The effect of temporal distance on level of mental construal

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Abstract

Four studies examined the prediction of construal level theory that the more distant future events would be construed in higher-level, more abstract, and simple terms. Objects were categorized into broader categories when they pertained to distant future situations than to near future situations (Study 1). Positive and negative experiences in the more distant future were expected to be more prototypical—less variable and more extreme (Study 2). More distant future coping experiences were expected to be less variable (Study 3). Preferences for events and activities that were expected in the distant future were organized around simpler structures than preferences for the same events when they were expected in the near future (Study 4). These results support the principle of temporal construal, according to which the more distant future is represented in a more schematic, abstract, and coherent way.
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A large amount of empirical research as well as anecdotal evidence suggest that temporal distance from future events systematically changes people's responses to those events. Thus, research in behavioral economics has found that future outcomes typically undergo discounting at a rate that is steeper than would be justified by purely economic considerations (for reviews, see Frederick, Loewenstein, & O'Donoghue, 2001; Loewenstein & Prelec, 1992). Research on decision making has shown that people often take more risk and feel more confident about the more distant future (Gilovich, Kerr, & Medvec, 1993; Nisan, 1972). Research on delay of gratification and self-control has shown that both humans and animals are better able to delay gratification with respect to distant future outcomes than near future outcomes (Ainslie, 1975; Mischel, 1974; Rachlin, 1995; Trope & Fishbach, 2000). This research has identified important regularities in temporal changes in responses to future events but paid relatively little attention to the cognitive mechanisms that could mediate these effects (but see Mischel, Shoda, & Rodriguez, 1989). The present paper is designed to close this empirical gap: we explore the cognitive mechanism that

may underlie the effects of future time perspective on judgment, evaluation, and decision.

Our approach to the question of intertemporal evaluation and choice is based on the social cognitive view that people's responses to social events are based on how they mentally construe those events (Griffin & Ross, 1991; Pennington & Hastie, 1988, 1993; Ross, 1990; Semin & Fiedler, 1988; Semin & Smith, 1999; Smith, 1998; Trafimow & Wyer, 1993; Vallacher & Wegner, 1986, 1987; Wilson & Brekke, 1994). This view would suggest that temporal distance changes people's responses to future events by changing the way they construe these events. Construal level theory (CLT) specifically proposes that mental construal involves abstraction and that temporal distance is one of the factors that determine the level of abstraction (Liberman & Trope, 1998; Trope & Liberman, 2000). Previous research has already demonstrated that distant future actions are construed more abstractly than near future actions (Liberman & Trope, Study 1). The purpose of the present paper is to extend these findings to objects of construal beyond actions and to levels of construal beyond action hierarchies.

According to CLT, people construct more abstract representations (high-level construals) of information pertaining to distant future events and more concrete representations (low-level construals) of information

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pertaining to near future events. For example, in construing the more distant future, people would be more likely to use stereotypes rather than individuating information, generalized scripts rather than more concrete, non-schematic details, trait concept rather than situation-specific goals, and causal explanations rather than unconnected occurrences. As a result, the evaluative implications of the more abstract construals would be more prominent in the more distant future. For example, a distant future behavior is likely to be represented as "expressing friendliness" and thus seem quite positive, but when imagined in the near future the same behavior would be construed as "dialing a friend's number" and thus seem fairly neutral (Nussbaum, Trope, & Liberman, 2001a).

How does abstraction change the meaning of an event? A defining property of concrete representations is that they lend themselves to multiple abstract representations. For example, the concrete action "waving the hand" could be identified more abstractly as threatening or, alternatively, as being friendly (Vallacher & Wegner, 1987), and "a poodle" could be classified as a pet or, alternatively, as a mammal (Rosch & Lloyd, 1978). Usually, some aspects of the focal stimulus are more closely related to one interpretation or categorization (e.g., the hand movement was relatively fast; poodles are friendly), while other aspects are more closely related to the other interpretation or categorization (the person who waved her hand seemed to smile; poodles are warm blooded). Moving from a concrete representation to an abstract representation involves deciding on one of the alternative abstract representations. This, in turn, means omitting the features that are perceived to be less important while retaining those considered more central or important to the construct in question. For example, in replacing "waving the hand" with the more abstract construal "showing friendliness," the fact that one used one's hand is omitted (Semin & Fiedler, 1988). Similarly, in representing a poodle as a pet, warm-bloodedness is omitted (Rosch & Lloyd, 1978). Like irrelevant details, details that are inconsistent with the chosen abstract representation are omitted from the representation or assimilated into it. For example, the detail that the hand waving was slightly faster than usual would be omitted or modified once the "being friendly" interpretation is chosen.

Because abstract representations necessarily impose one of a few possible alternative interpretations, and because irrelevant or inconsistent details are omitted from the abstract representation or assimilated to it, abstract representations may be expected to be simpler, less ambiguous, and more prototypical than concrete representations (Fiske & Taylor, 1991, p. 98; Smith, 1998). Temporal construal theory thus proposes that the distant future is construed in a more abstract way, and thus construals of the distant future are more

schematic—less ambiguous and more simple and coherent than construals of the near future.

There are multiple levels of abstractness, as one could construct less inclusive or more inclusive categories of objects (e.g., poodle, dog, and mammal). In feature-based theories of categorization, more inclusive categories have fewer features and therefore are simpler than concrete categories (Rosch & Lloyd, 1978). Actions also form hierarchies of abstractness (e.g., giving money, helping, and being a good person) with each level of abstractness containing less concrete details about the specific type of action performed and the objects it involved (Semin & Fiedler, 1988; Trope, 1989). In the same way, traits form hierarchies (e.g., an excellent guitarist, musical, and talented) such that more abstract traits are less detailed about the behaviors, objects, circumstances, and people it involves (Hampson, John, & Goldberg, 1986). Goal-directed actions form hierarchies too, as goals could be translated into more abstract superodinate goals (Carver & Scheier, 1990, 1999; Miller, Galanter, & Pribram, 1960; Vallacher & Wegner, 1987). In such hierarchies, each action (e.g., studying for an exam) has a superodinate, abstract level, which answers the question of why the action is performed (e.g., doing well) and a subordinate, concrete level, which supplies the details of how the action is to be performed (e.g., reading a textbook).

In sum, we suggest, in line with other theories of mental construal, that abstract mental models represent the rich, detailed and possibly ambiguous information contained in a real social event in a relatively simple and coherent mental model. Moreover, it is possible to think about levels of abstractness as a gradual reduction in details and complexity of representations. We further suggest that higher level, more abstract, simple, and coherent representations are formed of events in the more distant future.

Our research so far has examined the implications of CLT for evaluation, prediction, and choice (Liberman & Trope, 1998; Nussbaum, Trope, & Liberman, 2001b; Sagristano, Trope, & Liberman, 2001; Trope & Liberman, 2000). These studies demonstrate that the informational and evaluative implications of superordinate, general aspects of future events are more influential in determining responses to distant future then near future events. For example, one series of studies investigated temporal changes in the influence of information about superordinate goals ("why" aspects of action) and information about subordinate means for reaching those goals ("how" aspects of action) on evaluation and choice (Liberman & Trope, 1998). These studies found that information about "why" aspects of actions was more influential in decisions for the distant future, whereas information about "how" aspects of actions was more influential in decisions for the near future. Another series of studies by Nussbaum et al. (2001b)

examined how participants' predictions of their own performance level was influenced by their perceived general competence and by information about specific task characteristics. These studies found that participants' predictions of performance on a distant future quiz were more influenced by their perceived competence (an abstract, high-level consideration) than by information about whether the quiz was multiple-choice or open-ended (a concrete, low-level consideration), whereas the reverse held for predictions of performance on a near future quiz.

These and other studies on evaluation, prediction, and choice provide only indirect evidence for differential construal of near and distant future situations. Only one study directly examined differences in construal as a function of temporal distance (Liberman & Trope, 1998, Study 1). This study examined how the tendency to construe an action in superordinate, high-level terms vs. subordinate, low-level terms changes with temporal perspective. The first, open-ended part of the study asked participants to imagine engaging in seven activities (e.g., "reading a science fiction book," "taking an exam") either "tomorrow" or "next year" and to describe these activities. The analysis of the content of these descriptions was based on the assumption that superordinate, high-level descriptions of an activity fit the structure "[description] by [activity]," whereas subordinate, low-level descriptions fit the structure "[activity] by [description]" (Hampson et al., 1986; Vallacher & Wegner, 1986, 2000). For example, a description of the activity "reading a science fiction book" as "broadening my horizons" fits the first structure ("I broaden my horizons by reading a science fiction book"), but not the second structure ("I read a science fiction book by broadening my horizons"). Therefore, this description was classified as a high construal of the activity. In contrast, the description "flipping pages" fits the second structure ("I read a science fiction book by flipping pages") but not the first structure ("I flip pages by reading a science fiction book"), and thus constitutes a low-level construal of the activity. As predicted, this analysis revealed that high-level descriptions were more common in the distant future condition compared to the near future condition, and the reverse was true for low-level descriptions.

The second, forced choice part of the study used an adapted version of Vallacher and Wegner's (1989) "Level of Personal Agency" questionnaire that was originally designed to assess stable individual differences in action identification. The questionnaire presents 19 activities, each followed by two restatements, one corresponding to the "why" (high-level) aspects of the activity and the other corresponding to the "how" (low-level) aspects of the activity. For example, "locking a door" is followed by a choice between the alternative restatements "putting a key in the lock" and "securing the house." To manipulate temporal perspective, we added a time indicator to each activity, either "tomorrow" or "sometime next year." As predicted by CLT, participants chose a significantly more high-level, "why" restatements in the distant future condition than in the near future condition.

As stated before, the present research extends these findings to dimensions of level of construal beyond action hierarchies and to objects of construal beyond actions. Specifically, we examine whether temporal distance increases the breadth of object-categories (Study 1), the prototypicality of anticipated experiences (Studies 2 and 3), and the simplicity of preferences (Study 4). We predict that in construing the more distant future, broader object categories would be used, more prototypical experiences would be anticipated and simpler structures would underlie preferences.

Study 1. Breadth of categories of objects for future use

One way to conceptualize the abstractness of categories is simply by their level of inclusiveness or breadth. Abstract categories (e.g., food) are more inclusive than concrete, subordinate categories (e.g., snacks). The present study tested the prediction, derived from CLT, that individuals will use fewer, broader categories to classify objects that pertain to distant future situations than to near future situations. Participants imagined themselves in various situations (e.g., going to a camping trip) in either the near future or the distant future and classified the objects related to each situation (e.g., potato chips, hot dogs) into as many categories as they thought appropriate. We examined how temporal distance affected the breadth of categories into which the objects were classified.

Method

Participants

Eighty-four undergraduate New York University students (25 males, 59 females) participated in the study for course credit. In this and the following studies there were no differences between male and female participants in any of the results.

Procedure

The study was carried out in October 1999. Upon arriving to the lab, participants were introduced to a study on planning leisure activities and received a questionnaire that had four pages with one scenario and 38 related objects on each page. The near (distant) future version of the scenarios is presented below.

Camping: "Imagine that you are going with friends on your annual Oktoberfest camping trip for this

upcoming weekend (on the weekend of October 7–9, 2000)." The objects were: brush, tent, matches, camera, soap, gloves, bathing suit, shovel, fishing pole, hat, snorkel, shirts, sweater, sneakers, coat, raft, dog, boots, marshmallows, socks, blanket, flashlight, pants, sunglasses, rifle, shoes, cigarettes, rope, hot dogs, canteen, toothbrush, underwear, beer, sleeping bag, pillow insect repellant, potato chips, and ax.

Moving out: "Imagine that you are going to be moving into a new apartment this coming Friday (sometime in August, next year—2000)." The objects were: desk, VCR, pets, blinds, computer, pictures, coats, answering machine, paintings, blender, refrigerator magnets, stereo, shirts, silverware, bed, musical instrument, spatula, tapestries, jewelry, plants, tables, letters, underwear, CDs, wok, telephone, posters, microwave oven, dresser, rugs, dinner plates, printer, videocassettes, pants, TV, tools, shelves, and alarm clock.

Yard sale: "Imagine that you will be having a yard sale this upcoming weekend (sometime next summer, in 2000)." The objects were: chairs, roller blades, sweaters, crib, candy dish, fish tank, board games, blender, bikes, coats, dumbbells, infant clothes, books, coffee maker, puzzles, plates, CDs, toaster, toys, cutlery, shoes, skis, chess set, bird cage, ties, baseball cards, picture frames, juicer, ceramic figurines, glassware, boots, dolls, clock, records, T-shirts, lamps, skateboards, and paint brushes.

NYC visit: "Imagine that a friend of yours is visiting this upcoming weekend (one weekend next June, 2000). This friend has never been to New York, and she asks you to show her some interesting places." The objects were: 59th Street Bridge, Metropolitan Opera, West Village, Madison Square Garden, *Stomp*, World Trade Center, Verrazano Bridge, Grant's Tomb, Rockefeller Center, Metropolitan Museum of Art, Apollo Theatre, Wall Street, Shea Stadium, Museum of Modern Art, South Street Seaport, *Les Miserables*, Staten Island Zoo, Washington Square Park, Battery Park City, Fifth Avenue, Rockaway Beach, Times Square, Chinatown, *Hedwig and the Angry Inch*, Macy's, Coney Island, Museum of Natural History, Yankee Stadium, Chrysler Building, The Cloisters Museum, East Village, Statue of Liberty, Guggenheim Museum, Empire State Building, Central Park, Radio City Music Hall, Brooklyn Bridge, and Flatiron Building.

In each scenario, the instructions were: "Take a look at the following items and place them into groups by writing the items that belong together next to each other on the right, and then circling the items that belong in the same group. Please make sure to include every item, even if you would not use it in reality. Additionally, please do not overlap, that is, place each item in only one group." Participants responded on the same page, then moved to the next scenario. All the scenarios in a questionnaire were in the same time-perspective condition. The order of the scenarios was counterbalanced

between participants and had no effect on the results. At the end of the study participants were debriefed, thanked for taking part and received the course credit.

Results

We counted the number of groups into which participants classified the objects of each scenario. Forming fewer groups means applying broader, more abstract categorization, and thus was predicted to be the case in classifying objects in distant future situations more than in near future situations. As can be seen in Fig. 1 and consistent with this prediction, people used fewer categories to classify the objects they imagined in a distant future scenario than in a near future scenario, $t(82) = 2.55$, $p < .01$, for camping trip; $t(82) = 1.20$, $p = .25$, for moving out; $t(82) = 3.17$, $p < .005$, for yard sale; $t(82) = 3.80$, $p < .001$, for NYC visit. Overall, the mean number of categories was 7.06 for the near future scenarios and 5.90 for the distant future scenarios, $t(82) = 3.82$, $p < .001$.

Thus, the same set of objects was classified into broader categories when they were part of a distant future situation than a near future situation. This finding is consistent with the CLT assumption that distant future events are represented in terms of relatively high-level, abstract categories, whereas near future events are represented in terms of lower-level, more specific categories.

Study 2. The prototypicality of future experiences

High-level construal of the future should lead individuals to expect future events to be more schematic, and thus resemble the prototype of the event's category. For example, a schematically construed good day would consist of prototypically positive experiences, and a schematically construed bad day would consist of prototypically negative experiences. According to CLT, such prototypic construals are more likely to be applied
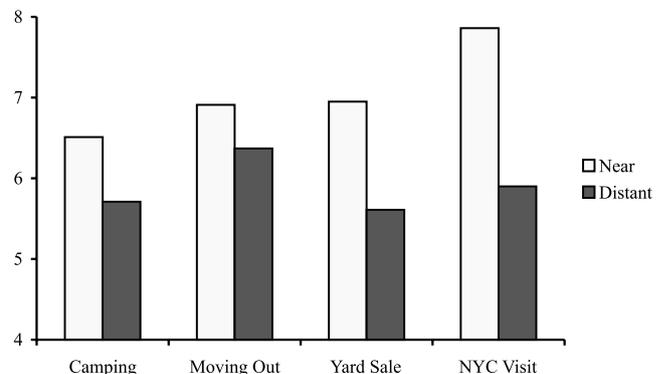
Fig. 1. Mean number of categories used to classify objects in near and distant future scenarios.

to distant future experiences. A greater range of exemplars or experiences, including less typical ones, is more likely to come to mind in thinking about a near future class of experiences. Thus, in the near future, a good day may include some neutral and even somewhat unpleasant experiences, and a bad day may include neutral and even somewhat pleasant experiences. We therefore predicted that distant future good and bad days, compared to near future good and bad days, would show less intra-category heterogeneity (i.e., less diversity of experiences within each type of day) and more inter-category heterogeneity (i.e., the good and the bad days would be more distinct from each other).

Method

Participants

One-hundred and sixty undergraduate Columbia University students (69 males, 81 females) participated in a one hour study for a payment of $8.

Procedure and materials

Participants completed 20 min of unrelated tasks before they were introduced to the present study. They were randomly assigned to receive one of the four questionnaires. The title of the near (distant) future good day version of the questionnaire was "Experiences of good days" and the instructions were: "We all have good days and bad days in our lives. In the present study we would like to ask about your own experience of good days. Please imagine yourself tomorrow (a year from now). Imagine now that tomorrow (a year from now) you are having a good day. Spend a minute or two thinking about all the things that are going to happen to you during that good day tomorrow (a year from now). Now, please list these things below, each on a separate line." The bad day version was obtained by replacing "good" with "bad" and vice versa. On the second page of the questionnaire, participants were instructed to re-read the events they listed and rate how positive or negative was each of these events on a scale ranging from −3 (very negative) to 3 (very positive), with 0 labeled "neutral." Participants then rated how realistic was the day they described on a scale ranging from 1 (not at all) to 7 (very realistic). At the end of the experiment participants were paid, debriefed and thanked for taking part.

Results

Fourteen participants (9%) did not rate the listed events and were excluded from the study. Five participants (3%) listed only one event and were excluded from

the study as well. For each of the remaining 141 participants, we computed the number, mean, and the standard deviation of the positivity ratings of the listed events and entered these measures into a 2(time: near vs. distant) × 2(type of day: good day vs. bad day) between-subjects ANOVA.

Participants generated, on average, 9.11 events. This number did not vary as a function of time, type of day or their interaction, all $Fs < 1$. The ANOVA of the mean event ratings revealed a trivial effect for type of day, as positive days had more positive events ($M = 2.37$) than negative days ($M = -1.90$), $F(1, 137) = 2441$, $p < .0001$. The main effect for time was insignificant, $F < 1$. More importantly, and as predicted, a significant time × type of day interaction was found, $F(1, 137) = 5.66$, $p < .02$, showing that a good day a year from now seemed better than a good day tomorrow ($M = 2.49$ and $M = 2.25$, respectively) whereas a bad day a year from now seemed worse than a bad day tomorrow ($M = -1.98$ and $M = -1.81$, respectively).

Analysis of the standard deviations of the event ratings revealed the predicted main effect for time, $F(1, 137) = 5.59$, $p < .02$, indicating that the events expected for the near future day (good or bad) were more diverse in valence ($M = .84$) than the experiences expected for the distant future day ($M = .70$). There was also a main effect for type of day, showing that good days were less diverse than bad days ($M = .51$ vs. $M = 1.05$, respectively), $F(1, 137) = 11.63$, $p < .001$. Possibly, positive events, like positive moods, are associated with more integration and less differentiation than negative events or negative moods (e.g., Sinclair & Mark, 1995). There was no interaction, $F < 1$. Together, the means and the standard deviations of the ratings of events show that more extreme, prototypical experiences were expected in the distant future than in the near future.

Our participants also indicated how realistic was the day they described. These ratings revealed a strong optimism effect (that may or may not be justified)—positive days were rated as more realistic ($M = 4.75$) than negative days ($M = 3.54$), $F(1, 137) = 8.26$, $p < .01$. There was no main effect for temporal distance or interaction, both $Fs < 1$. Thus, our measures showed that participants evaluated the near and the distant future days as equally realistic.

These results suggest, consistent with CLT, that the representation of experiences anticipated in the distant future are more schematic than the representation of the same experiences when they are anticipated in the near future. This was reflected in greater intra-category homogeneity (i.e., less diverse experiences within each type of day) as well as greater inter-category divergence (the good and the bad days were more extreme and distinct from each other) for the more distant days.

Interestingly, the present study qualifies the idea that people simply construe the distant future as more positive

than the near future (see, e.g., Gilovich et al., 1993; Mitchell, Thompson, Peterson, & Cronc, 1997). That is, our participants expected a distant future good day to be better than a near future day but, contrary to a simple optimistic bias, they also expected a bad day to be worse in the distant future than in the near future.

The present findings are also related to Wilson, Wheatley, Meyers, Gilbert, and Axsom (2000) research on the tendency to overestimate the intensity of one's emotional future experiences. For example, one of their studies showed that football fans predicted that they would be happier if their team wins and sadder if it loses than they actually were. These authors argued that such mispredictions reflect focalism, a tendency to focus on the event in question and ignore the diluting effect of unrelated contextual events. Focalism is related to the present conceptualization of schematic, high-level construal of an event, inasmuch as contextual events are not part of the event's schema. However, whereas focalism refers to discrepancies between predictions and reality, our findings demonstrate discrepancies between predictions of events in the distant future and the near future.

In the present study people were free to generate events and therefore different types of events could have been generated in the two-time perspective conditions. For example, participants in the distant future condition could have thought about the best or the worst day they will have within a year, which would be, probably, more extreme than a good or a bad day tomorrow. It could be, therefore, that our results reflect differences in content and not only differences in construal. Our next study address this possible limitation by examining time-dependent differences in construal that cannot be attributed to differential content in the near and the distant future conditions.

Study 3. Variability of future coping experiences

The present study provided participants with a list of everyday life tasks (e.g., getting along with others in your personal life, handling responsibilities, and daily demands) and asked them to rate how well they expect to cope with them in either the near future or the distant future. As in the previous study, we expected to find a more inter-category variance (i.e., more differentiation between tasks) in the near future than in the distant future.

Method

Participants

Sixty-four undergraduate Indiana University students (25 males, 39 females) participated in a 30-min study for a payment of $5.

Procedure

Participants first completed tasks unrelated to the present study for 5 min and then received a questionnaire entitled "life style questionnaire." Participants were randomly assigned to either the near future or the distant future condition. The instructions in the near (distant) future condition were as follows: "Please imagine your life during the next week" (a week a year from now, i.e., the period of time starting a year from now and ending a week later). Try to think of all the things you are going to do, experience, and cope with during that period. Please indicate how well you expect to do with respect to each of the following things during the next week (the week a year from now). Participants indicated their responses on scales ranging from 1 (not at all well) to 7 (extremely well).

Participants rated the following 31 everyday life tasks, always in the same order: cleaning and maintaining your room/apartment/house, getting along with others in your personal life, handling responsibilities and daily demands, making the right decisions, avoiding arguing with others, keeping calm, accepting responsibility for your own actions and behaviors, handling all the things required of you in your personal life, acting in a relaxed manner, handling disagreements by compromising and meeting other people half-way, attending classes, saying level-headed, giving people the time and attention they need, being pleasant, reading books unrelated to your studies, attending cultural events, exercising regularly, keeping up with school reading, keeping a healthy diet, forming new relationships, being attentive and supportive towards people, participating in class discussions, remembering birthdays and other significant events in the life of other people, making time for resting and relaxing, maintaining good relations with your parents, managing your finances, managing your time, preparing papers and class presentations, getting enough sleep, coping with minor illnesses (flu, headaches), and being energetic. After completing the questionnaire, participants were thanked for taking part in the study, debriefed, and paid.

Results

For each participant, we computed the standard deviation of his/her 31 ratings of how well he/she expected to cope with the tasks. These standard deviations were subjected to a one-way ANOVA, with time as a between-subjects factor. As predicted, the standard deviations were higher in the near future condition ($M = 1.44$) than in the distant future condition ($M = 1.20$), $F(1, 63) = 5.63$, $p < .02$. We also computed, for each participant, the mean rating of how well he or she expected to cope with the different domains. Interestingly,

a one-way ANOVA showed that people did not expect to cope significantly better in the distant future ($M = 5.14$) than in the near future ($M = 4.90$), $F(1, 63) = 1.60$, $p = .21$, and the difference between the standard deviations of near and distant future coping scores remained significant when the mean coping ratings were controlled for. Thus, the reduced variability in distant future experiences cannot be attributed to the expectation that these experiences would be overall more positive.

The present study provided participants with a fixed set of life tasks. Nevertheless, participants' judgments of their own anticipated coping with those tasks were more variable in the near future than in the distant future. Like the results of Study 2, these results are consistent with the assumption of CLT that people represent the more distant future in a simpler, less differentiated manner.

Study 4. Complexity of the structure of future preferences

If, as CLT proposes, the distant future is construed more schematically than the near future, then a simpler structure should underlie people's preferences regarding the distant future than the near future. To test this prediction, we asked participants to rate the attractiveness of different experiences (e.g., daily activities) in the near and the distant future. We examined the dimensional structure of these ratings and predicted that fewer dimensions would be needed to fit the structure of distant future ratings than the structure of near future ratings.

Method

Participants

Two-hundred and fourteen undergraduate New York University students (71 males, 143 females) participated in the study for course credit.

Procedure and materials

Upon arriving to the lab, participants were introduced to a study on personal preferences and evaluation styles and received a questionnaire, which instructed them to indicate to what extent they would like to experience various events. In the near future condition, the hypothetical events were to happen on the next day (e.g., "How much would you like to meet Madeline Albright tomorrow?"), whereas in the distant future condition the event was to happen in a specified point in time 2–6 months away (e.g., "How much would you like to meet Madeline Albright four months from now?"). On each page, 25 events from one of the three domains

were listed, each followed by a scale ranging from 1 (not at all) to 7 (very much). The three domains of events were life events (e.g., getting a parking ticket, finding change in a payphone), daily activities (e.g., doing homework, watching the news), and meeting people (e.g., Madeline Albright, Ted Turner, Fabio). The questions asked regarding these domains were as follows (distant future condition in parenthesis): for life events, "Indicate what you would think of the following events happening to you tomorrow (one day next spring);" for daily activities, "Indicate how much you would like to do the following activities tomorrow (over winter break)," and for meeting people, "Indicate how interested you would be in meeting the following people today (next year)." The order of the three types of events was counterbalanced across participants and had no effect on the results. At the end of the study participants were debriefed, thanked for taking part, and given the course credit.

Results

We predicted that modeling participants' ratings would reveal a simpler structure for the distant future ratings than the near future ratings. This should be evident in fewer dimensions being necessary to model distant ratings than near ratings to achieve a given level of fit. To test this prediction, we subjected the ratings of the items in each of the three domains to a non-metric multi-dimensional scaling analysis (Kruskal & Wish, 1978; Shepard, 1962). Multi-dimensional scaling (MDS) represents a set of data as points in an *n*-dimensional space, with each point corresponding to an object in the data set. The more similar are two data points, the more proximal they will be. The input for the MDS procedure is the covariances matrix of the items. In our study, the 25 items produced a 300 entry matrix $1/2(25 \times (25 - 1)) = 300$ in each of the three domains (i.e., events, people, and activities). Each of these matrixes was subjected to multi-dimensional scaling analyses using two, three, and four dimensions. All distances in the analyses were Euclidean and primary treatment of ties was used in every case.

Of particular interest for our purposes is a measure of how well the model fits the data. We thus computed a goodness-of-fit measure (R^2), which represents the proportion of variance of the data set that is accounted for by the simplified geometrical model. A higher RSQ is indicative of better fit and, naturally, is achieved when more dimensions are added to the model. A model with as many dimensions as there are parameters in the matrix would have a perfect RSQ of 1. Since we believe distant future representations are simpler and more schematic than those of the near future, it follows that we expect a given number of dimensions to have a higher RSQ in the distant future than in the near future.
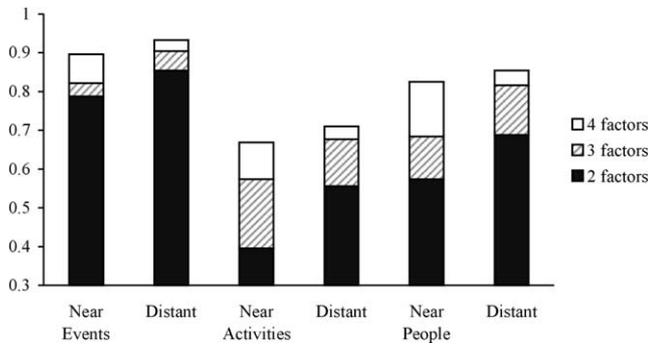
Fig. 2. Goodness of fit (RSQ) of 2-, 3-, and 4-dimensional representations of near and distant future preferences for events, activities, and people.

As predicted, in all three domains, the distant future preferences produced a better fit in two-, three-, and four-factor solutions than the near future preferences, as evidenced by lower RSQ in the near condition for a given number of dimensions (see Fig. 2). Specifically, for the "daily activities" domain, the RSQ values in the near condition were .40, .57, and .67 for the 2-, 3-, and 4-dimensional solutions, respectively. Corresponding RSQ values in the distant condition were .56, .68, and .71. Results were similar in the "life events" domain, with RSQ values of .79, .82, and .90 for the near condition, and .85, .90, and .93 in the distant condition. This pattern was replicated further in the "meeting people" domain, in which RSQ values of .57, .68, and .82 in the near condition were exceeded by the corresponding values in the distant condition, .69, .82, and .85.

Thus, consistent with CLT, near future preferences had a more complex structure than distant future preferences and were more difficult to reduce to few underlying dimensions. These results provide support for the idea that people think more schematically about the more distant future. It seems that as one gets closer in time to experiencing future events, evaluations of those events become increasingly more influenced by nonschematic aspects of those events, which are more difficult to model in a simple way.

General discussion

Using different operationalizations of level of construal, the present studies suggest that the same objects, events, and experiences are construed at a higher level when they are anticipated in the distant future rather than the near future. The findings demonstrate that objects in more distant future situations are classified into broader categories (Study 1), positive and negative experiences in the more distant future are expected to be more prototypical (Study 2), more distant future coping experiences are less variable (Study 3), and more distant

future preferences are organized around simpler structures (Study 4). Taken together, these studies provide convergent evidence for the principle of temporal construal, namely, that temporal distance systematically changes the way actions and events are represented, so that the more distant future is represented in a more schematic, abstract and coherent way.

It is possible that in our studies people perceived the near future as more important and relevant and therefore were more involved in construing near future events than distant future events. High involvement, self-relevance and effort, in turn, enhance the tendency to engage in more systematic, effortful (as opposed to heuristic, low-effort) processing (e.g., Chaiken, Liberman, & Eagly, 1989). In our results, one could say that the broader categorization (Study 1) and lower differentiation (Study 3), which were applied in construing the more distant future, were, indeed, less effortful. However, not all the aspects of our results are consistent with this idea. For example, in Study 2, participants in the distant future condition did not generate fewer events than participants in the near future condition as would be expected if the distant future simply involved less effortful processing. Also, in both Studies 2 and 4 the distant future was in fact more structured (i.e., involved more intra-category differentiation, clearer factorial structure) than the near future. In future research, it would be interesting to examine response time as an independent measure of effort, and potentially show the effect of time perspective on level of construal independent of its potential effect on processing time.

It is interesting to examine also the theoretical relation between level of construal and the heuristic vs. systematic processing distinction. We would like to propose that high-level construals are sometimes but not always less effortful than low-level construals. In fact, abstraction and integration often involve investing an extra processing effort, as is the case, for example, in abstracting rules or theories from raw data. A related distinction is that high-level construal involves retaining important, central features and disregarding incidental features, whereas heuristic processing involves retaining easy-to-process features and disregarding features that are more difficult to process. Obviously, importance does not always correspond to ease of processing. In fact, many examples of heuristic cues refer to relatively unimportant, secondary aspects (e.g., the attractiveness of the source of a persuasive message). In such cases CLT would predict less impact of the heuristic cue on the more distant future, whereas associating the distant future with heuristic processing would lead to the opposite prediction.

It is also interesting to examine the relations between CLT and Gollwitzer's action phase theory (1990), which proposes that in a pre-decisional, deliberation stage, people engage in open-minded and effortful processing

but after they decide to act and thus enter the implementation stage, people tend to create a less differentiated, more evaluatively homogeneous view of the action in question. Because deliberation obviously precedes implementation and is thus more temporally distant from an action, the implications of action phase theory seem opposite to those of CLT. In this respect it is important to note that the effects of temporal construal are independent of action phases, that is, they may occur within an action phase or when actions are not considered at all (e.g., construal of actions by other people). In other words, action phase theory, unlike CLT, is a theory of temporally-ordered stages, but it is not a theory of temporal distance per se.

Temporal distance as a determinant of construal-related phenomena

The principle of temporal construal suggests that temporal distance may moderate various other phenomena related to level of construal. For example, the literature on causal attribution of behavior distinguishes between dispositional and situational attributions (Heider, 1958; Kelley, 1967). A consistent finding in this literature has been that in explaining the behavior of others, people tend to favor dispositional attributions over situational attribution, a phenomenon labeled the fundamental attribution error (Ross, 1977) or correspondence bias (Jones, 1976; for a review see Gilbert & Malone, 1995). Because trait explanations tend to be more abstract than situational explanations (Semin & Fiedler, 1988; Semin & Smith, 1999), the principle of temporal construal would suggest that people would explain distant future behavior in terms of traits (e.g., "she is lazy") and near future behavior in terms of specific, situational causes (e.g., "no place offered her fair employment"). Thus, CLT predicts that temporal perspective would moderate the fundamental attribution error.

A recent series of experiments by Nussbaum et al. (2001a) supports this prediction. For example, in one of the studies participants read an essay favoring Israel's withdrawal from Lebanon. Situational demands were varied by informing participants whether the writer had or did not have choice regarding the content of the essay. Based on this information, participants predicted the likelihood that the writer would express pro-withdrawal attitudes in either the near future or the distant future. Consistent with CLT, we found that situational demands attenuated participants' confidence in making near future predictions of essay-congruent behavior, but not distant future predictions of essay-congruent behavior. The correspondence bias, that is, the tendency to construe behavior in terms of general enduring dispositions, was thus stronger in making distant future predictions than near future predictions. Interestingly, similar findings have been obtained in research on the effect of past

temporal perspective on dispositional inferences. This research found that distant past behaviors tend to be explained in dispositional terms more than recent past behaviors (Frank & Gilovich, 1989; Funder & Van Ness, 1983; Moore, Sherrod, Liu, & Underwood, 1979; Nigro & Neisser, 1983; Peterson, 1980; but see Burger, 1986).

The principle of temporal construal is also relevant to counterfactual thinking. The literature on counterfactual thinking examines how people mentally construct alternatives to reality. It has been suggested that counterfactuals alter a small number of highly mutable details of actual events and thus tend to remain close to the original event (Kahneman & Miller, 1986). Possibly, high-level representations would be less mutable because they are more abstract (have less mutable features) and their features tend to be more central. This, in turn, would make it more difficult to generate counterfactuals for distant future events than for near future events. Moreover, once generated, counterfactuals for more distant events would be less similar to the original event. For example, researchers would be less likely to think of many alternative outcomes of an experiment the more distant it is. At the same time, however, for the more distant experiment they would be more inclined to think that in case of failure they might modify the theory (a substantial change) rather than the method (a more minor change).

A variety of prediction errors are viewed as being the result of schematic, or, in our terms, high-level construals. Specifically, researchers of overconfidence (Dunning, Griffin, Milojkovic, & Ross, 1990; Griffin, Dunning, & Ross, 1990), the planning fallacy (Buhler, Griffin, & Ross, 1994; Kahneman & Lovallo, 1991; Kahneman & Tversky, 1979), and focalism (Wilson et al., 2000) explain these biases as the result of underweighting the influence of specific, contextual, non-schematic factors. CLT would therefore propose that these biases would be more pronounced in making predictions about the more distant future. Consistent with this proposal, Nussbaum et al. (2001b) found greater overconfidence in predictions for the distant future than predictions for the near future.

Implications of temporal construal for intertemporal evaluation and choice

The implications of temporal construal for evaluation and choice have been the most intense area of our research. We suggested that the perceived value of an event derives from its construal, and that if the value of a high-level aspect of a target object is different from the value of its low-level aspects, then changing the level of the representation of the target object (e.g., by changing temporal distance) would result in a corresponding change in its perceived value. For example, the schematic, prototypical representation of a vacation (e.g.,

dining in a scenic restaurant) may be more positive than its contextual, non-schematic representation (e.g., waiting in line to get on the plane), and therefore a vacation in the distant future may seem more positive than a vacation in the near future. This and related predictions of CLT have been extensively explored and largely supported. More specifically, we showed that in the more distant future central and goal-related features of alternatives received more weight than secondary and goal-irrelevant features (Trope & Liberman, 2000), that desirability received more weight than feasibility (Freitas, Salovey, & Liberman, 2001; Liberman & Trope, 1998) and that in choosing bets, payoffs received more weight than probabilities (Sagristano et al., 2001).

Other perspective-dependent construals

We believe that temporal distance is an important but not the sole determinant of level of construal. For example, enactment difficulty was suggested to instigate a lowering of the construal level of the action in question (Vallacher & Wegner, 1987, 2000). In addition, distal perspectives other than future temporal perspective may be associated with higher-level construals. Closely related to CLT is the idea that a distant past perspective is associated with higher construal levels. This idea is in line with the assumption that concrete details fade away from memory more rapidly than general abstractions (Bartlett, 1932; Hastie, 1981; Hastie, Park, & Weber, 1984; Wyer & Srull, 1986), so that memories of the distant past tend to be more abstract than recent memories. Consistent with this idea, Ross (1989) demonstrated that memories of the distant past are reconstructed according to abstract theories about the domain in question (see also McDonald & Hirt, 1997; Mitchell et al., 1997). For example, people recollect being healthier in their youth than they actually were if they subscribe to the theory that health deteriorates with age (Ross, 1989). Related to this proposal is Semin and Smith's (1999) demonstration of the reverse causal direction, namely, that more abstract construals produce more distant memories. These authors find that when prompted with abstract verb-terms (e.g., "please remember an instance of behaving in a helpful way") as opposed to concrete verb-terms (e.g., "please remember an instance of helping someone"), people retrieve examples of more distant past behaviors.

Although these effects of past temporal distance are consistent with CLT, they may result from differential retention of high-level vs. low-level information in memory rather than differential construal of the retained information (Bartlett, 1932; Hastie, 1981; Hastie et al., 1984; Wyer & Srull, 1986). For example, information about concrete behaviors and situational constraints may be lost from memory over time more rapidly than more abstract trait information. If so, describing distant past behavior in terms of abstract traits rather than concrete behaviors may be due to memory processes rather than differences in construal (Hastie, 1981; Hastie et al., 1984). Disentangling the effects of time perspective on construal and on memory would be an interesting direction for future research. For example, such research could assess the effect of temporal distance on the level of people's construals of inferred or imaginary past events (i.e., events people did not experience and thus could not have forgotten).

Level of construal may also be related to social perspective, such as self vs. other, ingroup vs. outgroup, and familiar other vs. unfamiliar other. Social cognitive research is consistent with the notion that more abstract construals are applied to other people and outgroup members as compared to self and ingroup members. Many studies have documented the actor–observer bias—the tendency to explain others' behaviors in dispositional (high-level, abstract) terms and one's own behavior in situational (i.e., low-level, concrete) terms (Fiedler, Semin, Finkenauer, & Berkel, 1995; Jones, 1976; Jones & Nisbett, 1972; for a review see Robins, Spranca, & Mendelsohn, 1996). Similarly, research on group perception suggests that outgroups are construed more schematically than ingroups. Compared to ingroups, outgroups are perceived as more homogenous (Jones, Wood, & Quattrone, 1981; Park & Judd, 1990; Park & Rothbart, 1982), less differentiated into subgroups (Brewer & Lui, 1984; Linville, 1982; Park, Ryan, & Judd, 1992), as possessing more structured, predictable sets of properties (Linville, Fischer, & Yoon, 1996), and are described in more abstract terms (Fiedler et al., 1995; Werkman, Wigboldus, & Semin, 1999).

An interesting direction for future work is to conceptualize future and past temporal distance, the various instances of social distance (self vs. other, ingroup vs. outgroup, in-role vs. out-of-role), and possibly other distance dimensions (e.g., spatial distance, similarity), within a unified theory of psychological distance, in line with Lewin's field theory (Lewin, 1951). Such unified theory would suggest that similar principles of level of construal apply across different dimensions of distance. For example, one would predict, borrowing from the literature on perception of ingroups vs. outgroups, more heterogeneous perceptions of the near future and the recent past (as compared to the distant future and past), of geographically proximal (as opposed to distal) stimuli, and of others that are similar to oneself (as compared to others that are dissimilar to oneself). A unified theory of psychological distance would also allow us to examine the interrelations among the different dimensions of distance. For example, it is possible that the different dimensions of distance act in a compensatory way, which would imply, for example, that one can use another person's perspective to overcome the tendency to con-

strue near future events in low-level terms. It is also possible that moving a stimulus on one dimension of psychological distance may cause people to perceive the stimulus as being more removed on other dimensions as well. For example, geographical distance may foster perceptions of dissimilarity, dissimilarity may foster perception of social distance, etc. Research on these issues can significantly extend past research on time perspective.

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