

## Research Article

## Consuming Now or Later?

## The Interactive Effect of Timing and Attribute Alignability

Selin A. Malkoc,<sup>1</sup> Gal Zauberan,<sup>1</sup> and Canan Ulu<sup>2</sup><sup>1</sup>The University of North Carolina at Chapel Hill and <sup>2</sup>Duke University

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**ABSTRACT**—*Decisions are often temporally separated from their outcomes. Using theories of structural alignment and temporal construal, we examined how temporal distance and the associated shift in decision processes moderate susceptibility to context effects. Specifically, in two experiments (one hypothetical, one with real outcomes), we demonstrated that people attend more to nonalignable differences when the outcome of the decision is in the distant future than when it is in the near future. This shift in decision processes was found in preference and choice data, as well as coded written protocols. We further show that this temporal shift cannot be explained by differential involvement with the decision or by the feasibility and desirability of the attributes. Our findings establish temporal distance as an important moderator of structural alignment effects and also extend the implications of temporal construal theory beyond the nature of the attributes to the structural relationships among attributes.*

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Many decisions are temporally separated from their outcomes. For example, an individual might decide which snack to serve at a party held that night or might make a decision for a party next month. In this article, we explore how the decision-making process changes as a result of the joint effect of outcome timing and the relationships among attributes. Specifically, building on structural alignment theory (e.g., Markman & Gentner, 1993; Markman & Medin, 1995) and temporal construal theory (e.g., Trope & Liberman, 2000, 2003), we examine the effect of expected time horizon (near vs. distant future) on how people incorporate different attribute types (alignable vs. nonalignable differences) into their decisions.

Extant research in psychology and behavioral economics has examined context effects in preference formation. Early work focusing on the role of attribute relationships in the evaluation process established that attributes shared by all alternatives receive more attention than attributes that are not shared (Slovic & MacPhillamy, 1974; Tversky, 1977). Extending these ideas, structural alignment theory (Gentner & Markman, 1994, 1997; Markman & Medin, 1995; Medin, Goldstone, & Markman, 1995) further classified attributes into three groups: commonalities (identical attribute levels across alternatives), alignable differences (common attributes that have different levels across alternatives), and nonalignable differences (aspects that do not have a corresponding attribute in other alternatives). Research demonstrated that alignable differences are predominantly used in choosing among alternatives, because commonalities do not discriminate among alternatives and nonalignable differences are difficult to process. The only established moderator of this phenomenon was identified by Zhang and Markman (2001), who demonstrated that the disproportionate focus on alignable attributes is reduced with increased involvement.

Although there has been extensive research demonstrating the importance of attribute relationships in decision making, there has been little research on whether these findings extend to situations in which the outcome is temporally separated from the decision. Temporal distance has been the focus of research in multiple disciplines (e.g., Loewenstein & Elster, 1992; Loewenstein, Read, & Baumeister, 2002) and has been shown to have important effects on a wide range of decisions, including consumer choice (e.g., Soman, 1998; Zauberan, 2003), self-control (e.g., Baumeister & Heatherton, 1996), and delay of gratification (e.g., Metcalfe & Mischel, 1999). In the current work, we explored systematic shifts in attention given to alignable and nonalignable differences as the expected timing of the outcome changed from near to distant future. This perspective was motivated by temporal construal theory (Liberman & Trope, 1998; Trope & Liberman, 2000, 2003), which posits that temporal distance influences responses to future events by systematically changing the level of abstraction at which the events are construed.

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Address correspondence to Selin A. Malkoc or Gal Zauberan, McColl Building, CB # 3490, The University of North Carolina, Chapel Hill, NC 27599-3490; e-mail: selin\_malkoc@unc.edu or zauberan@unc.edu.

Temporal construal theory suggests that individuals tend to represent distant-future events more abstractly than near-future events. When considering the distant future, individuals construe events in terms of simple, general, superordinate, and decontextualized features that convey the essence of the information (high-level construal) and focus on desirability. Conversely, when considering a relatively near-future event, individuals are more likely to focus on feasibility and construe the event in terms of specific, subordinate, incidental, and contextual features that convey details of the information (low-level construal). The theory implies that people are likely to represent situations taking place in the distant future using high-level construal, which would lead to abstract and decontextualized evaluations of the events. Events occurring in the near future, however, will facilitate lower-level construal, which would lead to concrete and contextual evaluations.

Exploring the implications of temporal construal for information processing, Liberman, Sagristano, and Trope (2002) demonstrated that compared with near-future preferences, distant-future preferences are organized around simpler structures. They further showed that objects are categorized into broader categories when they pertain to distant-future situations than when they pertain to near-future situations. Along similar lines, Förster, Friedman, and Liberman (2004) demonstrated that temporal distance also affects processing styles. They found that thinking about the distant future elicits a processing shift toward a more abstract mental representation, facilitating the generation of creative abstract solutions, as well as improving performance on insight tasks. These findings suggest that differences in temporal distance lead to systematic differences in the way information is processed, manifested in more abstract thinking in the distant future than in the near future.

Combining structural alignment theory and temporal construal theory, we propose that changes in the concreteness of representations, caused by varying outcome timing, will change the use of nonalignable attributes. Indeed, abstractness of attributes has been found to increase the comparability of options (Johnson, 1984, 1989). Following the same logic, we argue that abstract mental representation of the options will enhance the processing of noncomparable (nonalignable) attributes. Therefore, compared with decisions that have near-future consequences, decisions that have distant-future consequences will have more abstract and decontextualized representations and will be less affected by attribute relations, leading to an increased consideration of nonalignable attributes. Evaluations of near-future events, in contrast, will be more concrete and context dependent, making detailed comparisons easier and leading to a greater reliance on alignable attributes.

In sum, we introduce temporal distance as a moderator in structural alignment theory and hypothesize that the relative weight of nonalignable attributes in evaluation formation will increase when the outcome is expected in the distant future, compared with the near future. This hypothesis also extends the

implications of temporal construal theory, which thus far has mainly considered the effect of temporal distance on the relative importance of attribute characteristics, especially desirability and feasibility (e.g., Liberman & Trope, 1998; Sagristano, Trope, & Liberman, 2002). In particular, the studies we report here demonstrate that temporal construal theory can help to explain the degree to which individuals are affected by the structure of the attribute space (e.g., alignability).

With two studies, one using hypothetical decisions adapted from studies on structural alignment (Zhang & Markman, 2001) and one with real outcomes, we demonstrate that people rely on nonalignable differences more when the outcome is expected in the distant future than when it is expected in the near future. We also provide evidence that the effects of the expected time horizon on attribute structure are independent of the feasibility or desirability of the attributes and of involvement level.

**STUDY 1**

**Method**

*Participants and Design*

One hundred seventy-seven students participated in the study for partial course credit. The experimental design included a between-participants manipulation of expected time horizon with two conditions (near vs. distant future).

*Materials and Procedure*

As a part of a 1-hr experimental session, participants were presented with a questionnaire outlining the choice situation and asking them to imagine choosing popcorn for a party. They were then provided with descriptions of two popcorn options that were adapted from Zhang and Markman (2001; see Table 1). Each of the two options consisted of 12 attributes (4 commonalities, 4 alignable differences, and 4 nonalignable differ-

**TABLE 1**  
*Stimuli Used in Study 1*

Brand P	Brand Q
Low cost per serving	Low cost per serving
Low level of sodium	Low level of sodium
Not salty	Not salty
Easy to prepare	Easy to prepare
Large-size kernels	Medium-size kernels
Pops in its own bag	Requires a microwave bowl
Calories equal to a slice of bread	Calories equal to a tablespoon of sugar
Crunchiness lasts long	Crunchiness lasts for 3 hours
Slightly low in corn and grain flavor	Easy to swallow
Tastes a bit sweet	Not likely to burn
Has some citric acid	Not tough
With waterproof wrapping	Kind of crispy

Note. Attributes were presented to participants in the order shown here.

ences). Overall, the two options were equally attractive. Brand P (the *alignable better option*) was designed to be more attractive on its alignable attributes, whereas Brand Q (the *nonalignable better option*) was better on its nonalignable attributes.

Following Liberman and Trope (1998), we manipulated time horizon by telling half of the participants that the party was going to take place in the near future (“tomorrow night”) and the other half that it would occur in the distant future (“six months from now”):

Imagine that you have been chosen to be the part of the group that is going to prepare the end of classes party this year, which is going to take place **tomorrow night** [**six months from now**]. You have been given the responsibility of choosing and buying the microwave popcorns for the party. Imagine you are considering two brands, and their attributes are as follows.

The attributes for both options were presented in tabular format. The position of options was counterbalanced and had no significant effect; subsequent analysis ignored this factor. After examining the two options, participants were asked to indicate their preference by allocating 100 points between the options. Next, to obtain more direct process evidence, we asked participants to describe their decision process. The instructions included the following request: “Make sure that you **identify the steps** you took in your decision process and be clear about the **specific attributes you have used** in arriving at your final preference.” Open-ended responses were coded by an independent rater, who was blind to the hypotheses. Coding consisted of counting the number of commonalities, alignable differences, and nonalignable differences mentioned by each participant.

## Results

### Preference

In the analysis of strength of preference, we used only points allocated to the nonalignable better option, because the points summed to 100. We expected to find greater preference for the nonalignable better option in the distant-future condition compared with the near-future condition. As predicted, a single-factor analysis of variance (ANOVA) demonstrated that the mean number of points allocated to the nonalignable better brand was greater in the distant future ( $M = 43.65, SD = 19.09$ ) than in the near future ( $M = 37.76, SD = 18.55$ ),  $F(1, 175) = 4.33, p < .05$ , indicating a greater reliance on nonalignable attributes in the distant compared with the near future (see Fig. 1). Dichotomizing the continuous preference measure to examine the proportion of participants who preferred the nonalignable better option,<sup>1</sup> we found directionally consistent results. As expected, the number of participants who preferred the nonalignable better brand increased from 21% in the near-

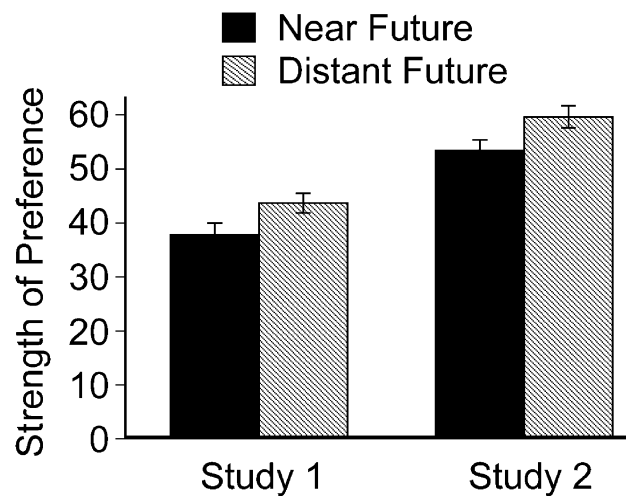


Fig. 1. Mean strength of preference (points allocated) to the nonalignable better brand in Study 1 and in Study 2. Error bars represent standard errors of the mean.

future condition to 30% in the distant-future condition. This difference, however, was not statistically significant,  $\chi^2(1, N = 177) = 1.76, p = .18$ .

### Thought Listings

We expected an increase in the mention of nonalignable attributes relative to alignable attributes in the distant-future condition compared with the near-future condition. A 2 (attribute type: alignable vs. nonalignable)  $\times$  2 (timing: near vs. distant future) mixed-design ANOVA, with attribute type as a repeated factor, supported this prediction. As expected, we found an interaction of attribute type and timing,  $F(1, 175) = 3.98, p < .05$ . Planned contrasts showed that in the near-future condition, the number of alignable differences mentioned ( $M = 1.40, SD = 1.13$ ) was significantly greater than the number of nonalignable differences mentioned ( $M = 0.76, SD = 1.02$ ),  $t(87) = 3.97, p < .001$ , but in the distant-future condition, the difference between mentions of alignable differences ( $M = 1.08, SD = 1.06$ ) and mentions of nonalignable differences ( $M = 0.92, SD = 1.45$ ) was not statistically significant,  $t(88) = 0.88, p = .38$ .

## Discussion

Study 1 supports our hypothesis that people’s susceptibility to context effects systematically differs for situations with different outcome timing. We found that people put more emphasis on nonalignable attributes when the event was expected to take place in the distant compared with the near future. This result is consistent with the idea that people’s representations are more abstract for options in the distant future than for those in the near future (Trope & Liberman, 2000, 2003), leading to increased attention to the nonalignable attributes of the options in the distant future.

<sup>1</sup>Participants who allocated equal points to the two options were evenly and randomly distributed between the two dichotomized groups.

An alternative explanation for these findings might be that the time manipulation not only affected the perceived time horizon, but also led to differential perceived importance for the two situations. That is, perhaps a party that requires 6 months of preparation is inferred to be more important than a party that will take place the upcoming evening, making participants more involved in the distant-future condition than in the near-future condition. Involvement with the decision would also lead to an increased reliance on nonalignable attributes (Zhang & Markman, 2001) and therefore could account for our results. In Study 2, we addressed this point by using real outcomes.

An experiment with real outcomes, and hence representing a more involving decision across conditions, provides a stronger test of our hypothesis. First, if involvement with the decision increases the use of nonalignable attributes, then all participants would generally use more nonalignable attributes, making it more difficult for us to detect our hypothesized effect. Second, and more important, because people discount future outcomes (e.g., Loewenstein & Elster, 1992), the use of real outcomes might mean that participants in the near-future condition would be more involved and thus make greater use of nonalignable attributes than participants in the distant-future condition. Therefore, replicating our findings from Experiment 1 with real choices would counter the alternative explanation of differential involvement and also indicate that the interactive effect of time horizon and attribute alignability is at least partially resistant to the discounting of future outcomes.

## STUDY 2

### Method

#### Participants

One hundred fifty-one students completed the study for partial course credit.

#### Materials and Pretest

Participants were told that they would evaluate and select from two brands of potato chips, which they would actually receive. Participants were presented with descriptions of the two brands that were designed to be equally attractive overall (based on a pretest). One of the options (Brand X) was designed to be better on its alignable attributes, whereas the other option (Brand Y) was better on its nonalignable attributes. To construct the stimuli, we asked two independent pools of participants to rate the importance ( $N = 46$ ) and attractiveness ( $N = 46$ ) of 26 attributes. Both measures were taken on a 9-point scale. On the basis of these ratings, we selected attributes to meet the following criteria:

- Alignable attributes of Brand X (alignable better option) and Brand Y (nonalignable better option) were equally important ( $M_X = 5.10, SD_X = 1.48; M_Y = 4.89, SD_Y = 1.55$ ),  $t(45) = 0.60, p = .55$ , but alignable attributes were more attractive

for Brand X than for Brand Y ( $M_X = 5.35, SD_X = 0.79; M_Y = 3.73, SD_Y = 0.96$ ),  $t(45) = 9.58, p < .01$ .

- Nonalignable attributes of Brand X and Brand Y were equally important ( $M_X = 5.36, SD_X = 1.31; M_Y = 5.14, SD_Y = 1.18$ ),  $t(45) = 1.05, p = .30$ , but nonalignable attributes were more attractive for Brand Y than for Brand X ( $M_X = 2.76, SD_X = 0.96; M_Y = 4.97, SD_Y = 0.93$ ),  $t(45) = 12.59, p < .01$ .

Using these attributes, we formed two sets of descriptions (four commonalities, four alignable differences, and four nonalignable differences) and asked a third independent pool of participants ( $N = 34$ ) to rate the favorability of each option. Brand X ( $M_X = 4.53, SD_X = 1.78$ ) and Brand Y ( $M_Y = 4.68, SD_Y = 1.75$ ) were found to be equally favorable,  $t(34) = 0.34, p = .74$ .

#### Design

Participants completed this study as the first task in a 1-hr session. We manipulated timing of the expected outcome between participants, with two conditions: choice in the near future (“at the end of the session”) and choice in the distant future (“at the end of the semester”). Participants in the near-future condition received their selected brand of potato chips after approximately 1 hr, and participants in the distant-future condition received their preferred brand after 3 weeks. Participants were presented with the following paragraph:

In this study we will provide you with a description of 2 different brands of potato chips and will ask you to evaluate these two brands. Below we provide a description of the two brands for you to evaluate. Note that you will actually receive your choice of potato chip **at the end of this session [at the end of the semester]**. The experimenter will distribute your selected brand of potato chips at the end of the session. [The experimenter will set up a table in front of Café McColl to distribute the potato chip.

**TABLE 2**  
*Stimuli Used in Study 2*

Brand X	Brand Y
Lunch-box package size	Lunch-box package size
National brand	National brand
Original potato taste	Original potato taste
Low cost per serving	Low cost per serving
Crunchy	Somewhat tender
Not too salty	Quite salty
6 grams of fat	9 grams of fat
Calories equal to one plain bagel	Calories equal to a bar of chocolate
Somewhat stale	Distinct potato flavor
Oily appearance	Strong taste
Has a slight aftertaste	Cracker-like
Unevenly coated	Mostly ridged

Note. Attributes were presented to participants in one random order.

You will be contacted via email and informed of the times and days of distribution.]

Descriptions of the two alternatives were presented in a tabular format (see Table 2), and their position was counterbalanced. Position had no significant effect, and data were collapsed across this dimension. After reading the descriptions of the two options, participants were asked to select an option and then to allocate 100 points between the two options. As in Study 1, participants also provided thought listings, and their responses were coded using the same procedure as before.

## Results

### *Preference and Choice*

Supporting our predictions, a single-factor ANOVA testing the effect of timing on preference strength showed a significant effect for timing,  $F(1, 149) = 4.58, p < .05$ , indicating a greater preference for the nonalignable better option in the distant future ( $M = 59.62, SD = 17.45$ ) than in the near future ( $M = 53.43, SD = 17.30$ ; see Fig. 1). Similar results emerged from the choice data. As expected, the nonalignable better brand was chosen more often in the distant-future condition (76%) than in the near-future condition (63%),  $\chi^2(1, N = 151) = 2.73, p < .10$ . The choice results are consistent with the preference data, although the dichotomous choice measure is less sensitive than the continuous preference measure. Note that in contrast to Study 1, Study 2 showed an overall preference for the nonalignable better option in both timing conditions, perhaps because of increased general involvement. However, the most important result is the relative shift toward the nonalignable better option in the distant compared with the near future, which was found in both experiments (Study 1:  $M_s = 37.76$  vs.  $43.65$ , difference =  $5.89$ ; Study 2:  $M_s = 53.43$  vs.  $59.62$ , difference =  $6.19$ ).

### *Thought Listings*

A 2 (attribute type: alignable vs. nonalignable)  $\times$  2 (time: near vs. distant future) mixed-design ANOVA again found a significant interaction between attribute type and timing,  $F(1, 148) = 4.65, p < .05$ . In line with our predictions, the results showed no significant differences between attribute types in the near-future condition,  $t(58) = 1.16, p = .25$ ; participants mentioned alignable differences ( $M = 1.39, SD = 1.22$ ) and nonalignable differences ( $M = 1.64, SD = 1.17$ ) equally. However, when the expected outcome was in the distant future, we found significantly more mentions of nonalignable differences ( $M = 2.00, SD = 1.56$ ) than alignable differences ( $M = 1.62, SD = 1.21$ ),  $t(90) = 2.00, p < .05$ . Consistent with the preference and choice results, the results for the thought listings show a relative shift toward the nonalignable attributes from the near-future to the distant-future condition.

## Discussion

The second study provides further support for the hypothesis that people respond to the structural alignment of attributes differently in the near versus the distant future. Using choices with real consequences, we again demonstrated that individuals were less likely to be affected by the attribute structure in the distant future than in the near future. We found that nonalignable attributes had a greater influence on their evaluations in the distant future than in the near future. The results also showed that this temporal shift was not due to increased involvement with the situation. Decisions with real consequences led to an overall increase in the weight given to nonalignable attributes in both conditions, possibly because of increased involvement levels (Zhang & Markman, 2001). However, expected time horizon had an effect on the weight of nonalignable attributes above and beyond the effect of involvement. These results provide further support for our prediction that the effects of structural alignment are moderated by temporal distance between the decision and its outcome.

A possible alternative explanation for our findings is that our results are not due to changes in the differential consideration of alignable and nonalignable attributes, but rather are due to differential feasibility and desirability of the attributes (e.g., Liberman & Trope, 1998). That is, if the alignable attributes we used were relatively more feasible than the nonalignable attributes and the nonalignable attributes were relatively more desirable than the alignable attributes, this might have caused the temporal shift we observed. To conclusively rule out this possibility, we conducted a posttest. Two weeks after Study 2, we asked a subset of the same group of participants ( $N = 114$ ) to rate both the feasibility and the desirability of each attribute. We found that alignable attributes ( $M = 7.64, SD = 2.13$ ) and nonalignable attributes ( $M = 7.77, SD = 1.85$ ) were equally feasible,  $t(113) = 1.06, p = .29$ , and that alignable attributes ( $M = 7.19, SD = 1.83$ ) were more desirable than nonalignable attributes ( $M = 6.32, SD = 1.25$ ),  $t(113) = 5.3, p < .05$ . These posttest results indicate that the desirability and feasibility of the attributes cannot explain our basic findings, because it was the alignable attributes that were rated as desirable. Temporal construal theory would predict an increased emphasis on the desirable attributes in the distant future, leading to greater use of alignable attributes in that condition. Our results showed the opposite pattern—increased relative reliance on the nonalignable attributes in the distant-future condition.

## GENERAL DISCUSSION

This article reports systematic differences in the way people react to the decision context as a function of the temporal distance separating the decision and its outcome. Building on structural alignment and temporal construal theories, we propose that individuals rely less on alignable attributes when making decisions with consequences in the distant future than

when making decisions with consequences in the near future; thus, they show an increased reliance on nonalignable attributes in the distant future. Results of two experiments, using both hypothetical and real outcomes, provide support for this hypothesis. We have also established that these results were not due to differential involvement with the situation and cannot be explained by the desirability and feasibility of the attributes. Note that our investigation did not include a direct test of a shift in mental representation per se. Instead, we took an approach similar to that of Sagristano et al. (2002), who studied the effect of temporal construal on preferences for gambles in the near versus distant future. We, too, have focused on the implications of temporal construal theory for decision processes and have presented direct evidence of a shift in usage of attribute types as a function of expected outcome timing.

Our findings contribute to the existing literature on alignability by identifying decision timing as an important moderator of structural alignability effects and showing that when the outcome is in the distant future, the relative use of nonalignable attributes increases. We have also expanded the implications of temporal construal theory from the nature of the attributes to the structure of the attribute space. We have shown that the decision processes associated with different time horizons affect the way structural relationships among attributes (i.e., alignability) are incorporated when forming evaluations. Specifically, concrete representations in the near future lead people to rely more on alignable than nonalignable differences; but the abstractness associated with the distant future attenuates this context effect and leads to greater use of nonalignable differences.

Most important, however, the findings we report provide one notable example in which expected timing of the outcome moderates established context effects. We focused on the effect of attribute alignability on individuals' decision processes, but numerous context effects have been studied previously. We conjecture that systematic time-dependent shifts in mental representation will moderate other context and framing effects that also depend on the structure of attribute space. For instance, because temporal distance changes the level of abstractness, the effect of separate versus joint evaluations (Hsee, Loewenstein, Blount, & Bazerman, 1999), the asymmetric dominance effect (Huber, Payne, & Puto, 1982), and the compromise effect (Simonson, 1989) might all be attenuated when the alternatives are considered for future rather than current use.

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