High Level of Construal and Psychological Distance Reduce Melioration†

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ABSTRACT

We examined how level of construal and psychological distance affected performance in a task in which value of alternatives depended on frequency of choice. Melioration, a sub-optimal choice strategy that fails to take into account such value changes, has been found to be prevalent and difficult to change. Participants repeatedly chose between two buttons to earn as many coins as possible. Button A earned N coins, button B earned N + 3 coins, and N was the number of A presses in the last five trials. In this situation, B has a higher immediate payoff, but because choosing A increases the return from both buttons for the next five trials, maximizing A choices is the optimal strategy. We predicted that because a global perspective is needed to appreciate the dependency of value on frequency of choice, frequency of choosing the globally maximizing alternative (A) would increase when participants apply a higher level of construal and assume a more psychologically distal perspective. Study 1 manipulated construal level through segmenting the sequence of trials into segments of different size, with bigger segments representing higher level of construal. In Study 2, participants played a practice game, and we manipulated the probability of playing the actual game. Both a higher level of construal and a lower probability of playing the actual game (higher distance) increased the number of A choices. These results suggest that a broad perspective that is induced by high level of construal or by psychological distancing may reduce sub-optimal, meliorating choice. Copyright © 2014 John Wiley & Sons, Ltd.

KEY WORDS construal level theory; psychological distance; self-control; melioration; inter-temporal choice; learning

INTRODUCTION

“Internalities”: When utility of alternatives depends on choice frequency

Imagine a colleague who constantly complains about everything—the hiring procedures, level of the students, university administration, lab space, office space, noise in the corridors, and the condition of the bathrooms. Each complaint is somewhat likely to draw attention and thus has the potential to improve the situation. At the same time, however, complaints also gradually weaken the impact of each subsequent complaint. The colleague thus has to weigh the beneficial outcomes of each complaint versus its aggregated negative impact on the effectiveness of future complaints, which, in turn, requires taking into account the cumulative, as opposed to only the immediate effect of complaining. Consider, as another example, a student who has just started learning touch typing: He or she is faced with the frustration of the initial cost in typing speed. He or she has to recognize, however, that with practice and perseverance, the new behavior will become less costly and more beneficial. The frequency of performing a behavior may change not only its instrumental value, as in these two examples, but also hedonic value. For example, frequent consumption of any type of food typically reduces the enjoyment one derives from that food. The term “internality,” which we will use through the paper, refers to situations in which the utility of an alternative depends on the frequency of its choice (e.g., Herrnstein et al., 1993), that is, on factors within the process of decision (in contrast to the more common case, in which utility is defined by external factors, which are independent of the decision process.)

Does the complainer appreciate the fact that repeated complaining reduces the impact of his or her complaints? When learning new, initially difficult actions, do people take into account that repetition would make these actions easier? Do people anticipate changes in hedonic value because of repeated consumption? Research by Herrnstein, Rachlin, and colleagues (Herrnstein & Prelec, 1992; Herrnstein et al., 1993; Rachlin, 1995a) suggests that people tend to underweight the effect of repetition on the value of their actions, and over-select the alternative that gives the larger immediate return even when this leads to a smaller overall return. They used the term “melioration” to describe this behavior, and we adopt this terminology. For example, Yechiam, Erev, Yehene, and Gopher (2003) showed that people fail to learn touch typing because it is initially difficult for them to avoid looking at the keyboard and that learning improves when this difficulty is counteracted by forcing them to look at the computer screen, away of the keyboard.

In laboratory studies of melioration, participants repeatedly choose between two buttons, A and B, and receive points (typically exchangeable for money at the end of the experiment). The payoff structure, which is not exposed to the participants, is that on each trial, choosing B gives a higher return than A (e.g., A gives N points, and B gives N + 3 points) but also reduces subsequent earnings from both buttons (e.g., N is the number of A choices in the last five trials). In this situation, the globally maximizing option is choosing A all the time, and choosing B is indicative of melioration. In the last trials of the experiment (e.g., the last two trials), choosing B

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becomes advantageous because its higher payoffs are no more offset by reduced subsequent earnings.

Using variations of this paradigm, research found that people almost never verbalize the rule, and oftentimes meliorate (Herrnstein et al., 1993). Melioration was found to be difficult to change. For example, Kudadjie-Gyamfi and Rachlin (1996, Study 2) found that participants’ rate of melioration was not reduced by an explicit hint on the long-term disadvantage of repeatedly choosing the locally attractive alternative B. However, other studies found conditions that reduce melioration. Kudadjie-Gyamfi and Rachlin (2002) gave a more salient hint than in their 1996 study and found reduced melioration. Melioration was reduced when internalities followed a simpler rule (e.g., when the optimal strategy was to stick to one alternative rather than to balance between two alternatives, Herrnstein et al., 1993) and when choosing the maximizing option made future returns larger as compared with when it made future returns more likely (Tunney & Shanks, 2002). Stillwell and Tunney (2009) used a variation of the task in which choosing the alternative with the higher immediate payoff ended the session prematurely, thereby providing an especially vivid experience of the global disutility of this alternative. They showed that participants not only learned to avoid melioration but also returned to the immediate-higher alternative B when only a few trials remained, thus demonstrating a particularly good understanding of the payoff structure of the two alternatives.

In view of these and other findings, Stillwell and Tunney (2009) concluded that “melioration behavior is not due to the lure of impulsivity, but due to the difficulty of learning which components are included in the pay-off schedules” (Abstract). What additional factors might facilitate such learning and thus reduce melioration? We suggest one answer to this question on the basis of construal level theory (CLT; for a review see, Liberman & Trope, 2008; Liberman, Trope, & Stephan, 2007; Trope & Liberman, 2010).

Construal level theory

Construal level theory (Liberman & Trope, 2008; Trope & Liberman, 2010) proposes that the way we mentally construe situations may vary in level: Higher level construals are abstract, general and schematic. They pertain to superordinate goals, apply to a broad array of cases, and more selectively include relevant features of objects and events. Lower level construals, in contrast, consist of subordinate, incidental features and represent events and objects as unique and specific (see Shapiro, Liberman, Trope, & Rim, 2012, for a discussion of the level of construal). For example, learning touch typing may be represented as memorizing the location of specific keys (a low-level construal) or as learning a new skill (a high-level construal; Liberman & Trope, 1998; Liberman, Sagristano, & Trope, 2002). As another example, complaining may be construed as a single action, bracketed narrowly in time and space (a low-level construal), or as one in a broad series of similar actions that span across a wider range of time and space (a high-level construal; Rachlin, 1995b).

A key contention of CLT is that because higher level constructs tend to be more stable across psychological distance (i.e., they tend to change less across past and future time, space, alternative worlds, and social perspectives), psychological distance and level of construal are closely intertwined, such that higher level construals enable one to consider more distal objects, and distal objects necessitate higher level of construals (see Liberman & Trope, 2008; Trope & Liberman, 2010, for a more detailed discussion of why level of construal and psychological distance are related). To demonstrate the effect of temporal distance on level of construal, Liberman et al. (2002) gave participants a list of objects. Half of the participants imagined using the objects in the distant future, whereas the other half were asked to imagine using the objects in the near future. When asked to classify the objects into categories, participants generated fewer, broader categories for objects that they imagined using in a distant future situation than for objects they imagined using in a near future situation. Similar effects emerged with hypotheticality: Broader categories were used to group objects that were imagined as part of less likely situations (Wakslak, Trope, Liberman, & Alony, 2006).

Especially relevant to the present framework is a study that examined the effect of hypotheticality on segmentation of ongoing experience (Wakslak et al., 2006). Participants were made to believe they are likely or unlikely to engage in a series of activities they viewed in a movie. Those who were led to believe they are unlikely to engage in the depicted behaviors (i.e., high distance on the hypotheticality dimension), segmented the behavior sequence into wider segments than those who were led to believe they are likely to do so (i.e., low distance on the hypotheticality dimension). Fujita, Henderson, Eng, Trope, and Liberman (2006) demonstrated a similar effect of spatial distance on segmentation of ongoing behavior.

We think that appreciating the dependence of the value of an action on the frequency of its choice would be facilitated by a high-level construal of the situation and/or a distal perspective on that situation. This is because larger segments, akin to high-level of construal, are needed to note the dependence. For example, in order to appreciate the fact that repeating an action makes it easier, one needs to compare how difficult it was to perform the action initially to how difficult it was to perform it later. Using smaller segments to construe one’s stream of behavior (e.g., viewing each action in isolation) does not allow for such comparison. On the basis of CLT’s notion of the relation between high-level construal and psychological distance, we predict that psychological distancing would also reduce melioration.

Our view of the effect of level of construal on melioration is related to Rachlin’s behavior patterning theory (Rachlin, 1995a, 1995b), which conceptualizes overcoming melioration, and self-control more generally, as an abstract behavioral pattern dominating a particular act (see Fujita, Trope, & Liberman, 2010, for a discussion of the relation between behavior patterning and CLT’s view of self-control). Although both Rachlin’s (1995a, 1995b) behavior patterning theory and CLT suggest that a global, molar perspective on one’s actions would reduce melioration, the former theory comes from a behavioral tradition, whereas CLT is rooted.
in cognitive approaches. Reflecting these different traditions, patterning is typically conceptualized as a characteristic of the stimulus, usually achieved by introducing temporal intervals in a stream of events, whereas level of construal refers to mental representation. We return to this point in the discussion of Study 1, which is most closely related to patterning. Also reflecting the difference between behavioral and cognitive traditions, Rachlin (1995a, 1995b) views melioration as a problem of response control similar to other self-control situations, such as not eating when on a diet, whereas we prefer to view melioration in a way similar to Stillwell and Tunney (2009), as a problem of learning global contingencies. We return to this distinction in the general discussion.

The present research

We used a paradigm developed by Herrnstein et al. (1993; see also Tunney & Shanks, 2002). In this paradigm, participants face a repeated choice between pressing one of two buttons, “A” and “B,” which represent two coin hoppers. At each trial, after choosing A or B, the participant sees the return from his or her choice, and the goal is to earn as much money as possible. We used a version of the game in which button A earns \( N \) coins and button B earns \( N + 3 \) coins, where \( N \) is the number of A choices in the previous five trials. In this algorithm, on each trial, button B is better than A because it earns three points more. Yet, the optimal strategy is to maximize the frequency of A choices, because each choice of A adds one point to each of the buttons over the following five trials. Participants are not told about the rule that determines earnings and can rarely verbalize the rule at the end of the experiment (Herrnstein et al., 1993). Nevertheless, with repeated experience, they learn at least in some conditions to meliorate less.

We manipulated construal level (Study 1) and hypotheticality (Study 2) and predicted that participants in the high construal level condition (Study 1) and participants in the psychologically distant condition (Study 2) would meliorate less and as a result would earn more money compared with participants in the low construal level condition and in the psychologically proximate condition.

In both studies, we assessed mood and attentiveness/motivation after participants completed the task. Past research has found that positive mood, relative to negative or neutral mood, promotes more global, as opposed to local, processing (e.g., Gasper & Clore, 2002). More directly related to our studies, Gray (1999) showed that negative emotional states made participants meliorate more than participants in a neutral emotional state. The positive mood and negative mood indexes of the Positive and Negative Affect Schedule (PANAS) mood measure were used to control for the possibility that distancing and high level of construal enhanced positive mood or reduce negative mood. We also controlled for the possibility that high level of construal and distancing could have affected participants’ level of involvement in the task. For that purpose, we constructed an attentiveness scale using three items from the PANAS (attentive, alert and determined), in a way similar to Watson, Clark, and Tellegen (1988). In addition, in Study 2, we included a self-report question on motivation.

STUDY 1: THE EFFECT OF CONSTRUAL LEVEL ON MELIORATION

As noted earlier, prior research on level of construal conceptualized dividing a stream of experience into large segments (versus smaller segments) as an instantiation of using higher level construal (Wakslak et al., 2006). In real life, too, when pausing to think of their past experiences, people may generate smaller, more frequent summaries or larger, less frequent summaries (e.g., pause to think about their experiences each day or only each year). We thus used size of segments in order to manipulate level of construal in our study. Specifically, we segmented the choice sequence into segments of 5, 15, 75, or 210 trials per segment, depending on the experimental condition, by providing summary information after each segment. We predicted that larger segments (higher level of construal) would reduce melioration and increase earnings.

Method

Participants

Seventy-one undergraduate students (15 men) from Tel Aviv University, enrolled in an Introductory Psychology course, participated in the study in exchange for course credit. Age ranged from 18 to 31 years (M = 23.01, SD = 2.25). Participants were randomly assigned to conditions.

Procedure

Upon arriving at the lab, participants were told that they are going to play the “Money Machine” game and were seated in front of a computer screen showing two coin hoppers and buttons marked “Hopper A” and “Hopper B” (Figure 1). Next, participants were handed a page with the following game instructions:

Figure 1. The “Money Machine” screen
You are about to operate a Money Machine. The amount of money you will earn depends on your ability to operate it. The Money Machine has two coin hoppers. On each trial you will click on one of the hoppers and by that earn some money. The number of coins you earned on that trial will be indicated above the hopper you chose. The total number of coins that you earned up to that point will be presented in the “profit counter” at the bottom of the screen. Each coin is worth 1 Agora {.01 of a NIS}. Use the computer mouse to click on the hoppers. The amount in the profit counter is yours. The experiment will begin with 75 practice trials. What you earn during the practice trials will not be counted towards your earnings. After you complete the practice trials you will have 210 trials to operate the machine. As noted before, the amount you will earn during these 210 trials will be yours at the end of the experiment.

Because we were interested in moderators of melioration and because previous studies showed that often melioration remains a dominant choice even after many trials, we chose a version of the task that made it relatively likely that participants would learn to overcome the tendency to meliorate and find the maximizing strategy. Specifically, in our task, frequency of choosing an alternative affected magnitude of earning (rather than the probability of earning or its delay), and the optimal strategy was choosing only A (rather than a mixture of A and B choices; Tunney & Shanks, 2002). To further help participants to overcome melioration, we gave them a hint (Kudadjie-Gyamfi & Rachlin, 1996, 2002). Specifically, we told participants that pressing the buttons not only gives a specific number of coins but also affects the future returns that may be earned by each button. After the hint, the experimenter repeated and explained the game instructions again.

As mentioned earlier, each choice of button A earned \(N\) coins, each choice of button B earned \(N+3\) coins, and \(N\) was the number of A choices in the previous five trials. Participants were not told about these underlying rules. In the course of the experiment, the number of coins earned by each click was presented above the selected hopper for 1 second. The number of trials left and the total number of coins earned were presented on the screen throughout the game.

In order to manipulate level of construal, trials were segmented into segments of four sizes: five trials per segment (Group 1; \(N=18\)), 15 trials per segment (Group 2; \(N=19\)), 75 trials per segment (Group 3; \(N=16\)), and no-segmentation (all 210 trials in one segment; Group 4; \(N=18\)), creating four levels of the independent variable. Segmentation was achieved by presenting, after each segment, the participant’s summary information on his or her performance in that segment. The summary was presented for 10 seconds and included information on which buttons she or he pressed and the amount earned by each press in a table format. The total number of coins earned from each button and the overall number of coins earned during that segment were also presented (e.g., in the last five trials, you earned nine coins, four by pressing B, and five by pressing A). Participants proceeded from trial to trial in a self-paced manner.

Notably, the information we provide to create segments only sums up the participants’ behavior and its outcomes, both of which were known to the participant on a trial-by-trial basis. In that sense, we only provide an overview and a summary of known information, rather than giving novel information. After participants finished the game, they completed the PANAS (Watson et al., 1988), after which they were debriefed, thanked for participating, and assigned the appropriate course credit. They were paid, in addition, the amount they earned in the game.

**Results and discussion**

We analyzed the number of globally maximizing (A) choices in a one-way analysis of variance (four segment sizes)\(^1\) and found a significant effect, \(F(3, 67)=2.94, p=.04, \eta^2=.12\). A further linear contrast analysis revealed a significant linear trend, \(F(1, 67)=8.63, p<.001\), with more globally maximizing (A) choices with increasing segment size (Figure 2). Planned contrasts revealed significant differences only between non-adjacent conditions: 5-trial segments versus 75-trial segments, \(t(67)=-2.18, p=.017\); 5-trial segments versus no segments, \(t(67)=-2.73, p=.004\); 15-trial segments versus no segments, \(t(67)=-1.62, p=.054\).

We examined how the probability of choosing A changed through the course of the study, separately for each condition (Figure 3).\(^2\) To reduce noise, we averaged together every successive five trials.

Figure 3 shows that in all experimental conditions, the probability of choosing the globally maximizing (A) alternative increased, indicating learning to avoid melioration in the course of the experiment. We fitted a linear regression line to each condition. When doing that, we excluded the last point, because of a computer failure, data from trials 150 and in the 75-trials segment condition were not recorded on a trial-by-trial basis. We still have the overall number of A choices for that condition (presented in Figure 2) and the trial-by-trial data up to that point (presented in Figure 3).

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\(^1\)Amount earned was strongly correlated with number of A choices, \(r=.984\), and showed similar results in both this and next studies.

\(^2\)Because of a computer failure, data from trials 150 and in the 75-trials segment condition were not recorded on a trial-by-trial basis. We still have the overall number of A choices for that condition (presented in Figure 2) and the trial-by-trial data up to that point (presented in Figure 3).
because some of our participants shifted to B in the last trials, demonstrating a good understanding of the underlying rule (see Stillwell & Tunney, 2009, for a similar result). All the slopes were significantly positive, all ps < .001. Moreover, the slope was steeper in the no-segments, high-level construal condition, $B = .006$, $t(40) = 10.84$, $p < .0001$, than in both the 15-trial segments condition, $B = .003$, $t(40) = 3.69$, $p = .001$, and the 5-trial segments condition, $B = .003$, $t(40) = 4.80$, $p < .0001$, which did not differ from each other, $t(40) = .202$, $p = .841$. The differences in slopes indicate that segmentation interfered with learning. Probably, because segmentation summarized choices and their outcomes in the last trials, it made participants base their subsequent decisions on these last trials. Without such feedback, they were more likely to base their assessment on the entire session up to that point.

Our manipulation of level of construal via segmentation confounded frequency of feedback with its content, such that more frequent feedback summarized fewer trials. Although both bigger segments and a broader range of summarized information constitute higher level construals, it is important to show that segmentation did not reduce performance by mere distraction. Thus, in order to better understand the effect of segmentation on performance, we examined behavior within each segment in the 5-trial segment condition and the 15-trial segment condition. Specifically, we looked how the average rate of choosing A changed as a function of distance from feedback in these two conditions, excluding the first segment (which preceded any feedback) and the last segment (because, as noted before, some participants shifted to B in the last few trials, demonstrating a good understanding of the underlying rule; Figure 4).3

The pattern in Figure 4 is not consistent with the possibility that feedback simply interfered with a tendency to choose the globally maximizing alternative—if that were the case, the graphs would have had a positive slope, showing more melioration (i.e., less A choices) immediately after feedback than farther away from it. In fact, in the 5-trial segments condition, the reverse was true, namely, the rate of choosing the globally maximizing, A alternative was high immediately after feedback and decreased farther away from it, $B = −0.05$, $t(4) = −7.51$ $p = .005$ for the downward linear slope. It seems that in this condition, feedback actually increased A choices, but its effect quickly wore off.5 We can only speculate why the slope was negative in the frequent feedback condition. One possibility would be that participants apply what they learned from feedback for a number of trials that is influenced by the number of trials that is summarized in the feedback. Thus, when feedback is on the last five trials, they apply it for two trials, but when feedback is on the last 15 trials, they apply it for longer.

We did not find differences between conditions in positive mood ($M = 2.42$, $SD = .61$; $M = 2.75$, $SD = .77$; $M = 2.52$, $SD = .44$; $M = 2.57$, $SD = .44$, for conditions of increasing level of construal), $F(3, 58) = .81$, $ns$; negative mood ($M = 1.37$, $SD = .38$; $M = 1.44$, $SD = .44$; $M = 1.24$, $SD = .30$; $M = 1.33$, $SD = .31$, for conditions of increasing level of construal), $F(3, 58) = .83$, $ns$; or attentiveness ($M = 2.96$, $SD = .76$; $M = 3.13$, $SD = .76$; $M = 2.94$, $SD = .73$; $M = 3.26$, $SD = .49$, for conditions of increasing level of construal), $F(3, 58) = .72$, $ns$.

In sum, the results of this study are consistent with the prediction that a higher construal level would reduce melioration. Participants who received more frequent feedback, which segmented their ongoing experience into smaller segments, meliorated more than participants who

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5The slope in the 75-trials segments condition was also significant and no different than in the no-segments condition, $B = .006$. However, because of data loss in this condition, comparisons to this condition had to rely on partial data and were thus less informative.

6The 15-trials segments condition did not show a significant downward trend, and its slope was only marginally different from the 5-trials segments condition.
received less frequent summaries and thus could group their experiences into larger segments. Participants in all conditions gradually learned to avoid melioration in the course of the experiment. Learning, however, was slower in conditions of lower level construal, indicating that frequent feedback, which we used to create low-level, small segments of experience, interfered with accumulation of experience. Frequent feedback did not have an immediate negative effect on performance, as would be expected if it was a simple distraction effect. Rather, it interfered with accumulation of experience because performance deteriorated on trials that were farther away from feedback.

At first sight, our results might seem at odds with the general notion that feedback improves performance (e.g., Balzer, Doherty, & O’Connor, 1989) as well as with studies that specifically showed less melioration with increased levels of feedback (Warry, Remington, & Sonuga-Barke, 1999). A closer examination of these studies, however, reveals a fundamental difference: Warry et al. (1999) gave participants in the feedback conditions information on how experts performed the task and on the earnings they could have made had they selected the other alternative. Our feedback, on the other hand, only summarized participants’ performance in the past segment. We think that frequent feedback in our study simply made participants assume a narrower, more local view on their experience, thereby naturally making melioration more likely. Relatedly, we would like to emphasize that not every “no feedback” situation necessarily facilitates a global perspective. Perhaps the global accumulation process in our study was helped by the fact that participants knew the total number of trials and the current trial number through the course of the experiment (Figure 1). Perhaps it was also helped by the perceptual similarity of the trials to each other. Future research is needed to examine these questions.

It is also interesting to consider this experiment from the perspective of Rachlin’s theory of patterning of behavior (1995a, 1995b) and Kudadjie-Gyamfi and Rachlin’s (1996) finding that temporal patterning of behavior reduced melioration. In their study, patterning was operationalized as introducing a temporal interval every three trials versus every single trial or not introducing delays at all. What would this theory predict regarding the effect of increasingly larger temporally patterned segments? We think that there is no clear answer. On the one hand, larger temporal segments afford a more molar, global view, but on the other hand, they are more likely to “fall apart”—within a larger segment, it is more difficult to treat individual acts as related to each other to form a gestalt.

It is perhaps difficult to compare our cognitive manipulation of segmentation to temporal patterning of behavior. If, however, this difficulty notwithstanding, we draw such comparison, an inconsistency becomes apparent between our findings and those of Kudadjie-Gyamfi and Rachlin (1996). Namely, whereas in their study patterning decreased melioration relative to the no-patterning condition, in our study, segmentation increased melioration relative to the no-segmentation condition. As a first step in our attempt to resolve this inconsistency, we would like to note that our no-segmentation condition was easier (i.e., less prone to melioration), elicited more learning, and possibly was more conducive to spontaneous patterning or high-level construals than the no-patterning condition in Kudadjie-Gyamfi and Rachlin’s (1996) study. 6 This is evidenced both by a

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6A few differences between the two experiments probably contributed to making our no-segmentation condition easier than Kudadjie-Gyamfi and Rachlin’s (1996) no-patterning condition. (i) In Kudadjie-Gyamfi and Rachlin (1996), internalities were produced by delay: The delay to receive the outcome, which was always one point, was N seconds after choosing B and N + 3 seconds after choosing A, and N was the number of B choices in the previous 10 trials. In our studies, internalities were constructed upon a more easily discriminable dimension, namely, number of points: By choosing A, participants earned N coins; by choosing B, they earned N + 3 coins, and N was the number of A presses in the previous five trials. (ii) The “window” of melioration was wider in Kudadjie-Gyamfi and Rachlin (1996) than in our experiment: 10 trials versus 5 trials. (iii) Unlike in Kudadjie-Gyamfi and Rachlin’s study, we gave participants a hint—we said that the value of the alternatives may depend on the frequency of their choice.
much higher overall rate of selecting the globally maximizing alternative in our no-segmentation condition (70%) than in the no-patterning condition in Kudadjie-Gyamfi and Rachlin’s (1996) study (14%, calculated as 15 out of 108, which is the maximum possible number of trials, given an overall length of 325 seconds and a shortest trial of 3 seconds) and by the fact that a process of learning and experience accumulation occurred in the course of our experiment but not in Kudadjie-Gyamfi and Rachlin’s (1996) study.

A separate question is whether, according to Rachlin’s (1995a) action patterning theory, the relatively low rate of melioration in our no-segmentation condition should have been reduced even further by segmentation. The answer depends on whether one thinks of patterning in cognitive terms, as a mental state or in behavioral terms, as a property of the stimulus. Patterning, as operationalized in our study, can be expected to reduce melioration only in the latter case. Our results are thus consistent with a cognitive view of patterning more than with a behavioral view of this construct.

STUDY 2: THE EFFECT OF PROBABILITY OF PLAYING ON MELIORATION

We replicated Study 1 but this time manipulated probability instead of level of construal. Specifically, all the participants played a simulation of the game and were told that they were very likely to play the actual game (high probability, proximal condition) or not very likely to play the actual game (low probability, distal condition). According to CLT, a low probability affords a broader perspective of experiences, and thus, we thought, would promote recognizing the advantage of choosing the globally maximizing alternative A. We thus predicted that low probability would reduce melioration compared with high probability.

Method

Participants

Thirty-two undergraduate students (seven men) from Tel Aviv University, enrolled in an Introductory Psychology course, participated in the study in exchange for course credit. Age ranged from 19 to 31 years ($M = 23.28$, $SD = 2.47$). Participants were randomly assigned to conditions.

Procedure

The procedure was similar to that of Study 1, except that this time before beginning the experiment, participants were told they would play a simulation of a game that would be followed by the actual game with either high probability (in the proximal condition) or low probability (in the distal condition). Specifically, the experimenter showed each participant a basket full of folded notes and explained that upon completion of the simulation session, he or she would draw a note from the basket and that this note would determine the next stage of the experiment. Depending on the experimental condition, they were told that the basket has 95 (5 notes that say “continue to the next part” and 5 (95) notes that say “thank you and goodbye.” Trials were segmented into groups of 15, and there was no practice session. The experiment consisted of 210 trials.

Upon completing the game, all the participants drew a “thank you and good bye” note from the basket, completed the PANAS (Watson et al., 1988) as in Study 1, and rated, in addition, the extent to which they were motivated to earn as many coins as possible on a scale that ranged from 1 (not motivated at all) to 7 (very motivated). Because participants only played a simulation game, no monetary payoff was assigned. Thus, at the end of the experiment, participants were debriefed, thanked for participating, and assigned the appropriate course credit.

Results and discussion

As predicted, a low probability of taking part in the actual game (high distance) resulted in higher rates of global (A) choices ($M = 127.06$, $SD = 32.99$) than a high probability (low distance; $M = 95.87$, $SD = 35.03$), $t(30) = 2.59$, $p = .02$, $d = .92$.

No differences were found between conditions in positive mood (low probability: $M = 2.46$, $SD = .62$; high probability: $M = 2.40$, $SD = .49$), $t(30) = .31$, $ns$; negative mood (low probability: $M = 1.53$, $SD = .78$; high probability: $M = 1.35$, $SD = .48$), $t(30) = .79$, $ns$; attentiveness (low probability: $M = 2.77$, $SD = .73$; high probability: $M = 2.96$, $SD = .47$), $t(30) = .87$, $ns$; or stated motivation to earn as many coins as possible (low probability: $M = 5.06$, $SD = 1.48$; high probability: $M = 5.12$, $SD = .96$), $t(30) = .14$, $ns$.

As expected, participants who believed that they were unlikely to take part in the actual game meliorated less than participants who believed that they were likely to take part in the actual game. Positive mood, negative mood, attentiveness, and motivation did not differ between conditions and thus cannot account for these results. We think that low (vs. high) probability of playing the actual game made participants assume a broader perspective on their experience, and therefore allowed a better recognition (however implicit) of the dependence between frequency of choosing an alternative and its value.

Our results suggest that practice, being distant from actual performance, might reduce melioration more than actual experience of a similar extent. Consistent with this possibility, Tunney and Shanks (2002) showed that an un-reinforced practice block of 100 trials reduced melioration on subsequent trials more than a reinforced block of 100 trials (i.e., performance on Block N after practice was better than performance on Block N + 1 without practice). More generally, these results raise the possibility that practice, more than actual experience, affords a global perspective on the situation and thus would be more beneficial whenever performance depends on adopting such perspective. This possibility should be examined in future research.
Two studies examined participants’ performance in a task that involved repeated choice with “internalities,” namely, a procedure in which the value of alternatives depended on the frequency of their choice. Specifically, two buttons (A and B) represented two coin hoppers, and button B was better than button A on each specific trial (because button A earned $N$ coins, whereas button B earned $N+3$), but at the same time maximizing A presses was the optimal strategy, because $N$ was the number of A presses in the last five trials (Herrnstein et al., 1993). Past research with similar paradigms showed that participants frequently fail to optimize and instead meliorate by choosing the B button that gives higher immediate returns. Based on CLT (Liberman & Trope, 2008; Trope & Liberman, 2010), we predicted that because a global perspective is needed to appreciate the dependency of value on frequency of choice, melioration would be reduced under a higher level of construal and when participants assume a more psychologically distant perspective on the experience. Two studies tested this prediction.

In Study 1, we manipulated construal level through segmenting the sequence of trials into segments of different size, with bigger segments representing higher level of construal (Waksler et al., 2006). Higher level of construal reduced melioration. The pattern of choices in the course of the experiment and within each segment suggests, furthermore, that segmentation slowed down the process of learning and that this was not due to simple interference with an established tendency to choose the globally maximizing alternative. In Study 2, participants played a practice game, and we manipulated the probability of playing the actual game. A low probability of playing the actual game (high distance on the hypotheticality dimension) reduced melioration and increased returns relative to high probability (low distance on the hypotheticality dimension). In both studies, mood and attentiveness did not mediate the effect. Stated motivation, which was gauged in Study 2, also did not mediate the effect.

**Melioration versus other types of self-control**

The task used in our studies, as have been other situations that involve internalities, may be and has been viewed as a self-control problem (e.g., Rachlin, 1995a, 1995b; Tunney & Shanks, 2002). Like the dilemmas between dieting and indulging food, between studying and partying, and between saving and spending, the task we used involved a conflict between an action that gives higher return in the short run and an action that has higher overall utility. Melioration, in this view, is akin to other types of succumbing to temptation, such as indulging food, partying, and over-spending. Indeed, Rachlin’s (1995a, 1995b) analysis of melioration conceptualizes it, in line with the behavioral tradition, as a problem of action control that is similar to other situations in which one has to control impulsive behavioral tendencies for the sake of a better outcome that is uncertain, delayed, or distributed over time.

Despite this general similarity to other self-control tasks, we think that melioration paradigms have a number of properties that make them worthy of special attention. First, many self-control situations that have been studied in the laboratory rely on contingencies that participants learned and contemplated upon in their life prior to the experiment. For example, studies on dieters’ self-control when consuming food (Herman & Polivy, 2011; see also for example, Fishbach & Zhang, 2008) rely on contingencies between enjoyment and eating as well as between eating and gaining weight that the participants learned, struggled with, and much talked about prior to the study. In contrast, in melioration paradigms such as the one used in our experiments, contingencies are learned via direct experience in the lab, and no explicit linguistic summary is offered.

A second aspect of the melioration paradigm that makes it distinct from many studied self-control situations has to do with the distinction between identifying the self-control conflict (either explicitly or implicitly) and implementing self-control strategies (Myrseth & Fishbach, 2009). Specifically, in melioration studies, recognizing the internalities might be difficult, and therefore understanding the conflict between the two alternatives is a challenge (Stillwell & Tunney, 2009). Further contributing to this difficulty is the fact that in melioration the delayed reward is distributed over time rather than occurring at a specific time point, which might further complicate learning the tradeoff, especially in the absence of an explicit verbal articulation of the conflict. Unlike in melioration studies, in many classic self-control situations, people readily acknowledge the disadvantage of the temptation (e.g., that rich desserts make you fat, that partying stands in the way of studying, and that spending is detrimental to saving). In these situations, it seems, the problem is controlling one’s impulsive responses (Metcalfe & Mischel, 1999; Mischel, Shoda, & Rodriguez, 1989).

We are now in a position to consider the present findings in view of extant CLT-related research on self-control. In a series of studies, Fujita and his colleagues have shown that high level of construal enhances self-control (Fujita, Trope, Liberman & Levin-Sagi, 2006; Fujita & Carnevale, 2012; Fujita & Roberts, 2010) in a variety of situations including trade-offs between amounts and temporal delay, enduring pain to receive more diagnostic self-relevant feedback, dieting, and smoking. Many studies demonstrated that psychological distance, too, enhances self-control (Freitas, Salovey, & Liberman, 2001; Mischel et al., 1989; Thaler & Sunstein, 2008). Fujita, Trope, et al. (2006; see also Fujita & Roberts, 2010) argued that a high-level perspective helps a decision maker to simultaneously represent the temptation and the higher level goal as well as to appreciate the conflict between the two. Their experimental paradigms, however, presented a luring temptation and relied on previously learned, verbally summarized self-control conflicts. The present studies extend Fujita’s work by showing an effect of construal level and distancing on self-control situations in which the challenge comes from identifying an experienced conflict rather than solving a known conflict that is made explicit by a verbal summary.
In sum, although it is entirely possible and consistent with CLT that high level of construal and distance would attenuate the lure of the immediate reward and help to cool it off, the present studies highlight an additional role for level of construal and distance, namely, facilitating the mere recognition of global contingencies. Indeed, in order to appreciate the effect of frequency of choosing an alternative on its value and in order to take it into consideration, a broad perspective is needed (Mysrseth & Fishbach, 2009). We think that high level of construal and distancing facilitates this broader perspective.

Extensions and future directions

On the practical level, our studies suggest that abstraction and distancing could be used to reduce melioration in real-life situations. One should pre-commit to learning touch typing rather than leave it to a local decision. A complainer should consult the perspective of another person (i.e., apply social distancing) before filing the next complaint. Food diversification, too, should be more likely from a distal and more abstract perspective: Whereas local decisions would typically repeat the choice of a favorite food and thus meliorate its utility, global decisions that are made from a distance would favor variation. Interestingly, research on the diversification bias (Simonson, 1990) is consistent with this possibility. Somewhat similar to our segmentation manipulation, Read and Loewenstein (1995) showed that diversification is more likely when choices are bracketed together than when choices are perceived as separate. We could predict that people would seek more diversity (at least in choosing food, where people tend to hold subjective theories of satiation) when they think of others than of themselves, of dissimilar others than of similar others, when they are in a position of power, and when they think of geographically far-away situations. These predictions await examination in future research.

REFERENCES


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