

## Temporal distance and ease of retrieval <sup>☆</sup>

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### Abstract

Construal Level Theory (CLT; Trope & Liberman, 2003) proposes that pro-arguments (pros) constitute high-level construals and counter-arguments (cons) low-level construals. Therefore, pros are more salient for distant-future actions than are cons and the reverse holds for near-future actions (Eyal, Liberman, Trope, & Walther, 2004). We further predicted and results from one experiment show that participants found it easier to generate pros if an action pertained to the distant rather than the near future. For cons the effect was reversed: participants found it more difficult to generate cons if the action pertained to the distant rather than the near future. Consequently, people were more in favor of the action if it pertained to the distant rather than the near future. Ease of retrieval mediated the effect of temporal distance on attitudes. The mutual relevance of the CLT framework and research on ease of retrieval is discussed. © 2006 Elsevier Inc. All rights reserved.

*Keywords:* Temporal distance; Construal level; Ease of retrieval; Attitudes

When people consider a future action they often think about pro-arguments (pros) and counter-arguments (cons). The outcome of their thoughts is likely to determine attitudes towards the action and related behavior. People are more likely to carry out the action if the pros outweigh the cons. Interestingly, the result of this mental exercise and therefore the attitudinal and behavioral consequences may differ depending on mere temporal distance to the action.

Construal Level Theory (CLT; Trope & Liberman, 2003) proposes that people create more abstract representations (high-level construals) of distant-future actions and more concrete representations (low-level construals) of near-future actions. According to CLT, high-level construals consist of general, abstract, simple, and decontextualized features that convey the essence of information about future actions, whereas low-level construals include more specific, concrete, complex, and contextual details of future actions. For example, high-level construals of a health cam-

aign could comprise individual health benefits and economical benefits for society through increased quality of life and reduced health insurance premiums. These high-level construals are related to the question of *why* one would want to implement a health campaign. In contrast, low-level construals of a health campaign could comprise the implementation costs and the organizational coordination efforts of the campaign. These low-level construals are related to issues of *how* to implement a health campaign.

### Construal level theory and attitude processes

Concerning attitude processes, CLT proposes that pro-arguments (pros) about an action constitute high-level construals and that counter-arguments (cons) constitute low-level construals (Eyal et al., 2004). Actions are thus construed more in terms of their pro-aspects if the actions pertain to the distant as opposed to the near future. Conversely, actions are construed more in terms of their con-aspects if the actions pertain to the near as opposed to the distant future. Experimental evidence is consistent with the mapping of pros to high-level construals and cons to low-level construals. Participants in Eyal and colleagues'

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studies were instructed to write down as many pros and cons as they wanted about either distant-future actions or near-future actions. They generated more pros (relative to the total number of pros and cons) when the actions pertained to the distant future than when they pertained to the near future. The more pros participants generated relative to the total numbers of pros and cons, the more favorable their attitudes and intentions were. Consequently, participants were more in favor of distant-future actions as compared with near-future actions. The fraction of pros relative to all generated arguments partially mediated the influence of temporal distance on attitudes and intentions (Eyal et al., 2004).

### The present experiment

The present research combines CLT (Trope & Liberman, 2003) with research on the role of ease of retrieval in the construction of attitude judgments (Schwarz, 1998; Schwarz, Bless, Wänke, & Winkielman, 2003; Wänke & Bless, 2000; Wänke, Bless, & Biller, 1996). Two main aspects are pursued: first, we suggest that temporal distance affects the ease of retrieval associated with generating arguments. Second, we suggest that ease of retrieval mediates the influence of temporal distance on attitudes.

We propose that because distant-future actions are primarily construed in terms of their pro-aspects it is easier to generate pros when the actions pertain to the distant future than when they pertain to the near future. Conversely, we propose that because near-future actions are primarily construed in terms of their con-aspects it is easier to generate cons when the actions pertain to the near future than when they pertain to the distant future. Thus, we predict that when the direction of arguments and the temporal distance match (pros/distant future and cons/near future) the generation of arguments will be easier than when they do not match (pros/near future and cons/distant future).<sup>1</sup> Research has shown that attitudes are more in line with the retrieved argument content when the retrieval is experienced as easy rather than difficult: people hold more favorable attitudes towards actions the easier it is to generate pros and the more difficult it is to generate cons (Wänke & Bless, 2000; Wänke et al., 1996). Thus, people should hold more favorable attitudes towards distant-future as compared with near-future actions, assuming the actions are desirable (see Eyal et al., 2004, for a discussion of the relationship between pros/

<sup>1</sup> Note that CLT (Trope & Liberman, 2003) predicts a *relative* difference in the prominence of high- and low-level construals for distant-future actions as compared with near-future actions. For example, a health campaign may be construed in terms of more pro-aspects than con-aspects in the distant as well as in the near future. Critically however, CLT predicts that the relative prominence of pros as compared with cons should be higher in the distant as compared with the near future. More generally, CLT predicts interaction effects and not necessarily simple effects, although the latter are consistent with CLT. However, for ease of reading we frame our interaction hypothesis in this paper as two simple effects.

cons and desirability/feasibility). Consequently, the ease of retrieval associated with generating pros and cons should mediate the influence of temporal distance on preferences and judgments.

Direct evidence for ease of retrieval mediating the influence of temporal distance on preferences and judgments has not yet been shown. However, the results of Eyal and colleagues' studies (Eyal et al., 2004) are consistent with this proposition. Note that participants in those studies generated more pros relative to the total number of pros and cons if the actions pertained to the distant as compared with the near future. If one assumes that participants generated more arguments when argument generation was easy, then exactly this pattern is predicted by the ease-of-retrieval account: people generate more pros relative to the total number of pros and cons about distant-future as compared with near-future actions because it is easier to generate pros about distant-future as compared with near-future actions, and vice versa for cons.

The amount of generated pros and cons is, however, only a proxy for the experienced ease of retrieval. It is thus necessary to show more directly that temporal distance affects the experienced ease of retrieval of generating pros and cons. We propose that it is not the number of arguments generated per se, but the associated ease of retrieval that drives the changes in attitudes. It is therefore necessary to disentangle the influence of ease of retrieval from the influence of the number of arguments generated. By holding the numbers of arguments generated constant, we tested whether temporal distance influences ease of retrieval and whether ease of retrieval mediates the influence of temporal distance on attitudes. We predicted that the generation of a given number of pros about an action would be experienced as easier when the action pertains to the distant future as compared with the near future, whereas for cons the effects should reverse. Because people hold more favorable attitudes the easier it is to generate pros and the more difficult it is to generate cons (Wänke & Bless, 2000; Wänke et al., 1996), they should be more in favor of the action if it pertains to the distant as compared with the near future. We thus predicted more favorable attitudes towards a distant-future as compared with a near-future action when holding the number of generated arguments constant.

The current study examined thus three hypotheses: (i) we predict an interaction insofar that the generation of pros relative to cons about an action should be facilitated in the distant future, but impeded in the near future. Ideally, pros should be easier to generate if the action pertains to the distant future as compared with the near future, whereas for cons the reverse effect should emerge. Thus, we predict an interaction between the direction of arguments and temporal distance on experienced ease of retrieval. (ii) Participants hold more favorable attitudes towards an action if it pertains to the distant future as compared with the same action that pertains to the near future. (iii) The experienced

ease of retrieval associated with the generation of arguments mediates the influence of temporal distance on attitudes.

## Method

Participants thought about an action that pertained to either the distant or the near future and then generated either four pros or four cons. Subsequently, they reported the experienced ease of retrieval and their attitudes towards the action. The experiment was run on the Internet. The implementation of the online experiment conformed to common standards recommended for online research (Birnbaum, 2004; Reips, 2000, 2002).

### Participants and design

Participants were recruited via email for two different studies and were offered a chance to participate in a lottery where three music CDs were raffled. The email addresses were drawn from a pool of participants who had taken part in earlier online studies conducted by our laboratory and had indicated their interest in being contacted for participation in future online studies. Those participants were originally recruited on university and student websites in Germany. Of the 231 participants who started the online study, 81 were randomly assigned to a 2 (temporal distance: near vs. distant future) by 2 (argument direction: pros vs. cons) between-subject design. Eighty-two participants were assigned to another study and 71 ceased participation before they were assigned to either study. Of the 81 participants assigned to the current study, 24 ceased participation before completing the whole study and six participants did not generate the required four arguments. Eight participants indicated that they were participating in this online study for the second time. Thus, 43 participants were included in the analysis. Participants' ages ranged from 18 to 63 years ( $M=28.8$ ,  $SD=9.6$ ,  $Mdn=25$ ). Thirty of the participants were female, 13 were male. Separate analyses revealed that neither failure to generate the requested amount of arguments nor failure to complete the study for other reasons could be predicted by the experimental manipulations, all effects  $\chi^2s < 1$  and all effects  $\chi^2s < 1.88$ ,  $ps > .17$ , respectively. Thus, exclusion from analysis was not confounded with experimental conditions.

### Materials and procedure

Participants were introduced to the study on the start page. Informed consent was obtained and demographical data were collected. Applying a method of Förster, Friedman, and Liberman (2004), the temporal focus of the participants was manipulated: Participants were instructed to think during 2 min about their life in general and about tasks they would have to manage either next week (*near-future* condition) or in a year from now (*distant-future* condition). Then, participants were introduced to the scenario.

We used the parking ticket scenario of Eyal and colleagues (Eyal et al., 2004, Study 3). Participants were instructed to imagine that the city council of a nearby big city plans to offer public parking lots without charging money for the time span of 1 week, either next week (*near-future* condition) or in a year from now (*distant-future* condition). Then, participants were asked to generate and write down either four pros (*pros* condition) or four cons (*cons* condition). On the next page, participants judged the ease of generating the arguments by indicating on two 9-point scales anchored with 1 ("very easy") and 9 ("very difficult") how difficult it had been to find the arguments and how difficult it would have been to find additional arguments. On the next page, the attitude towards the plan was assessed on six bipolar 11-point scales ranging from  $-5$  to  $+5$ . Participants indicated how they approved the plan ("strongly disapprove" vs. "strongly approve"), how they perceived the plan ("very absurd" vs. "very reasonable"), how they evaluated the plan ("very bad" vs. "very good"), what their reaction would be if the plan was implemented ("very annoyed" vs. "very pleased"), how they judged the consequences of the plan if implemented ("predominantly negative" vs. "predominantly positive") and whether they would use a car to go to this city more or less often if the plan was implemented ("very much less often" vs. "very much more often"). At the end of the online experiment, participants were thanked and debriefed.

## Results

### Compound scores

The two ease-of-retrieval items were highly consistent (Cronbach's  $\alpha=.94$ ), and therefore an ease-of-retrieval score was computed by averaging the two items and then reversing the computed score. Higher values on this ease-of-retrieval score indicate higher ease of retrieval. The six attitude items were highly intercorrelated (Cronbach's  $\alpha=.95$ ) and therefore an attitude score was computed by averaging the six items. Higher values on this attitude score indicate a more positive attitude towards the action.

### Temporal distance and ease of retrieval

As predicted, participants found it easier to generate four pros if the action pertained to the distant future ( $M=5.00$ ,  $SD=1.67$ ) as opposed to the near future ( $M=3.33$ ,  $SD=1.06$ ). In contrast, they found it easier to generate four cons when the action pertained to the near future ( $M=4.67$ ,  $SD=2.04$ ) as opposed to the distant future ( $M=4.07$ ,  $SD=1.49$ ). This predicted interaction between temporal distance and argument direction on the ease-of-retrieval score was significant (see Fig. 1),  $F(1, 39)=4.95$ ,  $p < .05$ ,  $\eta^2=.11$ . Neither the main effect for temporal distance nor the main effect for argument direction was significant,  $F(1, 39)=1.11$ ,  $p=.30$  and  $F < 1$ , respectively.

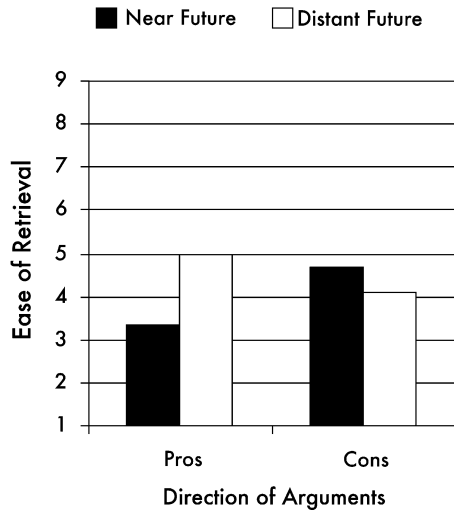


Fig. 1. Ease of retrieval as a function of temporal distance (near vs. distant future) and argument direction (pros vs. cons). Higher values on the ease-of-retrieval score indicate higher ease of retrieval.

Temporal distance and attitudes

We had expected that the attitude judgment would reflect the ease of argument generation. In line with these expectations and the findings regarding the reported ease of retrieval, participants held more positive attitudes towards the action when it pertained to the distant ( $M=1.34$ ,  $SD=2.63$ ) as compared with the near future ( $M=-0.02$ ,  $SD=2.52$ ),  $F(1,39)=5.12$ ,  $p<.05$ ,  $\eta^2=.09$ , (see Fig. 2). Additionally, participants held more positive attitudes towards the action when generating pros ( $M=2.15$ ,  $SD=2.22$ ) as compared with generating cons ( $M=-0.29$ ,  $SD=2.47$ ), as revealed in a significant main effect of argument direction on attitudes,  $F(1,39)=12.62$ ,  $p<.002$ ,  $\eta^2=.23$ . The temporal distance by argument direction interaction was not significant,  $F<1$ .

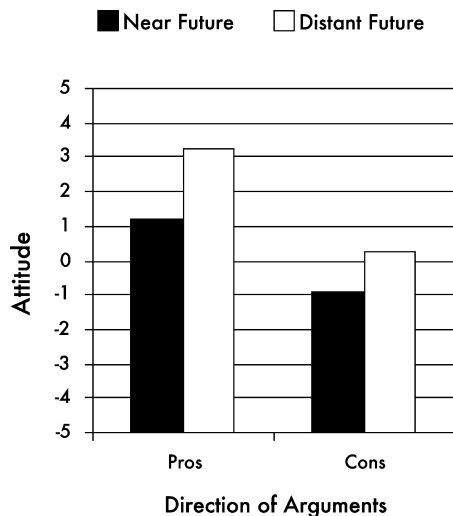


Fig. 2. Attitude as a function of temporal distance (near vs. distant future) and argument direction (pros vs. cons). Higher values on the attitude score indicate a more positive attitude.

Mediation of the temporal distance effect on attitudes through ease of retrieval

The data are in line with the expected pattern: temporal distance affected the subjectively experienced ease of retrieval and attitudes. To test the proposed mediation effect, one should test (i) whether temporal distance predicts attitudes and (ii) whether temporal distance predicts ease of retrieval. It further has to be tested whether (iii) ease of retrieval predicts attitudes and, most importantly, whether (iv) temporal distance predicts attitudes to a lesser degree when ease of retrieval is controlled for (Baron & Kenny, 1986; Kenny, Kashy, & Bolger, 1998). Before the regression analyses were computed, the temporal distance variable was dummy-coded to 0 and 1 for the near-future and the distant-future conditions, respectively. The ease-of-retrieval score and the attitude score were z-transformed separately for the pros and cons conditions to reduce the unexplained variance due to differences between the two conditions. The sign of the z-transformed ease-of-retrieval score in the cons condition was reversed so that higher values on this new ease-of-retrieval score indicate ease of retrieval in favor of the plan (either it was easy to generate pros or difficult to generate cons).

The proposed mediation effect was obtained (see Fig. 3). (i) Temporal distance predicted attitudes,  $\beta=.33$ ,  $p<.05$ , indicating more positive attitudes in the distant-future as compared with the near-future condition. (ii) Temporal distance further predicted ease of retrieval,  $\beta=.32$ ,  $p<.05$ , indicating that it was easier to generate pros and more difficult to generate cons in the distant-future as compared with the near-future condition. (iii) Ease of retrieval predicted attitudes,  $\beta=.38$ ,  $p<.05$ , indicating that participants held more positive attitudes towards the plan the easier it was to generate pros and the more difficult it was to generate cons. (iv) Most importantly, temporal distance no longer reliably predicted attitudes when ease of retrieval was controlled for,  $\beta=.24$ ,  $p=.12$ . As recommended by Shrout and Bolger (2002), a bootstrapping analysis was conducted to test the mediation effect. This bootstrapping analysis showed that the estimation of the mediation effect parameter was

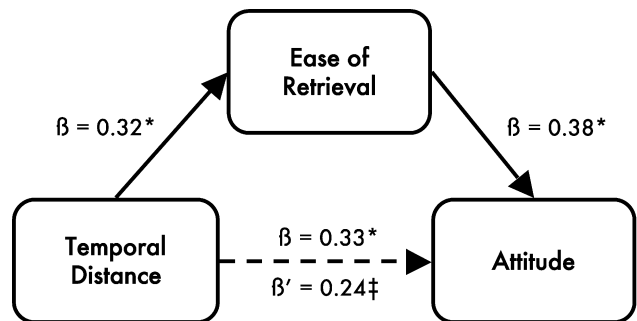


Fig. 3. Proposed mediation model for the influence of temporal distance on attitudes through ease of retrieval (i.e., ease of retrieving pros and difficulty of retrieving cons);  $*p<.05$ ;  $\dagger p=.12$ .



significantly different from zero,  $p < .05$ , two-tailed. Thus, the mediation effect was statistically reliable.<sup>2</sup>

## Discussion

Our results show that, when people consider a future action, the mere temporal distance to the action influences how easily people can come up with pros or cons about the action. As a consequence, the mere temporal distance to the action affects attitudes towards that action even if the number of generated arguments is equal for the near and distant future. People find it easier to generate arguments in favor of an action if that action pertains to the distant as compared with the near future. For cons this effect is reversed: people experience the retrieval of cons about an action as more difficult if that action pertains to the distant as compared with the near future. As a result, people are more in favor of that action if it pertains to the distant rather than the near future. As mediational analyses revealed, ease of retrieval mediates the influence of temporal distance on attitudes. Eyal et al. (2004) found that people generate more pros relative to the total number of pros and cons if the action pertains to the distant as compared with the near future. This finding can be partly explained with reference to the ease of retrieval participants experienced. If one assumes that people generate more arguments the easier it is to find the arguments, and given that pros about distant-future actions are easier to find than pros about near-future actions (and vice versa for cons), then one would expect that the fraction of pros generated is higher for distant-future as compared with near-future actions. This is exactly what Eyal and colleagues found.

The current approach stresses the role of experienced ease of retrieval in mediating the impact of temporal distance on attitudes. However, one alternative account needs to be ruled out. Possibly, temporal distance may affect properties of the arguments themselves, such as the quality or the extremity of the arguments, which may provide an alternative account for the results in this study. One could argue that people generate better and more extreme arguments when temporal distance and argument direction match (pros/distant future and cons/near future)—or when the generation feels easy—as compared with when they do not match (pros/near future and cons/distant future), that is, when the generation feels difficult. Assuming that better

and more extreme arguments lead to attitudes more in line with the arguments generated, the obtained pattern would result. To test whether argument quality and argument extremity are indeed affected by temporal distance and could thus partially mediate the influence of temporal distance on attitudes, two judges—blind to the temporal distance manipulation—rated the generated arguments according to their quality (Cronbach's  $\alpha = .75$ ) and extremity (Cronbach's  $\alpha = .93$ ). Cons were judged to be of higher quality and to be more extreme than pros,  $F(1, 39) = 11.63$ ,  $p < .002$  and  $F(1, 39) = 4.55$ ,  $p < .05$ , respectively. But neither a main effect for temporal distance, nor an interaction between temporal distance and argument direction emerged for either argument quality or argument extremity,  $F_s < 1$ . Thus, temporal distance does not seem to affect argument quality or extremity, and the alternative account that argument quality or extremity mediate the influence of temporal distance on attitudes is not supported.

The remaining direct effect of temporal distance on attitudes after controlling for ease of retrieval, although not significant in the mediation analysis, suggests nevertheless that other factors besides ease of retrieval might additionally mediate the observed effect of temporal distance on attitudes. Perhaps participants in the matching and thus easy conditions spontaneously generated more than the required four arguments because arguments came to mind easily. The higher amount of arguments may have had an additional effect independent of the subjectively experienced ease. However, this explanation is speculative and further research is needed to investigate whether additional mediators are at work.

The current study stresses the importance of ease of retrieval for the CLT framework. As has been demonstrated in several domains, including attitude judgments, ease of retrieval can override the implications of accessible thought content under specified circumstances (Schwarz et al., 1991). For example, it has been shown that participants were more in favor of an issue if they generated three pros as compared with seven pros about the issue because it is easier to generate three pros as compared with seven pros (Wänke et al., 1996). If one had relied only on the accessible thought content (i.e., the number of arguments), one would have predicted that seven pros are more convincing than only three pros. Consequently, to predict attitudes, it is not only important to know *what* comes to mind, but also *how* it comes to mind. For research on CLT it is thus fundamental to consider how temporal distance influences ease of retrieval and how ease of retrieval in turn influences attitudes, judgments, and preferences.

We suggest that ease of retrieval also influences judgments and decisions in other domains not investigated in this study. According to CLT, distant-future events are represented as more simple, abstract and schematic as compared with near-future events (Trope & Liberman, 2003). Possibly it is easier to make predictions about abstractly construed objects as compared with concretely construed objects, and if so, it would be easier to make predictions

<sup>2</sup> The bootstrapping approach to mediation is suggested to be statistically more powerful and appropriate than the more widely known Sobel-test when dealing with small to moderate sample sizes (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002; Shrout & Bolger, 2002). For the bootstrapping analysis, we used a SPSS macro from Preacher and Hayes (2005) with 5000 iterations. Bias corrected confidence intervals of 95% were computed. Separate bootstrapping analyses for the pros and the cons conditions indicated partial mediation in the pros condition ( $p = .06$ , one-tailed), but no mediation in the cons condition. However, these two simple effect analyses should be interpreted with caution because based on CLT we only predicted an interaction (see Footnote 1). Furthermore, each of the two tests involved only half of the sample size.

about distant-future events as compared with near-future events. Given that easy recall or construal results in greater confidence (Tormala, Petty, & Briñol, 2002; Wänke et al., 1996), one would further expect that people should have more confidence in predictions about distant-future events as compared with near-future events. Although not tested directly yet, the finding that people are more confident in predictions about distant-future events as compared with near-future events (Nussbaum, Liberman, & Trope, 2004) is consistent with this reasoning. Aside from this example, we suggest that ease of retrieval mediates judgments and decisions in a variety of different domains.

Because the construal level of objects or actions can influence ease of retrieval, the manipulation of construal level can be used to manipulate the experience of ease of retrieval. More generally, research on ease of retrieval should bear in mind that the construal level of mental representations can influence ease of retrieval.

Trope and Liberman (2003) speculate that CLT also applies to other kinds of psychological distances apart from temporal distance (e.g., spatial distance, social distance). In this view, temporal distance is but one type of psychological distance that influences the construal level of actions and thus affects preferences and judgments. The first studies that tested this claim are consistent with the predictions made by CLT (e.g., Fujita, Henderson, Eng, Trope, & Liberman, 2006; Stephan, 2004), but further evidence has to be accumulated to assess the generalizability of the results found. In line with CLT's proposition that different kinds of psychological distances influence the construal level of mental representations, we suggest that any kind of psychological distance affects ease of retrieval and ease of construal. We further speculate that psychological distance does not exclusively influence ease of retrieval, but also other meta-cognitive experiences (Clore, 1992). Thus, for example, psychological distance might influence feelings of familiarity (e.g., Whittlesea, 1993) and judgments of truth (e.g., Hasher, Goldstein, & Toppino, 1977). To better understand how psychological distance in general, and temporal distance in particular influence human judgment and decision-making, it would be worthwhile to further investigate the mediating role of meta-cognitive experiences.

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