustainable development. Next, to manipulate initial social distance, participants were randomly assigned to condition in which they were told that, "the Earth Clinic is composed of faculty members from several different disciplines at," either New York University (socially proximal, $n = 25$) or Columbia University (socially distal, $n = 24$). The Earth Clinic was said to have a committee in charge of electing a chairperson as its general director every 2 years, with the next election scheduled to take place during the same month as their experimental session and the subsequent election scheduled for 2 years after that. Given this information, participants were asked, "How long does the 2 years between the successive elections feel to you for the Earth Clinic chairperson position?" Responses were made on a scale from 1 (*not at all long*) to 7 (*very long*).

Results and Discussion

The social distance of the Earth Clinic significantly affected subjective ratings for a constant span of time, $F(1, 47) = 4.88$, $p = .03$, $\eta^2 = .09$. Specifically, participants believing the committee to be affiliated with a socially distant group indicated that the 2-year interval between the elections felt shorter ($M = 3.33$, $SD = 1.09$) than did those for whom the committee was socially proximal ($M = 3.96$, $SD = 0.89$). Thus, by framing the same objective amount of time as socially distant (rather than proximal), the subjective duration of that span was reduced.

Study 1B: Socially Distancing Temporal Distance or Money

Our first study provides evidence that social distance subjectively shrinks the magnitude of a constant span of temporal distance. However, it cannot eliminate the possibility that social distance—or distance in general—simply reduces sensitivity to the magnitude of any amount. Here, we tested the hypothesis that initial distancing diminishes sensitivity exclusively to further distance. Building upon past evidence that psychological distance does not cause a universal loss in sensitivity to all features of targets (Liberman, Trope, & Stephan, 2007; Trope & Liberman, 2010), Study 1b sought to replicate Study 1a with the addition of one experimental factor: whether participants evaluated the subjective magnitude of time or money. We predicted that social distance would again temper sensitivity to a span of time but not to an amount of money.

Method

Ninety-five undergraduates from New York University participated in this study in exchange for course credit. The design and procedure were nearly identical to those of Study 1a with the exception that participants were randomly assigned to evaluate the subjective magnitude of either a span of time or an amount of money. All participants again learned about the Earth Clinic (randomly identified as socially proximal or distal) but now two pieces of information about it. First, they learned about its election schedule (described above). Additionally, they learned that, "over the course of the next 2 years, the financial holdings of the Earth Clinic are expected to increase from $300,000 to $450,000." Subsequently, participants assigned to consider time responded to the question, "How long does the 2 years between the successive elections feel to you for the Earth Clinic chairperson position?" Those assigned to consider money responded to the question, "How large does the $150,000 projected increase feel to you for the Earth Clinic financial holdings?" All participants responded on a scale from 1 (*not at all long/large*) to 7 (*very long/large*).

Results and Discussion

We first converted participants' magnitude estimates to standardized z scores in order to provide meaningful comparisons

between estimates made for time and for money. We observed neither a significant main effect for the target of evaluation nor a main effect of initial social distance (Fs < 1) but did observe the predicted interaction between these two factors, $F(1, 91) = 3.63$, $p = .06$, $\eta_p^2 = .04$. Among participants evaluating time, we replicated Study 1a in which the 2-year interval felt shorter for the socially distant committee relative to the socially proximal committee, $F(1, 45) = 4.18$, $p = .047$, $\eta^2 = .09$. Evaluations of money did not differ as a function of social distance ($F < 1$). Here, social distance subjectively shrank a given span of time but did not shrink a given amount of money. More broadly, this suggests that the effect of initial psychological distance in tempering sensitivity to magnitude does not apply universally to all features but rather uniquely to further distance. Though it remains possible that initial distance could also reduce sensitivity to nondistance magnitudes, Study 1b suggests that the effect of diminished sensitivity is stronger for magnitudes related to distance.

Study 2: Probabilistically Distancing Temporal Distance

In a manner similar to Pronin et al. (2008), Keren and Roelofsma (1995) presented participants with a financial choice between small soon and large later. Participants preferred the large later option upon framing the reward as the outcome of a gamble that was unlikely to be won (i.e., probabilistically distal). To suggest that our phenomenon generalizes beyond social distance (Studies 1a & 1b) and to offer a possible mechanism, Study 2 manipulated initial probabilistic distance and then asked participants to estimate the magnitude of a constant span of time. We predicted that initial probabilistic distance should reduce magnitude estimates for a set amount of time.

Method

Forty volunteers were recruited from a survey platform site hosted by Amazon.com. They received a small gift certificate in exchange for completing a survey related to television viewing. All participants were asked to imagine that they planned on watching television that evening. Specifically, they were asked to imagine that they would watch it, "live (i.e., without a DVR), on the same single channel, and for 2 hours in a row." They were told that, "because you will be watching television live, you will see not only the shows but also the commercials that run during them." Next, the instructions indicated that a local car company hoped to air a series of commercials that evening. As part of a strong ad campaign, they intended to air the same commercial twice in the 2-hr window during which participants would be watching television; the two airings would occur 40 min apart. Participants were informed that the company was, "still in the process of editing their commercial, making it uncertain whether they will finish in time to be able to air it this evening," and that if it did not air, other commercials would take its place. To manipulate initial probability, participants were randomly assigned to condition in which they were told that either, "it is likely that they will make the cutoff—there is a 90% chance that the commercial will air tonight," ($n = 20$), or "it is unlikely that they will make the cutoff—there is a 10% chance that the commercial will air tonight," ($n = 20$). Subsequently, participants were asked, "How long does the 40 minutes between the two potential airings of the commercial feel to you for the ad campaign?" Responses were made on a scale from 1 (*not at all long*) to 7 (*very long*).

Results and Discussion

The likelihood with which the commercial would air significantly affected subjective ratings for a constant span of time, $F(1, 38) = 4.25$, $p = .046$, $\eta^2 = .10$. Specifically, participants in the unlikely condition indicated that the 40-min interval between two airings of the commercial felt shorter ($M = 3.25$, $SD = 1.41$) than did those in the likely condition ($M = 4.25$, $SD = 1.65$). Because the person would be watching television in either case, with another set of advertisements filling the same airtime if the car commercials did not run, this pattern cannot be explained simply by relevance. Instead, these results suggested that an initial instantiation of probabilistic distance subjectively shrunk the subjective magnitude of a further instantiation of temporal distance. Though the magnitude of the temporal distance differed between Studies 1 (2 years) and 2 (40 min), they arrive at the same conclusion. Taken together, Studies 1 and 2 provide evidence that spans of time shrink in the mind's eye when framed as psychologically distal. Next, Study 3 examines a consequence of such shrinking time for decision making, using spatial distance as the initial dimension to augment our proposed generalizability for all psychological distances.

Study 3: Spatially Distancing Temporal Distance

Given the preponderance of empirical attention devoted to temporal distance and its role in financial decisions (Frederick et al., 2002; Zauberman et al., 2009), Study 3 tested sensitivity to time as a function of spatial distance. Here, we operationalized spatial distance as the physical location of a bank and assessed sensitivity to time not using direct estimation but instead as a binary decision. Specifically, participants chose between receiving a smaller, immediate payoff versus a larger, delayed payoff, with the funds being deposited into either a spatially proximal or distal bank. We predicted that the time delay would exert a weaker influence on a choice following an initial instantiation of spatial distance, leading a larger proportion of participants to choose the larger, delayed payoff.

Method

Ninety volunteers were recruited from the greater New York City area and asked to complete a research survey in exchange for entry into a lottery with a 1 in 100 chance to win $50. Participants were informed that payment to the winner would be administered through FundSource, a (fictitious) e-commerce business similar to PayPal. The experimenter would set up an account in FundSource for the winner, accessible online and into which the reward would be deposited. We manipulated spatial distance by informing participants that the funds for the winner would be, "deposited into and held at the central bank for FundSource," which was said to be located in either a geographically near (New York City, $n = 45$) or distal (Los Angeles, $n = 45$) location.

Participants were then presented with a financial decision (adapted from Pronin et al., 2008). Were they to win, they indi-

cated whether they would prefer, "a $50 payment made to my account and available immediately upon winning" or "a $65 payment made to my account and available as of January 1st, 2010" by checking the appropriate box. As this study was conducted in early October of 2009, the larger reward was available after a 3-month delay (ostensibly because new payment schedules were to be implemented at the onset of 2010, which coincided with our intended 3-month delay). To assess a potential confound, we next asked participants, "How difficult do you think it would be to access your payment should you win the lottery?" These responses were made on a scale from 1 (*not at all*) to 9 (*very much*).

Results and Discussion

The decision to choose the larger, temporally later reward significantly varied as a function of spatial distance, $\chi 2\ (1, N = 90) = 4.63$, $p = .031$. Specifically, participants in the distal condition were more likely to choose the larger, temporally delayed reward (71%) than those in the proximal condition (49%). Figure 1 provides a graphical representation of the choices. Given the novelty of this paradigm, in addition to our use of it again in the present investigation (see Study 5), we considered a potential confound arising from this methodology. With respect to the perceived difficulty of accessing the reward, we observed a marginal effect (in the opposite direction of our initial concern), such that participants in the proximal condition expected to experience slightly greater difficulty ($M = 4.91$, $SD = 2.70$) than those in the distal condition ($M = 4.02$, $SD = 2.05$), $t(87) = 1.75$, $p = .08$. To adjust for this trend, we performed a logistic regression to predict preference for the larger, later reward as a function of both spatial distance and expected difficulty (mean centered). Supporting our hypothesis, participants in the spatially distant condition remained more likely to choose the larger reward ($B = 0.92$, odds ratio = 2.51, $p = .043$) after adjusting for expected difficulty, which was a nonsignificant predictor in the model ($B = 0.02$, $p > .8$).

Therefore, we conclude from Study 3 that sensitivity to time—as reflected in time-dependent choice—decreases with the introduction of initial spatial distance. Whereas past research on time discounting has suggested that an initial span of temporal distance can shift preference and choice from small-soon to large-later (e.g., Thaler, 1981), this is the first study to provide evidence for a similar phenomenon following an initial instantiation of spatial distance. In order to further develop our cross-dimension diminishing sensitivity perspective, we next turned our attention to the influence of spatial distance on probability.

Study 4: Spatially Distancing Probability

Results from Study 3 suggested that a span of temporal distance loomed less large when situated in a distal (vs. proximal) physical location, sufficient to change the pattern of decisions made by participants. Our next study builds upon research suggesting a similarity between intertemporal and risky or unlikely decisions (Keren & Roelofsma, 1995; Prelec &

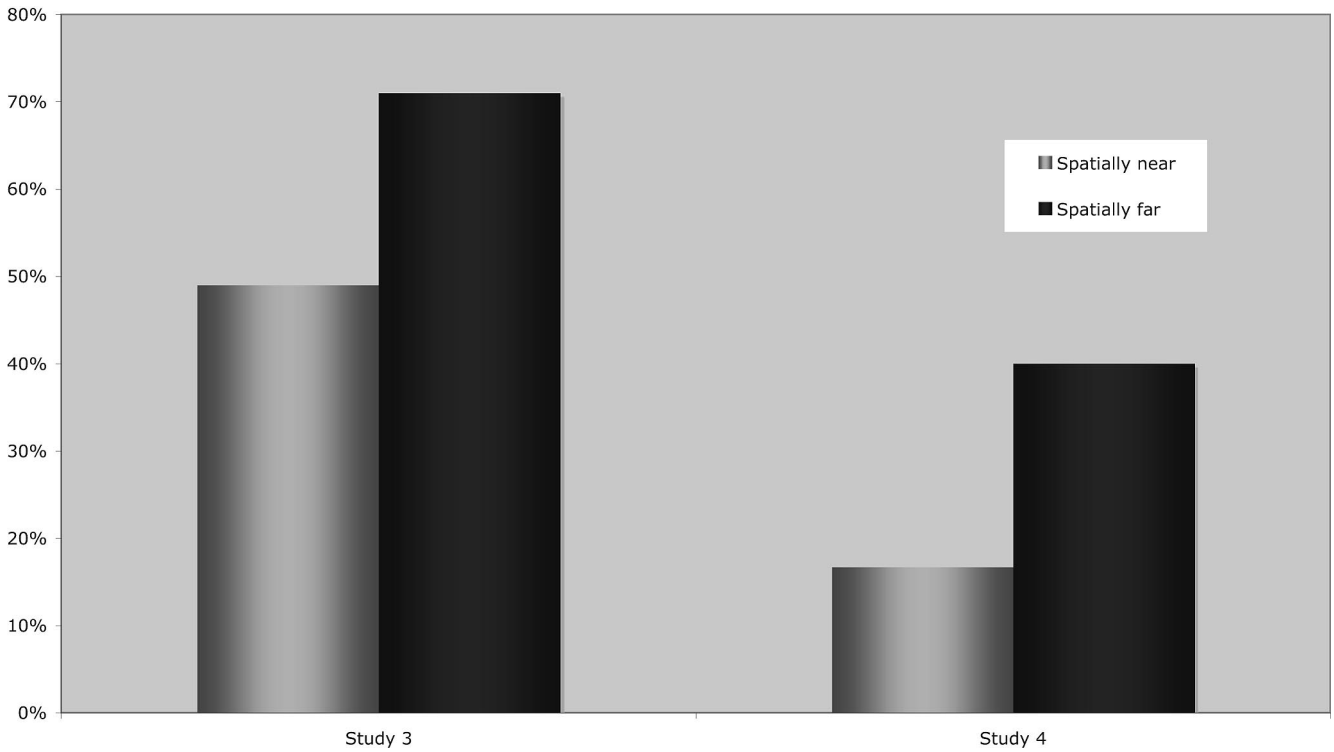

Figure 1. Preference for the larger reward by condition, Studies 3 and 4. Higher scores indicate more preference for the larger reward after a time delay (Study 3) or for the larger, less likely reward (Study 4). The spatially distant location was framed as Los Angeles in Study 3 and Chicago in Study 4; the spatially near location was New York City for both.

Loewenstein, 1991). Given this perspective, we next predicted that an initial instantiation of spatial distance would decrease sensitivity to probability in the same manner as it did for temporal distance in Study 3. As a reduction in likelihood reflects an instantiation of psychological distance (Todorov, Goren, & Trope, 2007; Wakslak et al., 2006), participants should prove less sensitive to any such distancing that occurs far away relative to an identical distancing nearby.

Method

Sixty undergraduates from New York University participated in this study as part of a battery, in which many researchers, from different labs, put short unrelated questionnaires; participants received course credit for their participation. They were told that the study related to lottery choices. Although it did not entail a real outcome, participants were asked to imagine making their choice as if it did (for evidence that people treat real and hypothetical scenarios similarly, especially with respect to psychological distance, see Locey, Jones, & Rachlin, 2011). Before presenting the options, they were told that the outcome of the lottery would be, "determined by an NYU business affiliate using a random number generator," which was said to be located in either a geographically near (New York City, $n = 30$) or distal (Chicago, $n = 30$) location. To assess sensitivity to probability, they were asked, "Which lottery do you prefer?" and circled one of the following two options: "an 80% chance of winning $50" or "a 20% chance of winning $200" (Porcelli & Delgado, 2009). As such, both lotteries had an identical expected value ($40) and were utilized to suggest that different preferences among them should reflect sensitivity to the probability of winning.

Results and Discussion

The decision to choose the larger, less likely reward significantly varied as a function of spatial distance, $\chi^2(1, N = 60) = 4.02$, $p = .045$. A logistic regression confirmed our prediction: Participants in the distal condition were more likely to choose the larger reward (40%) than those in the proximal condition (17%; $B = 1.20$, odds ratio $= 3.33$, $p = .050$). Figure 1 provides a graphical representation of the choices. This finding supports the notion that sensitivity to probability—like that to time—is tempered from a spatially distal perspective. In important methodological changes, Study 4 framed the initial instantiation of spatial distance (to New York-based participants) via Chicago (rather than Los Angeles, as in Studies 3 and 5) and examined not the physical location of money but rather the location of an event to test the robustness of our effect. Further, this study (in tandem with Study 3) suggests that a predominant tradeoff used in financial decision research—that between small soon and large later—may be more broadly framed as small *close* versus large *further*. Study 4 provides evidence that people shift their choices to large further following the introduction of an initial instantiation of psychological distance, which reduces sensitivity to the difference between close and far. To extend the conceptualization of close versus further vis-a-vis an initial instantiation of geographical space, we turn in Study 5 to social distance.

Study 5: Spatially Distancing Social Distance

Using different paradigms, Studies 3 and 4 examined the influence of spatial distance on temporal and probabilistic distance, respectively. To suggest that geographical space diminishes sensitivity to all psychological distances, Study 5 considers the fourth and final dimension of psychological distance identified by construal level theory: social distance. Other people vary in their social distance from the self along a continuum from socially closest (e.g., best friend) to successively more distal members of one's social network (for other treatments of social distance, see Liviatan et al., 2008; Smith & Trope, 2006). Jones and Rachlin (2006; Rachlin & Jones, 2008) quantified this dimension of psychological distance, showing that it manifests a (within-dimension) discount rate similar to time and probability. What remains unknown to this point is the effect of other psychological distances on sensitivity to social distance. Study 5 utilized their paradigm, asking participants to think about the fifth- and twentieth-closest members of their social network and subsequently eliciting a valuation of the social distance between them. We framed this constant (15-person) span of social distance as either spatially near or far using a design similar to that of Study 3. Here, we predicted valuations that reflected diminished sensitivity to social distance from a spatially distant perspective.

Method

Sixty-five undergraduate volunteers were recruited from the New York University community and asked to complete a research survey related to social networks. Following the methodology of Jones and Rachlin (2006), participants first were asked to imagine having a list of the 100 people closest to themselves in the world, with their best friend at position #1 and a mere acquaintance at position #100. They were asked to think specifically about the person who would best fit at position #5 and position #20.

Next, participants were told that the survey was intended to design a question for later research related to financial decision making and social networks. We were ostensibly interested in designing a difficult question to ask other people about tradeoffs between friends. Participants were asked to imagine making the choice between having New York University give a cash gift of $75 to the #5 person on their list or some amount of money to the #20 person. To elicit their indifference point, we asked them to choose the amount of money (endowed to #20) that would make this question perfectly difficult: above this amount they would always choose to have #20 receive the cash gift, and below this amount they would always choose the $75 payment to #5.

Before determining a value, we asked participants to read through a description of how the payment would be administered to the chosen recipient when the future survey would be conducted. Although they were supposedly helping only to design a question to give to others, we told them to read through this information in the interest of treating the decision as if it were real. In fact, they were given the same manipulation of spatial distance as in Study 3: The payment was to be administered through FundSource, with the payment deposited into its central bank located in either a geographically near (New York City, $n = 32$) or distal (Los Angeles, $n = 33$) location. After reading through this information, participants answered the aforementioned indiffer-

ence question: "What is the value that would make this most difficult? $75 to #5, or $_____ to #20?"

Results and Discussion

Spatial distance significantly affected indifference values, $F(1, 63) = 7.50$, $p = .008$, $\eta^2 = .11$. Participants in the distal condition required fewer dollars ($M = 173.33$, $SD = 87.4$) to make the question perfectly difficult compared to those in the proximal condition ($M = 246.16$, $SD = 124.4$). That is, participants were less sensitive to the difference between the same two members of their social network when first experiencing an initial instantiation of spatial distance. With this study, we have established that initial spatial distance affects choices designed to reflect sensitivity to each additional dimension of psychological distance: temporal (Study 3), probabilistic (Study 4), and social (Study 5). While our first two studies investigated the direct estimation of distance (i.e., time) as a function of social (Studies 1a and 1b) and probabilistic (Study 2) distance, our next two studies consider downstream consequences of how probabilistic distance affects social distance (Study 6) and vice versa (Study 7).

Study 6: Probabilistically Distancing Social Distance

To suggest that probability not only shrinks subjective time (Study 2) but also shapes choices that reflect sensitivity to other cross-dimensional distances, Study 6 assessed sensitivity to social distance (in a manner similar to Study 5) from either a near (likely) or far (unlikely) perspective. We predicted that a probabilistically distal perspective would result in judgments less sensitive to differences between others on a hierarchy of social proximity. Additionally, we addressed new potential confounding factors.

Method

Sixty-one volunteers were recruited from the same survey platform as Study 2 and received the same compensation in exchange for completing a survey related to lottery preferences. The instructions indicated that the lottery would differ from most in that rather than deciding whether to purchase an entry and receiving the reward for oneself, it provided a free entry with the reward going to a member of the participant's social network. Here, participants were randomly assigned to condition in which they were told that they were either, "highly likely to win the lottery—the probability of winning is 90%," ($n = 31$), or, "highly unlikely to win to win the lottery—the probability of winning is 10%," ($n = 30$). As in Study 5 and Jones and Rachlin (2006), participants then imagined having a list of the 100 people closest to themselves, with their best friend at position #1 and a mere acquaintance at position #100, and identified the people who would best fit at position #5 and position #20.

Afterward, participants completed the lottery decision task, asking them to "Please use the following scale to indicate your preference regarding the lottery." Responses were made on a scale from –3 (*strongly prefer $75 for #5*) to +3 (*strongly prefer $125 to #20*), with a midpoint at 0 (*no preference*). In addition to the preference question, participants indicated how carefully they considered the choice, how important the choice was to them, and how invested they felt in making a good choice; all responses were made on a scale from 1 (*not at all*) to 5 (*very much*).

Results and Discussion

The probability of winning the lottery significantly affected preference for who should receive the reward, $F(1, 59) = 4.61$, $p = .036$, $\eta^2 = .07$. Specifically, participants in the unlikely condition felt more inclined to give the larger reward to the more distal (i.e., #20) person ($M = -0.83$, $SD = 1.49$) than did those in the likely condition ($M = -1.68$, $SD = 1.58$). Additionally, in comparison to those in the unlikely group, those with the highly likely chance of winning the lottery considered the choice more carefully ($p = .05$), believed it to be more important ($p = .02$), and felt more invested in making a good choice ($p = .01$). We next conducted analysis of covariance (ANCOVA) to predict lottery preference from condition while adjusting for each of these factors. Importantly, the effect of distance condition was supported in each of these tests, Fs$(1, 58) > 2.83$, ps $< .10$, η_p^2s $> .04$, whereas the effect of the covariates dropped to nonsignificant levels, Fs$(1, 58) < 1.43$, ps $> .23$. Echoing the finding of Study 5, participants were less sensitive to the difference between the same two members of their social network when first experiencing an initial instantiation of psychological distance. Importantly, the same reduction in sensitivity occurs following not only spatial distance (Study 5) but also probabilistic distance (Study 6).

Study 7: Socially Distancing Probabilistic Distance

If, as we suggest, the dimensions of psychological distance are interchangeable in producing cross-dimensional reduction in sensitivity, then initial social distance should impact sensitivity to probability in the same way that initial probabilistic distance impacted social distance in the previous study. Therefore, Study 7 simply reverses the design of Study 6, operationalizing social distance as the independent variable (making choices for near or distant others) and sensitivity to probability as the dependent variable. Because feeling states can affect judgments of probability as well as general patterns of thought (Gasper & Clore, 2002; Johnson & Tversky, 1983), we take this opportunity to control for the potential confounds of positive and negative mood in making choices for different members of one's social network.

Study 7 also expands the scope of our methodology to empirically manipulate initial psychological distance not as a binary near-versus-far distinction but rather at different levels of distance ranging along a continuum from near to far (Liberman, Trope, & Stephan, 2007; Trope & Liberman, 2010). This provides an extension of and complement to the self–other distinction documented by Pronin and colleagues (Pronin, 2008; Pronin, Gilovich, & Ross, 2004; Pronin et al., 2008). Specifically, we asked participants to make decisions for the person at either position #5, #45, or #95 in social proximity; the decision they made reflected sensitivity to probabilistic distance. Consistent with the literature on within-dimension distancing, we predicted that the choices made for a close person (#5) would differ from those made for distal persons, but the choices made for sufficiently distal persons (#45 and #95) would not differ. To consider cross-dimension distancing effects, the nature of those choices related to sensitivity to further distance. As a result, we predicted that participants would express a stronger preference for high-probability outcomes for close (#5) than distal others (regardless of whether #45 or #95).

Method

Ninety volunteers were recruited from the same survey platform as Studies 2 and 6 and received the same compensation for providing ratings of a lottery. The lottery was said to differ from most in that it provided a free entry into one of two lotteries with the reward going to a member of the participant's social network. All participants imagined having a list of the 100 people closest to themselves (Jones & Rachlin, 2006). Next, they were randomly assigned to condition in which they were asked to, "think of the person who would best fit on that list," at position #5, #45, or #95 (*n*s = 30); they were to consider the two lotteries on behalf of this person. The specific lotteries were similar to those in Study 4, carrying either an 80% chance of winning $50 or a 20% chance of winning $200 (Porcelli & Delgado, 2009).

In completing the lottery decision task, participants were asked to "Please use the following scale to indicate your preference regarding the lottery." Responses were made on a scale from –3 (*strongly prefer 80% chance of $50*) to +3 (*strongly prefer 20% chance of $200*), with a midpoint at 0 (*no preference*). Thereafter, participants indicated how carefully they considered the choice, how important the choice was to them, how invested they felt in making a good choice, and the extent to which they were currently experiencing positive and negative emotion. All responses were made on a scale from 1 (*not at all*) to 5 (*very much*).

Results and Discussion

The manipulation of social distance significantly affected preference in the lottery decision task, $F(2, 87) = 3.36$, $p = .039$, $\eta^2 = .07$. Post hoc analyses (least significant difference [LSD]) revealed that participants showed a stronger preference for the more likely, low-payoff lottery when deciding for their fifth-closest person ($M = -1.53$, $SD = 1.33$) than when deciding for the person at position #45 ($M = -0.77$, $SD = 1.70$, $p = .09$) or for the person at position #95 ($M = -0.40$, $SD = 2.08$, $p = .01$). Ratings made by participants in the latter two conditions did not differ ($p > .4$). Figure 2 provides a graphical representation of these ratings. Next, we conducted a planned contrast between lottery preference ratings made by those deciding for person #5 (coded +2) versus those deciding for persons #45 and #95 (each coded –1). This analysis yielded a significant result, $t(87) = -2.46$, $p = .02$. Participants did not vary between condition in rating the decision on carefulness of consideration, importance, feeling invested, or eliciting positive or negative emotion, Fs$(2, 87) = 1.15$, $p > .3$.

Thus, Study 7 makes two important additions to the current investigation. First, it suggests that positive and negative emotional experience (in addition to consideration, importance, and investment) do not vary as a function of making decisions for socially proximal versus distal others. Second, it provides the first evidence that an initial instantiation of distance simultaneously reduces sensitivity to further distance both within and across dimensions. Once a cross-dimension span of distance (i.e., reduction in likelihood) became sufficiently far away (from person #5 to person #45), further distancing along the initial dimension (to person #95) did not change ratings presumably based on sensitivity to the cross-dimensional distance. Still, this point touches upon one remaining limitation: direct assessment of distance sensitivity as a mediating process. Thus far, we have assessed distance

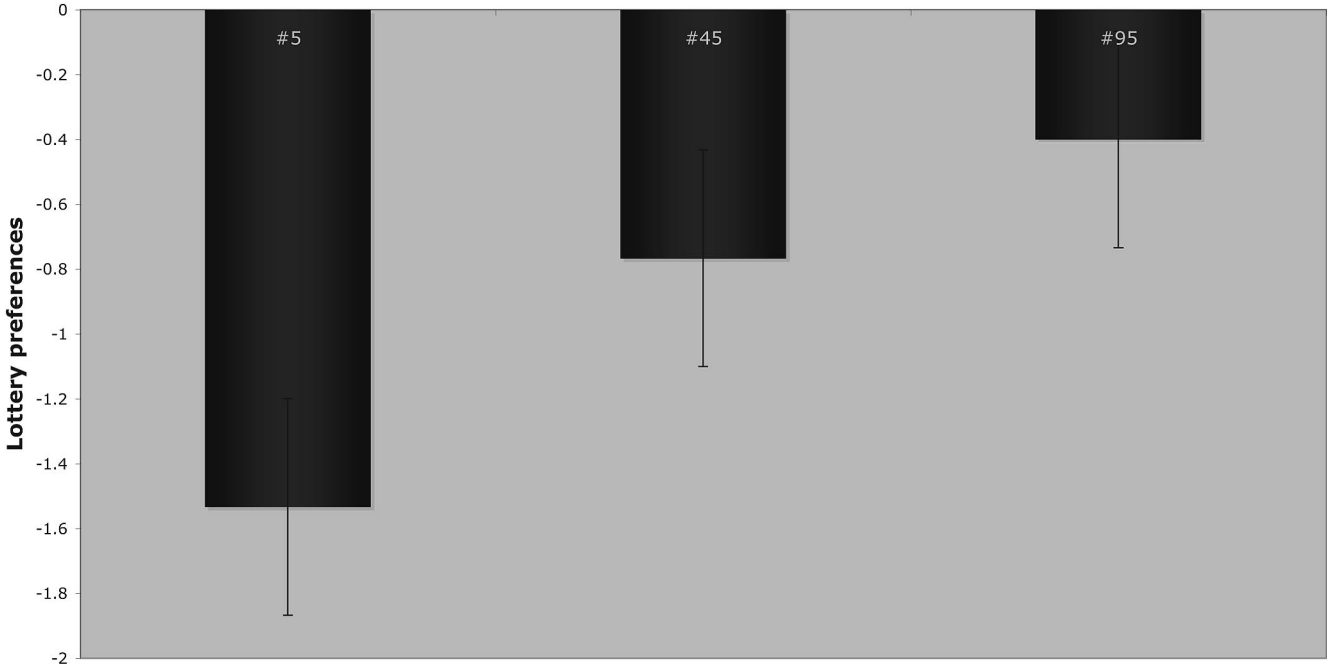

Figure 2. Lottery preference by social distance condition, Study 7. Numbers printed inside columns indicate social distance condition, whereby participants made choices for either the fifth, 45th, or 95th closest member of their social network. More negative scores indicate stronger preference for a lottery with a smaller, more likely reward. Bars indicate standard error.

sensitivity using direct magnitude estimates (Studies 1 and 2) and judgments and decisions (e.g., valuation, choice preference) for tasks whose outcomes conceivably reflect responsiveness to further distances (Studies 3–7). Integrating these findings, the question arises as to whether subjective appraisal of further distance accounts for the effect of initial distance on judgments and decisions designed to reflect sensitivity to it.

Study 8: Temporally Distancing Spatial Distance

While several studies presented thus far have tested outcomes that seem to reflect sensitivity to spans of distance as a function of psychological proximity or distality, our final study examines subjective magnitude of further distance as a mediator of the relationship between initial psychological distance and choices designed to capture distance sensitivity. To consider yet another pairing of psychological distances, we tested this prediction as it relates to the effect of temporal distance on spatial distance. Participants imagined having an opportunity to visit a museum in either the near or distant future as an initial instantiation of temporal distance. Before asking how interested they would be in visiting the museum, they provided a subjective rating of the ostensible distance between their home and the museum, kept constant across condition. We expected that the same objective magnitude of psychological (i.e., spatial) distance would vary in subjective magnitude as a function of initial proximity or distality, looming less large from a psychologically (i.e., temporally) distal perspective and thereby accounting for an increased interest in actually making the trip.

Method

Seventy volunteers were recruited from the same online platform as above and received the same compensation for a survey related to museum visitation. Participants were asked to imagine receiving two free passes to a new museum that was scheduled to open at a site located 27 miles away from their home. We randomly assigned them to condition ($ns = 35$) in which the instructions indicated that the museum was scheduled to open in either the near future ("1 week from today") or the distant future ("1 year from today").

First, we asked participants, "How far does the 27 miles between your home and the museum feel to you?" They responded on a scale ranging from 1 (*not at all far*) to 7 (*very far*). Subsequently, we asked them, "How interested are you in using your passes to visit the museum?" These responses were made on a scale from 1 (*not at all interested*) to 7 (*very interested*). Finally, they answered questions identical to those in Studies 6 and 7 regarding careful consideration, choice importance, and investment in the choice, all on the same scale from 1 (*not at all*) to 5 (*very much*).

Results and Discussion

The opening date for the museum significantly affected interest in visiting the museum, $F(1, 68) = 5.32$, $p = .024$, $\eta^2 = .07$. When the museum was scheduled to open in 1 year, participants were more interested in visiting ($M = 5.86$, $SD = 0.94$) than when the opening was 1 week away ($M = 5.23$, $SD = 1.31$). Additionally, participants rated the subjective magnitude of the same 27-mile span as smaller when the museum was to open in the distant ($M = 3.54$, $SD = 1.54$) versus near ($M = 4.43$, $SD = 1.20$) future, $F(1, 68) = 7.22$, $p = .009$, $\eta^2 = .10$. Ratings did not differ by condition for careful choice consideration, choice importance, or investment in the choice, $Fs(1, 68) < 1.3$, $ps > .25$.

In a mediation analysis, we considered whether the decrease in subjective magnitude of spatial distance for participants in the distant future condition accounted for their increased interest in traversing that distance to visit the museum. We conducted this analysis using a bootstrapping procedure to determine a confidence interval (CI) for the indirect effect of timing condition on interest in visiting through subjective distance (Preacher & Hayes, 2004). As shown in Figure 3, the results supported this predicted relationship ($p < .05$; 95% CI = 0.06, 0.62). Thus, the introduction of temporal distance caused a stretch of spatial distance to subjectively shrink, which in turn made people more interested in visiting a museum located at the other end of that span of space. More broadly, Study 8 illustrates how an initial instantiation of distance tempers the influence of further distances in judgments and decisions by directly reducing the subjective magnitude of such further distances.

General Discussion

Psychological distance has emerged as a predominant focus of research across multiple domains of psychological inquiry. Its relevance derives from the ubiquity of spatial, temporal, probabilistic, and social factors in judgments and decisions made every day: In order to represent a target outside immediate experience, people must mentally traverse psychological distance. Given the manifold ways in which distance can be instantiated and combined, it is important to understand not only binary near-versus-far distinctions but also the impact of psychological distance on psychological distance itself.

Across nine studies, the present research suggests that the relevance of any span of distance is reduced when it is framed as distal. Studies 1a, 1b, and 2 first built from extant research on cross-dimension distancing to suggest that initial distance causes subjective magnitude estimates of further distances to shrink. Furthermore, Study 1b offered evidence that the effect of initial distance is stronger on other distances than on nondistance related quantities (i.e., money), consistent with the notion of a unique

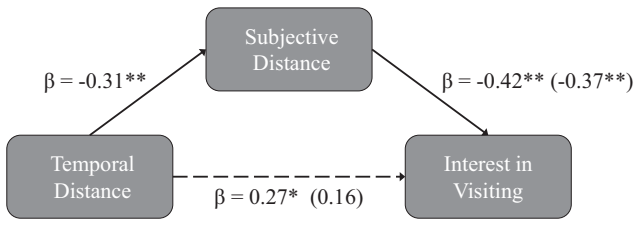

Figure 3. Distance sensitivity as a mediator between temporal distance and judgment, Study 8. Betas outside parentheses represent standardized regression coefficients for the direct relationships between the variables; betas inside parentheses represent regression coefficients for the strength of the relationships between two variables after statistically adjusting for the other variable in the model. * $p < .05$. ** $p < .01$.

relationship between the separate dimensions of psychological distance. Results from six subsequent studies suggested that, in decision contexts, an initial instantiation of any psychological distance diminishes cross-dimension sensitivity to any other psychological distance. We base this conclusion on the fact that, across all of our studies, each of the four dimensions of distance were used at least once as both the initial as well as the second distance. For the initial psychological distance dimension, we used space (Studies 3–5), time (Study 8), probability (Study 2), and social distance (Studies 1a and 1b); for the second distance, we used space (Study 8), time (Studies 1a, 1b, 2, and 3), probability (Studies 4 and 7), and social distance (Studies 5 and 6). Thus, the present investigation offers the first systematic treatment of how distance affects distance. We further identify the simultaneous effects of within- and across-dimension distancing (Study 7) and establish that subjective sensitivity to further distance mediates the effect of initial distance on choice (Study 8). Finally, in considering alternative interpretations, we eliminate expected difficulty (Study 3), mood (Study 7), and general effort (Studies 6–8) as potential confounding factors, suggesting that a direct effect of psychological distance on distance accounts for our findings. Together, these studies contribute to construal level theory by documenting a robust pattern of diminishing sensitivity to cross-dimensional distance from a distal perspective.

Common Currency Revisited

Each of the current studies targeted a specific operationalization of psychological distance: removal from an egocentric reference point anchored in the here and now (Liberman & Förster, 2009). In a departure from prior research on this topic, we manipulated the distance not of a person, a product, or an event, but of a given span of distance itself. This subsequent distance always had two important features: It was from a different dimension than the initial distance, and its objective magnitude was made known to participants in explicit terms (e.g., a 3-month time delay, Study 3, or the difference in likelihood between 80% and 20%, Studies 4 and 7). In asking what distance does to distance itself, the current investigation provided evidence for a psychophysical Weber-Fechner law for cross-dimensional distance, yielding diminished sensitivity to distance from a distant perspective. As such, the results support our theoretical account that the four dimensions of distance reflect a shared significance (namely, removal from immediate egocentric experience).

We considered only the aforementioned four dimensions of psychological distance because past research had suggested that, for the purposes of the present investigation, these dimensions operate interchangeably. By representing naturalistic avenues along which people mentally transcend the here and now, they reflect a common core of distance in much the same way that the overall value of a target is determined by different sources or inputs. We would expect our effect to generalize to any other possible definition or variety of distance (e.g., experiential or perspective distance, Fiedler, 2007; emotional intensity, Van Boven, et al., 2010) insofar as it taps into a similar sense of removal from immediacy. Beyond engendering a sense of proximity or distality, the dimensions of psychological distance have important objective and subjective differences (the past, while temporally distant, is also less hypothetically distant in that it actually happened), which remain important but beyond the scope of this investigation (see, e.g., Caruso, Gilbert, & Wilson, 2008; Van Boven & Ashworth, 2007). A related question asks whether one specific distance may be more fundamental than the others (Boroditsky, 2000; Green & Myerson, 2004). For example, a time delay may be interpreted in terms of a reduction in probability, as there is always the possibility that a future reward will not be received.[1] Whether (or to what extent) all distances are, in this respect, created equal remains an open question for future research.

Level of Mental Construal

Our findings offer new insights for level of mental representation. Construal level theory contends that a target can be psychologically removed from immediate experience along any of the distance dimensions and that such distancing engenders representation of the target in terms of its central, abstract properties. Conversely, targets that are proximal are represented in terms of their incidental, concrete details (Liberman & Trope, 1998, 2008; Trope & Liberman, 2010). Though research to date has focused predominantly on how individual instantiations of distance influence mental construal, a recent extension has considered the joint impact of multiple dimensions (Kim, Zhang, & Li, 2008). Participants evaluated two products—one designed to appeal to low-level construal and the other to high-level construal. They did so after receiving cues to instantiate temporal distance, social distance, both dimensions of distance, or neither (psychological proximity for temporal and social distance). Ratings made by participants in the former three conditions were effectively identical, preferring the high- over low-level-consistent product, whereas the final condition deviated from the rest in evincing the opposite pattern. Thus, two instantiations of distance were equivalent to one in evoking high-level construal. The present investigation makes a distinct point to suggest an explanatory mechanism underlying these findings: People are less sensitive to additional instantiations of psychological distance after an initial instantiation, which is alone sufficient to evoke abstract mental representation.

Sensitivity to Distance

Research on construal level theory has established that the introduction of distance causes incidental or contextual aspects of targets to be discounted (Trope & Liberman, 2010). Because our studies have shown that distance causes (further) distance to be discounted, the evidence presented here may seem to imply that psychological distance is itself an incidental, low-level aspect of a situation. Indeed, if we conceptualize of distance as an incidental aspect of the decision situation (e.g., a 15-person span of social distance), Studies 3–7 may be framed as consistent with the account that initial distancing diminishes incidental factors. How-

[1] It is important here to distinguish probability from uncertainty. From the perspective of construal level theory, probability is a unidirectional dimension of psychological distance: The less likely a target is, the more distant or remote it is because there are fewer and fewer situations in which that target will be encountered. Thus, an event that has a 50% probability of occurring feels psychologically closer than an event with only a 1% probability of occurring, whereas uncertainty is greatest when the event has a 50% probability of occurring.

ever, this account confounds psychological distance and incidental features. According to construal level theory, only the incidental is discounted from a distal perspective and no single feature of a situation (e.g., distance) is necessarily and always either a high- or low-level aspect (Liberman & Trope, 2008; Trope & Liberman, 2010). What would happen, then, if a span of distance were framed as carrying high-level value? Construal level theory would predict an initial instantiation of distance instead to heighten, rather than diminish, sensitivity to it; this consideration awaits future empirical attention. Nevertheless, the results of Studies 1, 2, and 8 point to a separate mechanism whereby initial distancing directly reduces the subjective magnitude of other distances.

Having established subjective sensitivity to further distance as a mediator of our effect (Study 8), we may go one step further to consider potential precursors that influence such magnitude estimations. A recent investigation into spatial distance offers one possible explanation (Maglio & Trope, 2011). We presented participants with a line drawn on a piece of paper that was meant to represent the path to a grocery store in either a spatially proximal or distal location. They had to eventually measure the length of the line, but first generated the one-unit measurement scale they would use to perform this task. Relative to those in the proximal condition, participants in the distal condition created larger units with which to measure the line, which in turn mediated their relative tendency to underestimate the length of the line. Drawing upon the clutter effect, by which an increase in the distinct segments in a given span of space increases magnitude estimates of it (e.g., Krishna & Raghubir, 1997; Sadalla & Staplin, 1980), we concluded that spatial distance reduces the precision of measurement scale (see also Henderson, Fujita, Trope, & Liberman, 2006; Liberman, Sagristano, & Trope, 2002), explaining its effect of reduced magnitude estimation. This reduction in unit precision bears directly upon distance sensitivity, as people should be less sensitive to spans of distance that seem objectively smaller. By framing a given span of distance as psychologically distal, might people apply coarser measurement units to it, thereby diminishing its estimated magnitude and, in turn, its influence on related tasks? However, a similar logic could apply this unit-size account not exclusively to distance but to any estimated magnitude (e.g., measuring money in cents rather than dollars). Conversely, given the unique relationship among the dimensions of psychological distance, it remains possible that distance would exert a stronger influence on the scale applied to other distance than on that applied to nondistance aspects.

Still, we might consider other determinants of how people appraise cross-dimensional distance as a function of initial distance and how such determinants relate to measurement scale. Toward this end, it bears relevance to differentiate the present studies from past research in the tradition of construal level theory. Prior investigations explicitly manipulated one form of distance and found patterns of assimilation when participants were asked to infer the magnitude of an unknown distance from a different dimension (e.g., Bar-Anan et al., 2007; Fiedler et al., 2012; Stephan et al., 2011). Our studies showed evidence not of assimilation but rather of contrast, which we believe occurred because participants considered explicitly defined magnitudes of cross-dimensional distance. This additional distance always reflected an interval between a proximal and a distal point (e.g., receiving a monetary reward immediately vs. 3 months later, Study 3). Because the additional distance in all of our studies was a known interval between a proximal and a distal point, initial distancing might (automatically, congruently) make both points seem further away. For example, when considering a bank located at a greater spatial distance, it makes the money kept there seem temporally distant as well. Subsequently, when people consider two points in time (sooner vs. later), the initial spatial distancing causes those points to seem temporally distal, making them seem closer to each other and, as a result, causing the distance between them to seem smaller. Our studies assessed the impact on the interval between two such points and not the egocentric distance from those points on another dimension. The results, therefore, are not inconsistent with past research showing congruent relations and assimilation patterns among the distances. Nevertheless, further empirical investigation is needed to consider whether such automatic associations might underlie the effect of distance on sensitivity to further distance.

Prescriptive Implications

Sensitivity to psychological distance can affect important judgments and decisions that carry relevance beyond the lab. Research from both psychology and behavioral economics consistently points to the practical consequences of failing to delay desired outcomes (Ainslie, 1975; Angeletos, Laibson, Repetto, Tobacman, & Weinberg, 2001; Baumeister, Heatherton, & Tice, 1994; Frederick et al., 2002; Laibson, 1997; Loewenstein & Elster, 1992; Mischel, Shoda, & Rodriguez, 1989). By opting to sacrifice an objectively superior reward in the interest of receiving any reward sooner, people succumb to suboptimal choices that compromise a broad scope of well-being (e.g., Bickel & Marsch, 2001; Logue & Anderson, 2001; Rachlin, 1995). Because several accounts for this phenomenon implicate the delay to the superior reward as looming too large to endure, means by which to temper the subjective magnitude of such delays may help to remedy poor financial decision making.

The research presented here offers a promising avenue by which to achieve this result: the introduction of an initial dimension of psychological distance. Beyond strictly temporal distance, our results support the contention that initial spatial, probabilistic, or social distance would reduce cross-dimensional sensitivity to the time delay to a larger reward, in turn facilitating superior decisions. For example, perhaps people structuring their retirement plans should deliberately store their money in geographically remote (but electronically accessible) bank accounts. Furthermore, as suggested by Study 4, we might conceptualize economic tradeoffs not strictly as small soon versus large later but instead as small close versus large further, whereby people choose between an objectively superior but psychologically more remote reward or an inferior, proximal reward. Again, our findings suggest that the introduction of any psychological distance would reduce sensitivity to this proximal/distal distinction and, in so doing, elicit a stronger preference for optimal choices. In an application of this prediction, perhaps the certainty effect (heightened sensitivity to especially strong probabilities, Kahneman & Tversky, 1979) would prove weaker following the introduction of time, space, probability, or social distance. If such distancing could give rise to decisions carrying larger expected values (e.g., especially large

payoffs with only somewhat lower odds), it could be offered as a route to enabling more objectively rational decisions.

Conclusion

The research presented here speaks to the tempering influence of psychological distance on further psychological distance. Nine studies offered evidence for this proposition using a series of different judgment and decision tasks. By representing a target as far away, extra distances are rendered less influential than when they exist nearby. Or, to return to the example with which we began, maybe Aunt Helen should push for an out-of-state wedding if she hopes to be considered socially close enough to the engaged couple to make the cut of invitees.

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Received June 22, 2011
Revision received August 22, 2012
Accepted August 27, 2012 ■