

Similar Psychological Distance Reduces Temporal Discounting

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Abstract

People often prefer inferior options in the present even when options in the future are more lucrative. Five studies investigated whether decision making could be improved by manipulating construal level and psychological distance. In Studies 1a, 1b, and 2, temporal discounting was reduced when future rewards (trips to Paris) were construed at a relatively concrete level, thus inducing a similar level of construal to present rewards. By contrast, Studies 3 and 4 reduced temporal discounting by making present financial rewards more psychologically distant via a social proximity manipulation, and thus linked to a similar high level of construal as future rewards. These results suggest that people prefer the more lucrative option when comparing two intertemporal choices that are construed on a similar level instead of on a different level. Thus, changes in construal level and mental representations can be used to promote more desirable choices in economic decision making.

Keywords

construal level theory, psychological distance, temporal discounting, intertemporal choice, economic decision making

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Every day we face many decisions, ranging from relatively ordinary choices such as whether to abide by a diet plan or grab a chocolate bar, to life-altering decisions such as whether to take a job offer or continue studying. Important decisions usually require thinking and planning beyond one's present situation. Indeed, a remarkable function of the human mind is that it allows imagining oneself in a different time and space, or in another person's position, thus enabling judgments and decisions beyond the self and the present. However, people often make suboptimal decisions, in terms of neoclassical economic theory, when dealing with the self in a future time. Many people prefer a smaller reward now to a large reward next year, and generally value options in the future less even when they are more lucrative than options in the present. This phenomenon is referred to as "temporal discounting," and the further away the future option, the more it tends to be discounted (Ainslie, 1992; Frederick, Loewenstein, & O'Donoghue, 2002; Green, Fristoe, & Myerson, 1994; Schelling, 1984; Thaler & Shefrin, 1981). Understanding why people discount future options is important because it can help us design strategies to improve intertemporal decision making for better long-term outcomes.

Although several explanations for this behavior have been suggested, our focus is on how different time points are cognitively construed and how manipulating these construals might promote more optimal decision making. Building on Construal Level Theory (CLT; Trope & Liberman, 2003), we investigate the possibility that more farsighted decisions can be encouraged by making the level of construal across

different time points more similar. Usually the present is associated with a concrete, incidental, and situated construal (i.e., low level), whereas the future is associated with an abstract, decontextualized construal (i.e., high level; Trope & Liberman, 2003), and it may be this difference that drives the discounting of future options. If true, encouraging either (a) the present and the future option to be construed at a low level or (b) the present and the future option to be construed at a high level should result in less future discounting, and therefore more adaptive decisions.

A key aspect of CLT is that it spans many different dimensions of "psychological distance." Time is one such dimension, and social distance is another: People close to us whom we know well are construed at a relatively low level, whereas people far from us with whom we are less familiar are construed at a relatively high level (Stephan, Liberman, & Trope, 2011). Importantly, and in contrast to some earlier work, our thesis is not based on the proposition that one kind of construal (i.e., high level) necessarily is associated with optimal decision making relative to another (i.e., low level). Rather, our aim is to test the possibility that decisions can be

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enhanced by ensuring that the options are presented at similar levels of construal, whether high or low.

Theoretical Account of Discounting

A number of—not necessarily mutually exclusive—explanations for temporal discounting have been proposed. First, it might occur because the future is uncertain and people prefer certain to uncertain options (Kahneman & Tversky, 1979): Getting the money now is more certain than getting it in 1 year, because many unforeseeable things might happen in the meantime. Consequently, temporal discounting may be a way to cope with the uncertainty of future rewards (Baron, 2000). Supporting this possibility, evidence suggests that people make more rational choices for certain future events than for hypothetical future events (Peters & Büchel, 2010).

Second, people may view their present and future selves quite differently. Indeed, one's future self is often represented in the same way as other people, for example, by attributing more observer-like than actor-like characteristics (Pronin & Ross, 2006), and people often make future decisions as if they were making them for somebody else rather than themselves (Pronin, Olivola, & Kennedy, 2008). Indeed, the more similar people view their current selves to their future selves, the less temporal discounting they show, because a future self as a continuum of the present self appreciates a greater reward more than a disconnected future self does (Bartels & Rips, 2010).

However, events in the future are not only uncertain and possibly unconnected from one's present situation, but they are also thought of in a more abstract, decontextualized way (Wakslak, Trope, Liberman, & Alony, 2006). In general, when a state or situation is not directly experienced, it is psychologically distant and involves cognitive representations that are abstract, schematic, and broad (Trope & Liberman, 2003). Thus, for future events, uncertainty and abstract thinking go hand in hand, and this might be critical for temporal discounting: The immediate reward is construed at a concrete, certain level, whereas the future reward is construed on an abstract, uncertain level, with decision makers eventually comparing apples and oranges, leading to suboptimal outcomes. Given the importance of the approach to our rationale, we outline CLT in more detail below.

CLT

Trope and Liberman (2003) proposed that psychological distance involves different mental representations of events, such that the distant future involves high-level construals that are abstract, decontextualized, and removed from direct experience, whereas the here and now involves low-level construals that are concrete and grounded in physical and perceptual experience. Psychological distance is composed of several domains: temporal (present vs. past/future), social (self vs. other), spatial (close vs. far), and hypothetical (certain vs.

probable) distance (Lieberman, Trope, & Stephan, 2007), and these domains can operate interdependently, suggesting a single underlying cognitive mechanism (Bar-Anan, Liberman, Trope, & Algom, 2007; Fiedler, Jung, Wänke, & Alexopoulos, 2012; Trope & Liberman, 2010). Much research also has shown that the level of psychological distance and its corresponding construal level influence each other in a bidirectional fashion (Fujita, Henderson, Eng, Trope, & Liberman, 2006; Liberman, Trope, McCrea, & Sherman, 2007; Stephan, 2004).

Accumulating evidence suggests that people make judgments and decisions differently depending on construal level. Psychological distance is associated with abstract thought and the use of general, holistic processing in various attribution and judgment tasks (e.g., Henderson, Fujita, Trope, & Liberman, 2006; Williams & Bargh, 2008). For example, high-level construal encourages global processing in perceptual tasks, whereas low-level construal encourages local processing (Förster, 2009; Liberman & Förster, 2009). High-level construal also boosts creative solutions more than low-level construal does (Förster, Friedman, & Liberman, 2004). Simple priming with words associated with distance, as opposed to closeness, also increases participants' preference for describing activities regarding their abstract ends rather than concrete means (Smith & Trope, 2006; Wakslak et al., 2006).

In decision making, high-level construals lead people to make more self-controlled decisions compared with low-level construals (Fujita & Han, 2009; Fujita & Roberts, 2010; Fujita, Trope, Liberman, & Levin-Sagi, 2006). For example, high-level construal involves thinking about temptations in more negative terms (Fujita et al., 2006), leads participants to favor advertisements appealing to their desired self-concept (Freitas, Langsam, Clark, & Moeller, 2008), and prefer distant to near future options (Trope & Liberman, 2000). Trope and Liberman (2000) observed participants' preference changes in future decision making and found that temporal distance increased participants' tendency to choose based on high-level characteristics. For example, when participants rated the attractiveness of a job offer in the distant future, they focused more on the general description of the job (i.e., how interesting it was) whereas the attractiveness for a near future job was based on the description of specific aspects of the job (i.e., how appealing the training was).

With relevance to the current research, previous work showed that an abstract, high-level mind-set reduces temporal discounting (Malkoc, Zauberman, & Bettman, 2010; Rogers & Bazerman, 2008). For example, Malkoc et al. found that people choose to wait a few days longer to save a delivery fee when consumer products are described in a more abstract manner as opposed to a concrete manner. Similarly, Rogers and Bazerman (2008) observed that when deciding on a distant future event, people make choices that serve their desired self, whereas focusing on a near future event makes people follow the current self's need.

Overview of the Current Research

Whereas previous studies have focused on the association of high-level construal with more self-controlled, adaptive decisions, the current research concentrated on the difference or mismatch of construal level in choice alternatives when choosing between two intertemporal options. That is, we propose that temporal discounting is due to two options being represented in a dissimilar manner (i.e., one at a low-level construal and the other at a high-level construal), thus making it difficult to compare intertemporal options directly.

In the present series of studies, we explored whether a similar level of construal might lead to more adaptive financial choices.¹ Construal differences between two rewards might be responsible for people favoring the immediate reward because “here and now” is likely to be represented concretely, whereas “there and then” is likely to be represented abstractly. Thus, people should be able to compare two intertemporal options more effectively when using similar construals and therefore prefer the larger future reward.

We assume that the more detailed information is available, the more people can construe a future event in a concrete way, corresponding to a low construal level. In contrast, when only brief and general information is provided, the quality of imagination becomes abstract and general, corresponding to a high-level construal. Therefore, by providing detailed information, we should be able to shift people’s perspective from what is in the future to what is here and now. Similarly, by giving abstract and decontextualized information, people’s perspective should change from here and now to a psychologically distant perspective. Thus, we tested whether construal-level change leads to more similar representations of intertemporal rewards, which should result in more rational choices.

In five studies, we manipulated construal-level and associated psychological distance and investigated their influence on intertemporal choices. We hypothesized that when two intertemporal rewards share a similar level of construal, the different options become more comparable, and thus, temporal discounting is reduced. Because inductions of abstract versus concrete processing have been previously shown to influence construal level (e.g., Liberman, Trope, & Stephan, 2007; Trope & Liberman, 2003, 2010), Studies 1a, 1b, and 2 consisted of manipulations of construal level, thus following Spencer, Zanna, and Fong’s (2005) suggestion of a “moderation-of-process” design for situations in which a proposed mediator is difficult to measure but easy to manipulate. In contrast to these tests of the path from construal level, the presumed mediator underlying psychological distance, to temporal discounting, Study 3 then measured, and Study 4 manipulated, psychological distance. In other words, these latter studies investigated the direct path from psychological distance to temporal discounting.

Study 1A: Making the Future More Concrete: Paris Hotels

In Study 1a, we tested temporal discounting after manipulating construals of *now* and *later* options in hypothetical scenarios so that they were both construed in a relatively concrete way. For the control condition, we used a standard temporal discounting procedure of monetary reward as used previously (Critchfield & Kollins, 2001). The amount of the delayed reward was held constant to be “in 1 year,” whereas the immediate reward decreased in size, such that there was a decision point at which participants switched when the immediate reward was too small to be preferred to the larger, delayed reward. In other words, this decision point identified the current subjective value of the “discounted value,” defined as the magnitude of the immediate reward that generates indifference in choice against the later reward. For this control condition, we expected people to show previously observed temporal discounting, because relative to the immediate reward that is construed concretely, the future reward is construed abstractly. In contrast, for the experimental condition, we intended to make the construal level for the future reward more similar to the immediate reward, by giving participants the opportunity to concretely imagine the future option: Participants were presented with a hypothetical future event, namely a trip to Paris that varied regarding the quality of the included accommodation, with the future option being more desirable than the immediate option. Thus, participants were able to directly compare the features of a specific imagined event in the *now* and *later* options, thus encouraging more adaptive choices relative to the control condition that dealt with decisions involving two distinct construal levels. In other words, we expected that participants would be more willing to wait for the larger reward when both choices were relatively concrete.

Method

Participants. Seventy participants (33 men; M age = 25.47, SD = 6.80) were recruited from the Cambridge central library and the University College London Union area. Participants were approached individually and given a brief paper-and-pencil survey with no monetary compensation. Half of the participants were randomly assigned to the control condition, the other half to the experimental condition.

Materials and Procedure

Intertemporal choice. To keep the two conditions as similar as possible, each involved a check or voucher that could be exchanged for a reward (i.e., money or a trip to Paris) and could be received either now or in 1 year’s time. Thus, in principle, either condition involved being able to experience the reward immediately or later. For the Control condition, participants made a choice between two options: receiving a £500 check in 1 year or receiving a slightly less valuable

check right now, and the *now* options decreased in £40 decrements from £460 to £260. The following instructions were given to participants:

Imagine somebody were to give you a check and offered you two choices: Either you receive it *right now*, or you receive it in *1 year from now*. Imagine that the check can be cashed at any time once you have received it. Please make this choice for six different scenarios.

For the experimental condition, participants made a hypothetical choice between receiving a £500 travel voucher in 1 year or receiving a slightly less valuable travel voucher right now. The following instructions were given to participants:

Imagine somebody were to give you a travel voucher for a holiday in Paris and offered you two choices: Either you receive it *right now*, or you receive it in *1 year from now*. Imagine that the voucher can be used at any time once you have received it. Please make this choice for six different scenarios.

Vouchers for Paris trips were varied by including accommodation, for example, from five-star hotel suite (for a £500 voucher), five-star hotel (for a £460 voucher), four-star hotel (for a £420 voucher), and so on to a £260 voucher that did not include any accommodation. To help participants actively simulate the future reward, we added color pictures of the accommodation corresponding to the value of each travel voucher.

Results

Discounted values for receiving £500 in 1 year were computed by averaging the switch point in descending choice sequences for *now* options. For example, if a participant preferred receiving £380 now to receiving £500 in the future, but was unwilling to receive £340 now and decided to wait for £500 in the future, the discounted value was £360. If participants decided to always take *now* options or *later* options, the discounted value was calculated by averaging the lowest (i.e., £260) or highest *now* option (i.e., £460) on the survey with the hypothetically lower (i.e., £220) or higher (£500) option, which resulted in £240 or £480, respectively. Mean discounted values were compared in a one-way ANOVA with condition (control vs. experimental condition) as factor. As expected, there was a significant main effect for condition: Discounted values were higher in the experimental condition ($M = 395.43$, $SD = 73.10$) than the control condition ($M = 354.29$, $SD = 73.34$), $F(1, 68) = 5.53$, $p = .02$, $\eta_p^2 = .08$, indicating that people were more willing to wait for the larger reward under similar level of construals.² To compare effects across studies, we also calculated the percentage of reduction in discounting by first multiplying the mean difference between conditions by 100, then dividing it by the mean of the experimental condition. This showed that relative to the control condition, the experimental condition showed 10.4 % less temporal discounting.

Discussion

As hypothesized, participants were more willing to wait for the larger reward in the future when two intertemporal options were both represented on similarly concrete levels of construal, compared with participants who made choices between dissimilar levels of construal: The average participant in the control condition was willing to accept a reward worth about £350 right now, whereas the average participant in the experimental condition was not willing to accept any less than about £390. Presumably, participants in the experimental condition were able to more clearly imagine what it would be like to spend a holiday at a fancy hotel in Paris in the future due to the concrete construal level. Therefore, participants were able to compare the *now* and *later* options on a similar type of representation that enabled a more direct comparison, which in turn reduced their temporal discounting.

Study 1B: Making the Future More Concrete: Paris Attractions

Although the results of the first study provided evidence for our hypothesis, there was a potential confound because photos were shown for the holiday condition but not for the control condition. Thus, the use of pictures may have encouraged more concrete imagery, and therefore reduced temporal discounting. We therefore removed the photos in Study 1b. To provide participants with opportunities for concrete construals that were not based on photos, details about a hypothetical trip to Paris were given that described specific tourist attractions (e.g., Eiffel tower, boat trip on the Seine), and different choices included different numbers of attractions. Thus, rather than exposing participants to preexisting stimuli, participants were able to concretely imagine specific events they personally could experience in Paris, and the number of these experiences varied in a linear fashion. Furthermore, we added a manipulation check to measure imagery complexity by asking about detail of the imagery and interest of going on a trip to Paris. Because a concrete mind-set might lead participants to spend more time considering the decision and thus be confounded with construal level, we also asked participants to indicate the time spent on thinking about the given future event.

Method

Participants. Eighty-one participants (39 men, M age = 23.60, $SD = 6.29$) were recruited from the Cambridge central library and University College London Union and tested in the same manner as in Study 1a.

Materials and Procedure

Intertemporal choice. The survey was identical to Study 1a, except that instead of hotel photos, the numbers of Paris attractions varied for the experimental condition. A list of six

attractions was specified under the title of “Paris attraction package” (e.g., a dinner for two at the restaurant at the top of the Eiffel tower). The number of attractions depended on the value of each travel voucher, for example, a £500 voucher including all six attractions, a £460 voucher including five attractions, and so on, with no attractions included in the £260 voucher.

Manipulation check. To check whether participants imagined the future option more concretely in the experimental condition compared with the control condition they indicated in how much detail they thought of the given future event, from 1 (*not much detail at all*) to 7 (*very much detail*). Furthermore, participants in the experimental condition indicated how interested they would be in going to Paris from 1 (*not interested at all*) to 7 (*very much interested*).

Potential confound: Imagery length. To assess whether participants in the experimental condition might have considered the potential trip to Paris not only in more detail but also for a longer time, participants indicated for how long they had thought of the potential future trip to Paris, or the event of receiving the check from 1 (*not long at all*) to 7 (*very long*).

Results

Temporal Discounting. A one-way ANOVA with Condition (experimental vs. control) revealed a significant difference in discounting: Participants made more adaptive choices in the experimental condition ($M = 434.00$, $SD = 71.07$) than in the control condition ($M = 385.37$, $SD = 79.38$), $F(1, 79) = 8.43$, $p = .005$, $\eta_p^2 = .10$. This effect represented a reduction of temporal discounting by 11.21%.

Manipulation Check. A one-way ANOVA showed that participants in the experimental condition ($M = 3.58$, $SD = 1.82$) imagined the future event in more detail than the control condition ($M = 2.77$, $SD = 1.59$), $F(1, 79) = 4.51$, $p = .04$, $\eta_p^2 = .05$. Furthermore, a significant positive correlation emerged between discounted value in the experimental condition and their interest score, $r(40) = .32$, $p = .04$ (two-tailed), indicating that the more participants were interested in going on a trip to Paris in the future, the more they were willing to wait for the superior hotel voucher. No other correlations showed statistical significance.

Potential Confound: Imagery Length. Participants in the experimental condition ($M = 3.40$, $SD = 1.74$) spent significantly longer thinking about the future event than the control condition ($M = 2.50$, $SD = 1.37$), $F(1, 79) = 6.73$, $p = .01$, $\eta_p^2 = .08$. To test whether imagery length might have contributed to the observed effect, we added imagery length to the main analysis as a covariate. The main effect of condition remained significant, $F(1, 78) = 6.87$, $p = .01$, $\eta_p^2 = .08$, and there was no

effect of the covariate ($p = .59$), thus suggesting that imagery length did not account for the finding.

Discussion

As found in Study 1a, participants were more willing to wait for the greater reward when *now* and *later* options were represented on a relatively concrete level of construal. In other words, participants required greater compensation in the present for foregoing a £500 holiday in the future than they required for foregoing a £500 check in the future. In this study, rather than presenting participants with specific pictures to aid mental simulation, they were given the opportunity to come up with subjective concrete construals of future events. Despite this difference, the effect was the same. Furthermore, participants in the experimental condition reported that they thought about the future event in more detail compared with the control group, indicating that we successfully induced a more concrete level of representation.

Study 2: More or Less Concrete Trips to Paris

The findings from the first two studies suggest that when participants formed a relatively concrete representation for *now* and *later* options, they made more financially beneficial choices than participants who compared *now* and *later* options on relatively different levels of construal. However, we must consider the possibility that the condition involving the check might have differed in other respects from the condition involving the Paris trip voucher, regardless of construal level. For example, being presented with a potential trip to Paris might have involved positive valence, or induced a positive mood, which in turn could have influenced participants' decision making. Therefore, Study 2 assessed temporal discounting by comparing two conditions that involved a travel voucher to Paris. The only difference between conditions was the level of detail and concreteness regarding the Paris trip, with the experimental condition being provided with concrete details about the trip, whereas the control condition receiving no such details. We further not only excluded items to check the effectiveness of the manipulation but also included additional items regarding potential confounds, such as interest in going to Paris and enjoyment thinking about it, and participants' current mood.

Method

Participants. One hundred and two U.S. citizens (35 men, M age = 36.25, $SD = 13.70$) participated in an online study on choice making, which was posted on Amazon's Mechanical Turk (MTurk), an online interface shown to provide reliable, high-quality data (Buhrmester, Kwang, & Gosling, 2011). Participants were paid \$0.20 each. One participant did not

provide answers for the manipulation check and confounds, and therefore contributed incomplete data.

Materials and Procedure. Instructions were similar to the ones used for the experimental condition in Study 1b, but participants completed the study as an online survey.

Intertemporal Choice. Participants made an intertemporal choice concerning a Paris trip voucher by clicking the box of which option they preferred between *now* and *later* options. For the experimental condition, participants were presented with options that entailed a list of Paris attractions identical to Study 1b. For the control condition, participants were only informed that the voucher was for a trip to Paris, and no attractions were described.

Manipulation Check. After participants completed the intertemporal choice, they reported on imagery detail and how easily they visualized themselves in Paris (1 = *not easily at all* to 7 = *very easily*).

Potential Confounds: Imagery Length, Interest, and Mood. In addition to assessing imagery length and interest in going to Paris as in Study 1b, we further asked how much participants enjoyed thinking about going to Paris (1 = *not at all* to 7 = *very much*), and how happy (1 = *not happy at all* to 7 = *extremely happy*) and how excited (1 = *not excited at all* to 7 = *extremely excited*) they felt at the moment.

Results

Temporal Discounting. A one-way ANOVA with Condition (experimental vs. control) revealed a significant difference in discounting: Participants made more adaptive choices in the experimental condition ($M = 440.00$, $SD = 56.57$) than in the control condition ($M = 413.33$, $SD = 65.93$), $F(1, 100) = 4.75$, $p = .03$, $\eta_p^2 = .05$. Therefore, the temporal discounting was reduced by 6.06%. A marginally significant negative correlation emerged between discounted value and how easily participants could visualize themselves in Paris, $r(101) = -.18$, $p = .07$ (two-tailed), indicating that participants who went for the immediate reward could visualize themselves in Paris more easily.

Manipulation Check. A one-way ANOVA showed that participants in the experimental condition ($M = 4.90$, $SD = 1.46$) imagined the future event in more detail than the control condition ($M = 3.69$, $SD = 1.78$), $F(1, 99) = 13.65$, $p < .001$, $\eta_p^2 = .12$. There was no difference in how easily participants visualized themselves in Paris, $p = .55$.

Potential Confounds: Imagery Length, Interest, and Mood. Because participants in the experimental condition ($M = 4.23$, $SD = 1.45$) reported spending significantly longer thinking about the future event than the control

condition ($M = 3.17$, $SD = 1.70$), $F(1, 99) = 11.34$, $p = .001$, $\eta_p^2 = .10$, we added imagery length as a covariate to the main analysis. The previously observed effect remained significant, $F(1, 98) = 4.08$, $p = .05$, $\eta_p^2 = .04$, with no effect on the covariate ($p = .88$).

Conditions did not differ regarding how much participants enjoyed thinking about going to Paris (control condition: $M = 5.50$, $SD = 1.50$ vs. experimental condition: $M = 5.74$, $SD = 1.34$), $F(1, 99) = 0.73$, $p = .39$, or how interested participants were in going there (control condition: $M = 5.98$, $SD = 1.47$ vs. experimental condition: $M = 6.04$, $SD = 1.20$), $F(1, 99) = .05$, $p = .82$. Mood analyses revealed that participants in the experimental condition ($M = 5.11$, $SD = 1.11$) did not differ from those in the control condition ($M = 4.91$, $SD = 1.56$) in how happy they felt at the moment, $F(1, 99) = .53$, $p = .47$. Likewise, participants' excitement in the experimental condition ($M = 4.43$, $SD = 1.46$) did not differ from the control condition ($M = 4.09$, $SD = 1.75$), $F(1, 99) = 1.06$, $p = .31$.³

Discussion

Study 2 ruled out the possibility that the effects regarding temporal discounting that we observed in the earlier studies might have been due to differences in the tasks rather than construal level, or other factors such as interest in going to Paris or the time spent thinking about going there. Participants made more financially advantageous decisions when the tasks were identical across conditions, and only differed in the detail and concreteness of the future experience. Furthermore, positive mood did not differ across conditions, indicating that how happy or excited participants felt while imagining a trip to Paris did not influence their choices.

Although Studies 1a, 1b, and 2 demonstrated that temporal discounting could be reduced by making intertemporal choices more concrete, temporal discounting should also be reduced when intertemporal choices are made less concrete: The same effect should occur when *now* and *later* options are construed on an abstract level as a consequence of increased psychological distance. Importantly, this would suggest that no type of construal is necessarily preferable, because similarity in construal level should help people make more adaptive choices regardless of whether the two intertemporal options are construed in a concrete or an abstract fashion. Thus, in the next two studies we tested whether increased psychological distance would be associated with reduced temporal discounting, because *now* and *later* options can be construed on a similarly high construal level.

Study 3: Intertemporal Choices for Strangers

For Study 3, we assumed that with greater psychological distance, intertemporal options should be construed relatively abstractly. We induced a particular dimension of psychological distance, namely social distance, which reflects the

subjective closeness toward a target person, and can range from being very close for a very good friend to very distant for a stranger (Trope & Liberman, 2003). Similar attitudinal and behavioral consequences of temporal distance and social distance are evident in mounting research of CLT, thus supporting their functional equivalence (Pronin et al., 2008; Pronin & Ross, 2006; Trope & Liberman, 2003, 2010). In economic decision making, Jones and Rachlin (2006) observed that the closer participants felt to a social contact, the more money they decided to forgo when this person then benefited from that money. Interestingly, the amount of money that people decided to forgo decreased as a hyperbolic function with respect to social closeness, similar to the pattern observed in temporal discounting (Jones & Rachlin, 2006; Rachlin & Jones, 2008). Similarly, people were more willing to wait for a reward when the intertemporal choice was on behalf of a group to which participants belonged, compared with making the decision for themselves (Charlton, Yi, Porter, Carter, Bickel, & Rachlin, 2013).

We propose that increased social distance alleviates temporal discounting: Making an intertemporal choice for a psychologically distant target should involve a relatively abstract construal level, compared with a decision for oneself or for a socially close person, such as a best friend. Hence, when making a decision for the close contact, the *now* option should be represented in a relatively concrete way, whereas the *later* option should remain abstract due to the nature of intertemporal choice that entails temporal distance. In contrast, when making a choice for a stranger, the *now* option is no longer represented in a concrete way, due to the increased social distance that leads to representing present and future options in a relatively abstract way. We expected to observe more rational choices when *now* and *later* options were represented similarly in an abstract fashion, as would be the case when making the choice for a stranger, compared with when the intertemporal options were represented in a dissimilar fashion, as would be the case when making the choice for a friend.

For an initial test of this idea, we conducted a correlational study that related subjective closeness toward a target person to participants' temporal discounting. We predicted greater willingness to wait for the distant reward with increased social distance.

Method

Participants. Thirty participants (15 men; M age = 23.45, $SD = 4.90$) filled out a survey at the University College London Union area and were tested in the same manner as in Studies 1a and 1b. One participant was excluded due to failure to follow instructions.

Material and Procedure

Induction of social distance and intertemporal choice. Social distance was induced by applying the procedure developed by Jones and Rachlin (2006). Participants were given

instructions to imagine creating a list of 100 people closest to themselves, ranging from the dearest friend or family member at Position 1 to a mere acquaintance at Position 100. The identical intertemporal choices used in the control condition in Studies 1a and 1b were given to the participants; however, this time, all participants made decisions for the person at Position 100 rather than for themselves.

Subjective similarity and familiarity rating. After making intertemporal choices, participants answered two questions concerning the person for whom they made the choice, namely, how well they knew the person (1 = *not very well at all* to 7 = *very well*) and how similar the person was to them (1 = *not similar at all* to 7 = *very similar*).

Results

Based on participants' familiarity ratings ($M = 3.12$, $SD = 1.53$) and similarity ratings ($M = 2.81$, $SD = 1.57$), to test the hypothesis that people discount less for psychologically distant others we correlated participants' rating of how similar they rated themselves to the mere acquaintance (i.e., the person Position 100) with their discounted value. As predicted, this relationship was significantly negative, $r(29) = -.45$, $p = .02$ (two-tailed). That is, the greater the perceived psychological distance between participants and the target person, the more adaptive were their choices. Although the correlation between familiarity scores and discounted value was also negative, it was not significant, $r(29) = -.15$, $p = .45$.

Discussion

As predicted, the more distant the target was for whom participants made an intertemporal decision, the less temporal discounting they showed. That is, encouraging participants to form a high-level construal of the target person receiving the rewards encouraged adaptive choices. This study is particularly important for CLT because it shows, as the theory would predict, that manipulating construals on a different domain—social distance—has comparable effects to manipulating features of temporal distance seen in Studies 1a, 1b, and 2.

A limitation of Study 3 was that we used a correlational design so we were only able to demonstrate an association rather than causality. Consequently, in Study 4, we designed a between-subjects study that manipulated social distance experimentally by comparing intertemporal choices for a close versus distant social contact.

Study 4: Intertemporal Choices for Strangers or Best Friends

Method

Participants. Seventy-three participants (35 men; M age = 23.83, $SD = 7.57$) were recruited from the Cambridge central

library and the University College London Union area and tested in the same manner as in the earlier studies.

Materials and Procedure. The induction of social distance was identical to Study 3. Participants were asked to imagine the target person and make intertemporal decisions on behalf of that person, with half deciding for the stranger and the other half deciding for their closest contact. After making intertemporal choices, participants were asked the same two questions about closeness and similarity to the target person as in Study 3.

Results

Manipulation Check. The purpose of the experimental manipulation was to have the “closest person” as a target person in the friend condition and the “mere acquaintance” in the stranger condition. Three outliers were excluded from the friend condition because their “familiarity” ratings were 5 or lower, suggesting that participants actually did not know the person very well whom they listed as the closest person. One outlier was excluded from the stranger condition because the “familiarity” rating was 7, indicating that the participant knew the target person very well whom he or she thought of as a mere acquaintance.

A significant difference in the “familiarity” rating was observed for the friend condition ($M = 6.84$, $SD = 0.37$) compared with the stranger condition ($M = 2.49$, $SD = 1.10$), $F(1, 67) = 455.10$, $p < .001$, $\eta_p^2 = .87$. “Similarity” rating also differed significantly between the friend condition ($M = 5.22$, $SD = 1.43$) and the stranger condition ($M = 2.80$, $SD = 1.20$), $F(1, 67) = 58.70$, $p < .001$, $\eta_p^2 = .47$.

Temporal Discounting. A one-way ANOVA with condition (distant vs. close target) revealed significantly reduced discounting for the distant target ($M = 404.05$, $SD = 59.79$) compared with the close target ($M = 366.88$, $SD = 77.89$), $F(1, 67) = 5.02$, $p = .03$, $\eta_p^2 = .07$. Temporal discounting was reduced by 8.94% in the experimental condition compared with the control condition. In other words, participants showed a greater preference for the delayed, larger reward when acting on behalf of a stranger, which involved *now* and *later* options construed in an abstract, psychologically distant fashion, compared with when making the same choice for a close friend or family member.

Correlations. Similar to Study 3, participants’ discounted values were negatively correlated with their “similarity” ratings, $r(69) = -.28$, $p = .02$ (two-tailed), and “familiarity” ratings, $r(69) = -.27$, $p = .03$ (two-tailed). Thus, the closer participants felt to the target person, the less they were willing to wait for the greater reward.

Discussion

In Study 4, we found that inducing psychological distance by asking participants to make decisions on behalf of a stranger

reduced temporal discounting: Relative to making intertemporal choices for a psychologically close person, namely, a close friend, making choices for a stranger led to more rational decisions. It is noteworthy that our findings show a consistent pattern of reduced temporal discounting due to construal level change throughout the studies. Participants’ data in Study 4 closely resembles those observed from Studies 1a, 1b, and 2, but this time, we manipulated social distance rather than construal levels relating to temporal distance.

General Discussion

Researchers have been fascinated by the conflict between the “want” or “passionate” option and the “should” or “rational” option (for a review, Milkman, Rogers, & Bazerman, 2008). A big puzzle emerging from this work has been why people sometimes fail to make optimal economic decisions although they are capable of doing so. However, the field of decision making has often focused on descriptions of erroneous decisions rather than how such errors could be avoided (Milkman, Chugh, & Bazerman, 2009). The current research proposes a potential solution of coping with decision-making errors. We suggest that suboptimal decisions can be improved by changing psychological distance because it modulates construal level: A low construal level involving proximate psychological distance encourages mental simulation to be contextually rich and vivid, whereas a high construal level involving distant psychological distance lacks such characteristics. Dissimilar levels of construal for representing a single situation might lead to suboptimal decisions. For example, intertemporal choices that compare psychologically proximate (i.e., *now*) and psychologically distant (i.e., *later*) options generate discrepancy in mentally representing two alternative scenarios. Consequently, an individual might discount future rewards not because they fail to “do the math” or are risk averse but because they fail to form a concrete representation of the positive future outcome. We considered such a mismatch of representation as the key to improving intertemporal choices, and hypothesized that when *now* and *later* options are compared on a similar level of construal, participants would make more adaptive decisions, regardless of whether both levels of construal are high or low.

Indeed, the results observed from five studies suggest that it is possible to manipulate intertemporal choice depending on how similar construal levels are when choosing between two alternatives: When two intertemporal options (*now* and *later*) shared a similar level of construal (either both concrete, or both abstract), people made more financially lucrative decisions across time: When *now* and *later* options were construed concretely (Studies 1a, 1b, and 2) people discounted less. Similarly, when two options were construed abstractly due to increased psychological distance (Studies 3 and 4) people discounted less. In short, our studies support the notion that temporal discounting may be due to the construal level difference of near versus far future options.

Interpreting Intertemporal Choice in the Framework of Psychological Distance

Previous research on intertemporal choice has supported the view that high-level construal helps people make more rational and controlled decisions (Malkoc et al., 2010; Rogers & Bazerman, 2008). Such studies assume that the value regarding the future or desired self (i.e., “should” self) involves high-level construals, and that representing a given situation under high-level construals leads people to make more future-oriented and adaptive choices. Research supporting this idea stresses characteristic features of optimal decision making that are often associated with high construal level such as patience and rationality, and by priming a high construal level, people are more likely to choose the desirable option corresponding to such values.

In contrast, the current research suggests that a high construal level may not always be beneficial, but comparing choice alternatives using a similar construal level can lead to adaptive choices, because people are able to realize choice consequences more clearly. Indeed, recent research on construal level emphasizes that a low or high construal level is not necessarily better or worse, but that their fit is critical (e.g., Ledgerwood & Trope, 2010). Studies have demonstrated that not only goals related to high-level values but also specific behavior guidance under low-level construals can boost task performance because high-level values can be broken down into concrete behavior, which in turn can help people achieve their goals. Such studies highlight the importance of fit rather than the specific level of construal. Likewise, Giacomantonio, De Dreu, Shalvi, Sligte, and Leder (2010) stressed the role of comparability of construals regarding social motivation. That is, depending on participants’ motivational state (i.e., pro-social or pro-self), cooperative or competitive behavior was observed under low as well as high levels of construal. Thus, people do not always make better choices under high-level construals. This effect is consistent with previous research showing that when a fit exists between mental perspectives, information is processed more fluently (Lee & Aaker, 2004). Similarly, a fit between experiential and conceptual affective cues leads to better recall performance than when there is no such fit (Centerbar, Schnall, Clore, & Garvin, 2008). Therefore, improved intertemporal choice observed in the current study might be partly due to fluency caused by construal fit, enabling people to evaluate alternatives with less bias.

Our research is in line with evidence showing that concreteness in describing a future event can increase its subjective certainty of occurring (Gollwitzer & Brandstätter, 1997; Sherman, Zehner, Johnson, & Hirt, 1983). In Studies 1a, 1b, and 2, we described future events with more concrete and contextualized terms as opposed to describing an abstract sum of money. Our intention was that participants would imagine what they would be missing if they were to choose an immediate reward. That is, a detailed description of the

now and the *later* options enabled participants to compare them in a more precise and clear way. Indeed, previous research showed that an event that is described in a detailed rather than an abstract way increased subjective likelihood judgments that the event might actually happen (Sherman et al., 1983). Similarly, future plans that use more concrete terms referring to how, when, and where the activity would take place are more likely to be implemented compared with plans described with abstract and general terms (Gollwitzer & Brandstätter, 1997). In other words, although temporally distant events are likely to be represented in abstract and general terms, once described in a detailed and contextualized way, these mental representation change as if the event were to take place in the more immediate future. In this way, the *later* option might receive more weight in intertemporal decision making. However, because the future outcomes are often underweighted due to temporal discounting, overweighting the *later* option might help balance the overall decision weighting when deciding between two alternative intertemporal options.

One possible criticism of our work may be that although we hypothesize that construal level and psychological distance were the key variables underlying the observed effects, perhaps confounding variables led to the findings. Although the original effects in Studies 1b and 2 did not change once we took into account potential confounds such as imagery length or mood, it is conceivable that the manipulations of construal level might have also changed variables that we did not measure. However, we believe that although each study might have involved possible confounds, we cannot think of a single variable that could explain the pattern of all the different studies collectively. For example, although it is possible that participants who were in the concrete condition in the first three studies might have thought about their response option more deeply, or engaged with it more, this in itself could have led to *less* temporal discounting. However, such an argument would predict the opposite to what we found in Studies 3 and 4: Because close psychological distance such as thinking about a close friend rather than a distant acquaintance is associated with a relatively concrete representation, one could have equally predicted less temporal discounting, but there actually was *more* discounting for friends than for strangers. The only common mechanism across all studies is psychological distance and associated construal level, and this is indeed the novel contribution of our work.

Psychological Distance and Economic Decision Making

Our findings suggest a possible integration of existing research on intertemporal choice using the framework of CLT. In previous studies, the cause of temporal discounting was that the future had been perceived as uncertain (Baron, 2000), detached from the present self (Bartels & Rips, 2010), and free from empathetic feelings (Loewenstein, Prelec, &

Shatto, 1998). We suggest that such types of representation relate to the consequences of psychological distance. As discussed in the introduction, the future is psychologically distant and induces high-level construals characterized by an abstract, general, and decontextualized mind-set. We argue that because of this high-level construal, future rewards are seen as less certain and detached from one's currently experiencing self, and as a result, people discount future rewards. Therefore, the notion of psychological distance and corresponding construal level can serve to unify existing findings on temporal discounting.

One of the benefits of such an integrative framework is that psychological distance can be manipulated in various ways. As discussed earlier, psychological distance shares its mechanism across various dimensions such as temporal, social, spatial, and hypothetical distance. Therefore, although one dimension might be fixed, for example, at a specific time, manipulating another dimension, such as social distance, can lead to similar results as if temporal distance had been changed. Indeed, across four experiments, temporal discounting was reduced by 10.40%, 11.21%, and 6.06% for the temporal distance experiments and by 8.94% for the social distance experiment in the experimental conditions compared with the control conditions, suggesting that the findings are comparable when social distance was induced to make two intertemporal points seem distant.

Our theoretical approach suggests that manipulating construal level might also improve various other types of decision making. For example, phenomena observed in behavioral economics such as loss aversion (Kahneman, Knetsch, & Thaler, 1990) might similarly be influenced by changes in construal level. The fact that people are more sensitive to losing than gaining might depend on how easily they can simulate gainful or costly situations. People might avoid costly events that seem psychologically close more than those that seem distant. Likewise, the value of an object might seem higher once it has been owned compared with when owning it is just imagined, which has been termed the endowment effect (Thaler, 1980). This effect might be due to the fact that direct physical contact helps people actively simulate what it means to own and use the object, which in turn makes the valuable object appear more valuable, relative to merely considering owning and using it. If this were the case, the endowment effect could be counteracted by inducing people to construe the object in abstract terms, similar to the methods used in the current studies. Finally, inducing psychological distance might help achieve greater profits when current emotional feelings get in the way of making economically beneficial choices. For example, in the Ultimatum Game (Güth, Schmittberger & Schwarze, 1982), participants reject unfair offers extended by an opponent although this incurs a financial cost. People might be able to reduce such a cost when imagining that the offers were to be given at a later time, or by pretending to make decisions on behalf of another person.

Taken together, we propose that other biases in decision making alongside temporal discounting may stem from consequences of varying psychological distance. Thus, adopting suitable levels of construal could be highly beneficial when implemented in applied contexts.

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Notes

1. In our research, we consider a "good decision" to be one that maximizes the overall financial profit. Thus, "adaptive" or "rational" choices refer to those that help decision makers receive the highest possible monetary reward.
2. There was a roughly equal distribution of men and women in each condition in this experiment as well as in subsequent experiments. The same analysis was also conducted with gender as an additional factor. There was no significant effect for gender ($p > .11$), nor for the interaction of gender and condition ($p > .13$). Thus, gender was dropped as a factor. For all subsequent experiments, analyses involving gender were performed as well. However, because none of the effects were significant, they are not reported.
3. Although there were no differences across conditions, we added enjoyment of thinking of Paris, interest in going there, and current happiness and excitement as covariates into separate analyses. In no case was the original effect for temporal discounting reduced substantially (all $ps < .04$, all $\eta_p^2 > .04$), with no effect of any covariates (all $ps > .30$).

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