TIME PERSPECTIVE AND THE RELIANCE ON FEELINGS

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ABSTRACT

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Consumer judgments and decisions can be made either in a more cognitive, reason-based manner (by assessing, weighing, and combining attribute information into an overall evaluative judgment) or in a more affective, feeling-based manner (by inspecting one's momentary feelings toward the options). An emerging body of evidence suggests that the two modes of judgment and decision may tap into two separate systems: a reason-based, analytical system and a feeling-based affective system. I propose that the affective system is more likely to be engaged in decisions that are anchored in the present than in decisions that are anchored either in the distant future or in the distant past. Consistent with this proposition, results from nine experiments show that both integral affect and incidental affect carry more weight in decisions about the immediate future or the recent past than in decisions about a more distant future or distant past. In addition, the scope-insensitivity bias associated with affective valuation holds only when people are thinking about the present but not when they are thinking about the future or about the past and when affective information is available in the decision context.
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Chapter 1

Introduction

Existing research has suggested that consumers often act impulsively and make short-sighted decisions. They prefer outcomes with immediate gratifications over outcomes that occur in the future, even when future outcomes may be superior (Ainslie 1975; Mischel 1974; Mischel et al. 1989). Although they make well-reasoned choices when outcomes are distant, consumers become more likely to switch impulsively from their earlier, prudent choices as time gets closer to receipt of the earlier reward. One way to approach a study of the change in preference for outcomes over time is Mischel’s delay of gratification paradigm, whereby researchers investigate how people postpone immediate gratifications in order to attain delayed, but overall more valued, outcomes (e.g., Mischel 1974; Mischel et al. 1989).

This program of research suggests that focusing on affective or “hot” features of an outcome makes people more likely to give into immediate temptation, but focusing on the more cognitive or “cool” features helps to achieve self-control and delay gratification. For example, consumers may feel a strong temptation to consume a chocolate chip cookie offered to them right now and thus are unable to wait for the receipt of two cookies in ten minutes. Based on such observations, Loewenstein (1996) proposes that the differential accessibility of current and delayed affective responses is a primary explanation for myopic choices. Consumers give in to immediate temptations because they are overwhelmed by the intense emotions experienced only with immediate outcomes. In
short, research in this domain argues that the intensity of affective reactions associated with immediate outcomes makes it difficult to exert self-control and delay gratification.

In this dissertation, I propose a situational characteristic of affect in judgment and decision making. An additional contribution of this dissertation is that the newly identified situational mechanism of affect helps provide a different explanation as to why consumers may give in to immediate temptations in the present, and it offers a unique perspective on questions of affective influences on self-control and time-inconsistent preferences.

Consumer judgments and decisions can be made either in a more cognitive, reason-based manner (by assessing, weighing, and combining attribute information into an overall evaluative judgment) or in a more affective, feeling-based manner (by inspecting one’s momentary feelings toward the options). An emerging body of evidence suggests that the two modes of judgment and decision may tap into two separate systems: a reason-based analytical system and a feeling-based affective system (e.g., see Lieberman et al. 2002). However, the conditions under which either system dominates are still unclear. The major proposition of my dissertation is that the affective system is more likely to be engaged in judgments and decisions that are anchored in the present than in comparable judgments and decisions that are anchored in a more distant time horizon, whether future or past. Following the general hypothesis, I propose that the engagement of the affective system in the present time increases reliance on feelings in judgments and decisions and activates a more affective mode of thinking. Specifically, I posit that consumers are more
likely to use their feelings to make judgments and decisions when the time perspective is closer to the present moment (e.g., when deciding to rent an apartment for next week) than when the time perspective is more distant (e.g., when deciding to rent an apartment several months into the future). In other words, the consumers' temporal perspectives influence the relative weight they place on the feeling-based versus reason-based systems in judgments and decisions.

The first part of my dissertation provides an overview of research on affect and time from related fields of marketing, social psychology, and economics. The following chapter reviews research on the role of affective feelings in judgment and decision making. Chapter 3 reviews affect as part of the dual system framework of judgment and decision making. In addition to reviews on affect, Chapter 4 examines the other vital factor of this dissertation—the influence of time on judgments and decisions. Chapter 5 integrates the two streams of literature on affect and time and discusses research on consumers' recall and prediction of affective experiences over time. Following these four chapters on literature review, Chapter 6 introduces the main thesis of this dissertation and then presents specific hypotheses formulated.

The effect of time perspectives on consumers' reliance on the feeling-based vs. reason-based system in valuation was tested in a series of nine experiments across various marketing contexts, including apartment choices (experiments 1, 2, 3, and 4), evaluations of video games (experiment 5), evaluations of past vacations (experiment 6), charitable donations (experiments 7 and 8), and willingness to pay for music CDs (experiment 9).
employed both direct and indirect methods to assess the use of feelings in consumer judgment and decision making. In the first two experiments, I demonstrate with different manipulations of time perspectives that, given a choice between two apartments—one that is superior on the affective dimensions (e.g., breathtaking views, lots of light) and one that is superior on the cognitive dimensions (e.g., bigger rooms, cheaper rent)—participants deciding for the immediate future tend to choose the apartment that is superior on the affective characteristics, whereas participants deciding for the distant future tend to choose the apartment that is superior on the cognitive characteristics. Both imagined and actual time perspectives were used to prompt near-future vs. distant-future orientations in these two experiments.

In experiment 1 (chapter 7), participants were asked to project themselves into a hypothetical situation imagining that they are graduating either next month (near future) or next year (distant future) before being given the choice of apartment task. In experiment 2 (chapter 8), students graduating either this year (near future) or next year (distant future) were reminded of and asked to think about their anticipated time of graduation before being given a similar task regarding apartment choice. The next experiment (experiment 3; chapter 9) then complemented experiments 1 and 2 by showing directly the judgmental processes underlying time perspectives in judgment and decision making. To further demonstrate that it is the weighting of affective information per se, I show in another experiment (experiment 4; chapter 10) that participants' incidental moods (positive vs. negative) were more likely to influence their decisions to rent a particular apartment when these decisions are imminent than when the same
decisions are remote. These four experiments summarized in chapters 7 to 10 provided converging evidence on the effect of future time perspectives on the reliance on feelings. In chapters 11 and 12, I start to examine in experiments 5 and 6 the effect of past-time orientations on the reliance on incidental feelings in evaluations of various video games and past vacations. Experiments 1-6 collectively suggested that consumers are more likely to use their feelings as inputs when deciding about present events as opposed to distant events, whether past or future.

Recent research has documented that the feeling-based system in valuation tends to be relatively scope-insensitive. That is, when consumers rely on feelings in assessing value, they tend to not take into account quantitative information such as magnitude or scope of the product (e.g., the number of CDs in a bundle) in their subjective valuation of this product (Hsee and Rottenstreich 2004). In the next three studies, I inferred the use of feelings vs. reasons in consumers’ judgments and decisions through the scope-insensitivity bias. This illustrates another consequence of the engagement of the affective system in the present. Experiment 7 (chapter 13) examined consumer decision making in the context of a donation to save one or more pandas from a construction project that would destroy their natural habitat. Participants donated about the same amount of money to save one panda or four pandas from a construction scheduled in the near future (i.e., next month). In contrast, they were willing to donate significantly more money to save four pandas than one panda from a construction scheduled in the distant future (i.e., two years later). However, when affective information was removed from the decision
context, experiment 8 (chapter 14) showed that participants across the time perspectives were willing to donate more money to save four pandas than to save one panda.

Experiments 7 and 8 contrast the influence of feelings on valuation decisions through the scope-insensitivity bias for the present vs. for the future. The ninth study (experiment 9; chapter 15) demonstrated that respondents were more likely to exhibit scope insensitivity (i.e., to use the feelings-based system) in their valuation for *The Beatles* CDs when prompted to think about the recent past than about the distant past. Importantly, these nine studies together (a) hold the affective experiences constant, (b) use various sources of affective feelings, (c) apply different manipulations of time perspectives, and (d) use various decision contexts beyond the delay of gratification and self-control domains.

These findings suggest that—given two systems available for decision making—consumers seem to shift the relative weights they place on their affective vs. cognitive systems in assessing value in judgments and decisions, using their feelings selectively depending on the temporal perspective. My final chapter discusses conclusions and implications of these findings on existing theory and marketing research, as well as implications for managers; I also offer suggestions for future research. For instance, one of the marketing implications from these findings is that marketers can design different product appeals—with an affect-focus or a reason-focus—depending on the anticipated timing of consumers’ decisions to buy the particular product (for instance, certain purchase decisions are usually planned in advance).
To summarize, an overview of my dissertation is as follows. The first part of this dissertation provides an overview of literature related to my thesis. Specifically, in the first few chapters I review research in the areas of affect on judgments and decisions (chapter 2), affect as part of the dual system models framework (chapter 3), time and decisions (chapter 4), and consumers' recall and prediction of affective experiences across time (chapter 5). I then introduce a theory proposed in this dissertation and formulate hypotheses to test this theory (chapter 6). The second part of this dissertation discusses nine experiments (chapters 7-15) conducted to test my hypotheses on the engagement of the affective system in the present through demonstrations of greater reliance on feelings as inputs to decisions (chapters 7-12) and greater neglect for scope information (chapters 13-15) under present orientations. Lastly, I will recapitulate these studies, discuss their limitations, address direction for future research, and provide theoretical and marketing implications.
Chapter 2

Literature Review on Affect and Consumer Decision Making

2.1 Introduction

The theoretical propositions that I extend in this research are based on a variety of findings from different streams of research in marketing, psychology, economics, and neuroscience. Two major themes of research fundamental to my propositions are affect and time. In this chapter, I briefly examine the literature on affect, especially on how affective feelings influence consumer judgment and decision making.

In general, research in the area of affect and consumer behavior (which encompasses judgment and decision making) can be grouped into two broad categories: affect as antecedents of behavior and affect as consequences of behavior. The former line of research assesses affective influences on consumption experiences (i.e., affect as independent variable; e.g., Pham 1998), whereas the latter examines affective responses resulting from consumption experiences (i.e., affect as a dependent variable; e.g., Burke and Edell 1989). The work on affect as independent variable is more pertinent to this research, as my objective is to provide a theory that predicts when consumers are more likely to rely on or use their feelings in judgments and decision making. Hence, for the rest of this chapter, I will concentrate my current discussion on affect as antecedent of behavior.
2.2 Affect as Antecedent of Behavior: Affect as Input to Behavior

The influence of affect on judgment and decision making has been typically proposed to involve a sequence of events, starting with the perception of the emotional stimulus, passing through some underlying affective state, and then ending with behavior or response (Winkielman et al. 2007). But theories on how affect influences judgments and decisions usually differ in the components of emotions—cognitive, behavioral, physiological, or experiential—that are regarded as crucial for affective influence.

According to the dominant psychological accounts of affective influences outlined by Winkielman and colleagues (2007), there are two general categories of models that explain how affect influences judgments and decisions: the associative models and the inferential models. The first account, associative models, includes the semantic memory model and action model. The second account, inferential models, includes the affect-as-information model and affect-regulation model. In line with Winkielman and colleagues’ (2007) framework, these models of affective influences on judgments and decisions will be reviewed next.

2.2.1 Associative Models: Cognitive and Behavioral Components of Feelings in Influencing Behavior

A category of models that explain how affect influences judgments and decisions is the associative models. These models describe affective influence as resulting from spreading activation in either a memory network (semantic memory models) or a motor network (action models; Winkielman et al. 2007). Association models generally assume that affective influence on behavior operates through fairly automatic, context-free
activation processes. However, models in this category differ in the components they identify as present and causally responsible for how affect influences subsequent behavior, primarily indicating either the cognitive component (i.e., changes in perceptual, attentional, and semantic aspects) or the behavioral component (i.e., activated motor programs and action tendencies) of feelings.

2.2.1.1 Semantic Memory Model: Cognitive Component of Feelings in Influencing Behavior

Semantic memory models propose that affective states are associatively linked to cognitive categories within a network of semantic memory. These models emphasize the cognitive component of feelings in affective influence, relating the influence of feelings to the thoughts that accompany these feelings (Schwarz and Clore 2007). For instance, Bower (1981) conceptualized emotions as nodes in an associative network, which are connected to ideas, events, and concepts of the same valence. When an emotion node is activated, the activation spreads and leads to activation of connected nodes.

Isen, Shalker, Clark, and Karp (1978) extended the affective influence on memory to the domain of judgments and decision making. They proposed a “cognitive loop” model, in which mood states lead to higher accessibility of mood-congruent information stored in memory and then color perceptions of the target. Hence, affect would influence judgments and decisions in a congruent manner through the affect-priming mechanism, whereby positive feelings would lead to more positive judgments, and negative feelings would lead to more negative judgments.
Consistent with this framework, similar mood-congruency effects have been observed in the consumer behavior domain. For instance, in one study, Isen and colleagues (1978) showed that shoppers given a small gift (presumably they were in a positive mood) were more willing to participate in a survey, evaluated products they owned more favorably, and recalled more positive materials in memory about these products than those not given a small gift. In a different context, Goldberg and Gorn (1987) examined advertisements embedded in happy or sad TV programs. They found that advertisements viewed in happy TV programs led to more affectively positive cognitive responses toward the ads and a greater perception of ad effectiveness. Edell and Burke (1987) found that feelings generated by ads could mediate attitude toward the ad and beliefs about attributes of the brands, consequently affecting ratings of overall ad effectiveness in a mood-congruent fashion. In judgments of perceived risks, Johnson and Tversky (1983) found that people who read sad newspaper articles tend to make more pessimistic estimates of risks, whereas people who read about a series of fortunate events tend to decrease their risk estimates. Numerous other studies have supported the cognitive, mood-congruent account of affective influence in a variety of contexts (e.g., Batra and Stayman 1990; Barone 2005; Srull 1983).

2.2.1.2 Action Model: Behavioral Component of Feelings in Influencing Behavior

In addition to semantic memory models, another type of associative models is action models. These models postulate that affective states are associatively linked to motor-action networks, emphasizing the behavioral component of feelings in affective influence.

1 Note that their results are not entirely consistent with this cognitive, memory-based account, because they found that risks unrelated to the newspaper article are also rated as more probable.
Research in this stream (sometimes known as the “embodied cognition approach”) typically argue that performing actions associated with either a positive or negative valence can directly lead to subjective experiences and subsequent judgments in a valence-compatible manner. For instance, Solarz (1960) suggested that, when exposed to positive stimulus, people respond faster with approach movement; but for a negative stimulus, people respond faster with avoidance movement. Dijksterhuis and Bargh (2001) argued that there may be automatic connections between perceptions and motor movements. Zajonc and Markus (1984) also argued that the impact of the somatic, behavioral component of feelings on judgments may be hard-wired, rather than experientially mediated (Leventhal 1982). In sum, these action models explore the impact of stimulus valence on motor behavior: positive valence would lead to motor actions that bring the stimulus closer to the self, whereas negative valence would lead to motor actions that push the stimulus away from the self (see Markman and Brendl 2005).

This stream of research has also garnered numerous empirical supports, using different behavioral tendencies. Strack, Martin, and Stepper (1988) asked participants to hold a pen either in their teeth (which simulated a smile) or in their lips (which simulated a frown) while evaluating a number of cartoons. Participants whose facial expression simulated a smile rated the cartoons as funnier, and participants whose facial expression simulated a frown rated the cartoons as less funny, than did participants in a control condition. Chen and Bargh (1999) demonstrated a compatibility effect in which participants pulled a lever toward the self faster upon the onset of positive words than for negative words, but they pushed a lever away from the self faster upon the onset of
negative words than for positive words. Extending this finding, Markman and Brendl (2005) found that this compatibility effect depends on participants’ spatial representation of their selves rather than their physical bodies. More specifically, participants moved the positive words toward their names (i.e., representing the selves) faster than when negative words were given, irrespective of whether the actions required pushing the word away or pulling it towards their physical body.

In the consumer behavior area, Förster (2004) examined the effect of approach and avoidance expressions on consumers’ evaluations of valenced products. In one study, participants were unobtrusively induced to either shake their head or nod their head by looking at valenced products that were moving horizontally or vertically on a computer screen. Förster (2004) found that head-nodding participants evaluated positively-valenced products more favorably, and head-shaking participants evaluated negatively-valenced products more unfavorably (i.e., when approach-avoidance expressions matched the valence of products), than participants whose expressions of approach or avoidance mismatched the valence of the products. In summary, these studies demonstrated associations between affective states and various behavioral tendencies, focusing on the behavioral component of feelings in affective influence.

2.2.2 Inferential Models: Experiential Component of Feelings in Influencing Behavior

Another category of models that attempt to explain how affect influences judgments and decisions is composed of what are termed “inferential models.” These models postulate
that affective influences stem from the inferences drawn from an affective experience, and emphasize the experiential component of feelings (i.e., subjective feeling or phenomenal experiences). Associative and inferential models present different perspectives on how mood-congruent judgments arise: for instance, the former postulates that different moods bring different associations to mind (e.g., Bower 1981), whereas the latter assumes that consumers misread incidental moods as their ostensible affective reaction towards the target stimulus (e.g., Schwarz and Clore 1983). Hence, while the associative models generally suggest a simplistic connection between affect and behavior, inferential models permit a more strategic and flexible use of feelings in steering judgments and decisions. These models allow predictions to go beyond simple main effects of affective influences on behaviors, predicting an interaction effect between affective states and perception of their likely causes (Schwarz and Clore 2007). For instance, in a classic study Schwarz and Clore (1983) found that the effects of happy and sad moods on ratings of life satisfaction were eliminated when participants were reminded of possible sources of their current feelings, and hence (mis)attributed their feelings to the transient sources. This finding cannot be explained by either semantic memory or action models, which predict that moods affect evaluations through selective recall of information from memory (i.e., semantic memory model) or by motor-action link (i.e., action model). In other words, inferential models suggest circumstances in which the presence of feelings may not influence behavior. Additionally, these models allow and provide explanations for the occurrence of mood-incongruent judgments. Two types of inferential models are reviewed below: affect-as-information model and affect regulation model.
2.2.2.1 Affect-as-Information Models

Affect-as-information models propose that consumers use their momentary feelings as actual sources of information. These models typically assume that consumers form judgments or decisions by asking themselves "How do I feel about it?" and then using their feelings at the time as a reflection of their judgments: thus feeling pleasant is interpreted as evidence of liking, and feeling unpleasant is interpreted as evidence of disliking (Pham 2004). However, sometimes consumers may confuse sources of their feelings arising incidentally from irrelevant sources as their reactions to the targets of evaluation. This suggests that, when reminded of the actual sources of feelings—that is, when the informational value of their feelings is called into question—consumers may correct for the influence of their experienced feelings in the process of making judgments and decisions. For instance, as mentioned earlier, Schwarz and Clore (1983) demonstrated that respondents reported higher life satisfaction judgments when good weather prevailed at the moment rather than bad weather, but this mood-congruent effect on evaluations is eliminated when they are reminded of the weather conditions.

In the consumer behavior domain, Gorn, Goldberg, and Basu (1993) showed that participants evaluated electronic stereo speakers more positively when pleasant music was played through these speakers than when unpleasant music was played. Moreover, this mood-congruent effect occurred only when participants were not aware of the source of their moods (i.e., when they rated the music after they had already evaluated the speakers) than when they were made aware of the source (i.e., when they rated the music before they evaluated the speakers). Presumably, when participants were made aware of
possible sources of their experienced mood states, they discounted the informative value of their feelings in evaluating the speakers.

In evaluating advertisements, Gorn, Pham, and Sin (2001) further showed that mood-congruent judgments were more pronounced when the affective-tone of the target (in this case, the ad) was ambiguous. One explanation underlying this observed effect is that mood state may have higher informational value in judgments when the target is affectively ambiguous; when the target is affectively unambiguous, a preexisting mood state has less information value since other, more diagnostic cues (for example, the target’s affective tone) are available (Gorn et al. 2001a). This finding corresponds with Isen and Shalker’s (1982) study in which they asked participants to rate the favorableness of photographic slides, and found stronger mood effects on evaluations of neutral slides than pleasant or unpleasant slides. These studies have found that consumers are more likely to rely on their feelings when other pieces of information are either ambiguous or not available, rendering feelings the most informative source (Gorn et al. 2001a; Isen and Shalker 1982).

Note that feelings may provide additional information than the basic goodness or badness (i.e., valence) of the target in which “how-do-I-feel-about-it?” conveys. Another model belonging to the affect-as-information category is the mood-as-input model (Martin, Ward, Achee, and Wyer 1993; Martin, Abend, Sedikides, and Green 1997), according to which consumers may change the evaluative and motivational implications of their moods, depending on how these moods are interpreted in the broader situational context.
Moods can serve as input into a configural, context-dependent processing system, just like other types of information. In some situations, rather than asking \textquotedblleft How-do-I-feel-about-it?\textquotedblright, consumers ask themselves \textquotedblleft How would I feel if...?\textquotedblright or \textquotedblleft What does it mean that I am feeling this way in this context?\textquotedblright (Martin et al. 1997; Martin 2001). For instance, consumers who experience positive feelings upon watching a funny movie and those who experience negative feelings during a sad movie may both evaluate the happy or sad film positively, because the nature or context of evaluation changed the criterion by which judgments are made. Specifically, mood may also serve as a role-fulfillment mechanism, providing information about whether the target of evaluation has fulfilled its expected role. In one study, Martin and collaborators (1997) showed that happy participants rated a happy story as more favorable than did sad participants, while sad participants rated a sad story as more favorable than did happy participants. Although the valence of their experienced moods differed, both happy and sad participants arrived at favorable evaluations depending on the target of evaluation: happy or sad stories were rated more positively when they fulfilled participants' expectations in eliciting happy or sad moods. In other words, unlike the other affect-as-information model which assumes that a positive mood conveys favorable evaluation and a negative mood conveys unfavorable evaluation, this mood-as-input model suggests that both negative and positive moods can convey either negative or positive implications after taking into account the context.

In a conceptually related study, Martin and collaborators (1993) asked participants to come up with a list of birds and varied the valence of their moods (positive vs. negative)
and the type of stop rule they adopted. They told participants to stop listing under one of the following conditions: whenever (a) they thought it's a good time to stop, (b) they no longer enjoyed the task, or (c) they felt like stopping. Results showed that, when they were told to stop listing as their enjoyment of the task ended, positive-mood participants persisted longer in the task than did negative-mood participants. However, the pattern reversed when participants were told either of the other two stop rules (i.e., stop when they thought it's a good time to stop or when they felt like stopping). Presumably, mood provided different information in these studies—depending on the context of evaluation—and thus in some situations led to seemingly mood-incongruent judgments.

According to Schwarz and Clore's (1983) affect-as-information model, mood-incongruent judgments can also arise when consumers were made aware of the actual sources of their feelings but overcorrected for affective influences. This is sometimes known as the "representativeness principle" of feelings" (Pham 1998).

In addition to the perceived informational value (or representativeness) of feelings, the use of feelings as a source of information may seem more relevant to certain types of judgments than others (Pham 1998; see also Adaval 2001, Yeung and Wyer 2004). For instance, empirical evidence has found that consumers are more likely to rely on their feelings when the judgment is affective in nature (i.e., when feelings are relevant). Pham (1998) found that participants were more likely to incorporate their feelings into evaluations for experiential, consummatory goals than for instrumental goals. Likewise, Adaval (2001) demonstrated that participants weighted mood-consistent product information more heavily in their evaluations than they did mood-inconsistent
information, especially when basing their product evaluations on hedonic criteria (e.g.,
jeans, running shoes). This study’s results confirmed the proposed affect-confirmation
model. Yeung and Wyer (2004) further showed that participants were likely to
incorporate their moods into their judgments for hedonic criteria when they did not have
a chance to appraise and form an initial impression of the product at the outset. In
addition to examining the relevancy of consumption goals or judgment criteria,
Ragunathan and Pham (1999) illustrated that participants were more likely to use their
feelings when judging their own preferences than someone else’s preferences, because
feelings seem more relevant to the former type of judgment. These studies collectively
showed that feelings are more likely to be used as a source of information when
consumers perceive these feelings as relevant for the evaluations at hand—this is
sometimes known as the relevance principle (Pham 1998). Treating feelings as a type of
information suggests that the use of feelings may resemble uses of other types of
information (see Feldman and Lynch 1988). In sum, affect-as-information models
suggest that consumers rely on their feelings (a) when the informational value of these
feelings is not called into question and (b) when these feelings seem relevant to the
judgment at hand.

2.2.2.2 Affect Regulation Model
Another type of inferential model is the affect regulation model, which suggests that
affective influence on judgments and decisions occurs because consumers attempt to
manage their feelings (Winkielman et al. 2007), whether to sustain positive feelings,
improve negative feelings, decrease positive feelings, or increase negative feelings.
Consistent with Gross's outline (1998), affective regulation is defined as involving processes whereby people influence their subjective, phenomenal experiences; it encompasses mood regulation (Larsen 2000; Martin 2000), defense (Bond et al. 1983; Bond and Vaillant 1986), coping (Lazarus 1991; Lazarus and Folkman 1984a; Lazarus and Folkman 1984b), and emotion regulation (Gross 1998).

Consumers manage their feelings for several reasons, including (1) to maintain or restore a desired emotional state, and (2) to meet the demands of the task or situation (Winkielman et al. 2007). First, consumers may seek or maintain positive affective states because they are inherently pleasant and rewarding (Clark and Isen 1982; Isen 1984), and consumers may avoid or repair negative affective states because they are inherently unpleasant (Zillmann 1988). Similarly, Larsen's (2000) control theory model of mood regulation suggests that consumers may inherently want to feel good, approaching things that make them feel pleasant and avoiding things that make them feel unpleasant. Such a hedonistic premise was also present in Tice, Bratslavsky, and Baumeister’s (2001) outline of self-regulation of emotions, which posits that mood repair becomes a top priority when consumers are in negative affective states. Several studies have documented that consumers experiencing negative feelings are more likely to make choices that would lead them to feeling more positive. Bryant and Zillmann (1984), for instance, found that people can overcome negative affective states such as boredom or stress by selectively exposing themselves to television programs that are expected to elicit positive feelings (e.g., exciting or relaxing television programs). Knobloch and Zillmann (2002) illustrated that participants improved their negative moods by choosing
to listen to highly energetic-joyful music for longer periods than did those in positive moods.

In the marketing domain, some studies suggested that consumers engage in self-pampering activities to improve their moods (e.g., Kacen 1994). For instance, Mick and DeMoss (1990) and Mick and Faure (1998) suggested that consumers may purchase self-gifts for reward or therapeutic reasons. These studies collectively illustrated that people are motivated to restore their negative feelings to desired, positive affective states. Not only do consumers seek to restore desired, positive affective states, they also seek to maintain these preexisting, positive states. Studies have documented that consumers are more sensitive to situational cues that may threaten their positive feelings. For instance, Kahn and Isen (1993) found that when a product's negative features were made salient, happy participants who otherwise showed a greater preference for product exploration halted their variety-seeking behavior. This idea is related to Wegener and Petty's (1994) hedonic contingency hypothesis, which postulates that positive moods encourage more careful scrutiny of the hedonic consequences of possible actions.

Second, in addition to the hedonistic assumption that consumers may seek to optimize their affective experience, they may deliberately maintain or change their existing moods to meet task or situational demands (Erber and Erber 2001). In their Social Constraint Model of Mood Regulation, Erber and Erber (2001) distinguished two motives that can influence consumers' attempts at regulating their moods: a maintenance motive and a control motive. When there are no constraints (e.g., task, situation, person), consumers
are assumed to carry the mood maintenance motive, yielding mood-congruent behavior. However, when there are constraints imposed by the task, situation, or person, consumers are assumed to have a mood control motive, leading to attempts to neutralize their existing affective states and yielding mood-incongruent behavior. Related to this nonhedonistic, context-dependent view posited by Erber and Erber's (2001) Social Constraint model, research has demonstrated that consumers may not only regulate their moods to obtain hedonic benefits but also do so to obtain utilitarian benefits under task or situational demands. When consumers are motivated to obtain utilitarian benefits, they may seek to experience any affect that leads to instrumental success. That is, consumers may be motivated to get into an emotional state that maximizes performance, even when this entails putting themselves into negative affective states (Tamir 2005). For instance, Tamir (2005) found that when driven by performance goals, participants were motivated to experience unpleasant affect when it is trait-consistent; those who were high in neuroticism were more likely to choose to increase their level of worry than those who were low on the same trait. Similarly, Tamir, Chiu, and Gross (2007) found that when anticipating a threatening task, participants who viewed negative emotions as useful for the task (e.g., worry and fear as useful for avoiding threats) were more likely to engage in activities that may increase these negative emotions before the task. Erber, Wegner, and Therriault (1996) demonstrated that participants deliberatively looked for mood-incongruent materials to neutralize their preexisting moods, in anticipation of social interaction with a stranger. However, participants exhibited no such mood-neutralization effects when they anticipated meeting others of their own mood.
In the marketing domain, Cohen and Andrade (2004) found that when consumers were expected to perform a task that required control over impulse purchases, participants experiencing positive moods as well as those experiencing negative moods chose to listen to mood-incongruent music to “neutralize” their mood before the task began. Collectively, these findings illustrated that utilitarian considerations may play a role in consumers’ affect regulation, possibly even leading consumers to prefer negative affective experiences to meet the demands of the task or the situation (Erber and Erber 2001). In summary, research on affect regulation models suggests that consumers may automatically or deliberatively influence their affective states to obtain both hedonic rewards and utilitarian benefits.

2.2.3 Integrating Associative and Inferential Models: the Affect-Infusion Model

The two general categories of models—associative and inferential—that explain how affect influences judgments and decisions are not necessarily inconsistent with each other. Instead, Forgas’ (1995) Affect-Infusion Model (AIM) suggests that these models operate under different processing conditions. Specifically, Forgas’ model depicts various conditions under which the semantic memory model (a type of associative model) and the affect-as-information model (a type of inferential model) may operate.

The AIM identifies four types of judgmental strategies with different potentials for affective influences, operating along a processing continuum: (a) direct access strategy, used when judging familiar targets in which previously formed evaluations are accessible in memory; (b) motivated processing strategy, used when consumers are motivated to reach a certain conclusion; (c) substantive processing strategy, used when consumers
have unconstrained processing capacity and high accuracy motivation to form judgments that are somewhat important in nature; and (d) heuristic processing strategy, used when consumers have constrained processing capacity and low accuracy motivation to form judgments that are not very important (Forgas 1995). According to AIM (Forgas 1995), affect exerts the greatest influence on judgments when consumers employ the latter two processing strategies: substantive processing strategy, whereby premises of the semantic memory model (e.g., Bower 1981; Isen et al. 1978) are assumed to dominate; and heuristic processing strategy, whereby affect-as-information models (e.g., Schwarz and Clore 1983) are assumed to take over. Thus, under a substantive processing strategy, consumers are assumed to engage in extensive memory search and elaboration, resulting in mood-congruent recalls, whereas under a heuristic processing strategy, consumers are assumed to draw upon their affective feelings as a source of information. In addition, although feelings are assumed to play a less central role in direct access strategy, they may influence the selection of this strategy in the first place (Forgas 1995). However, while this model is among the first efforts to integrate the different streams of research on affect and judgments, some empirical findings do not correspond to predictions of the model. By assuming that affect can serve only as a source of information under heuristic processing, this overlooks the influence of feelings generated from the target and advantages of rapid affective responses (e.g., Pham et al. 2001, Klein 1999).

2.3 Summary: Ways in which Feelings Enter Judgments

As reviewed above, various theories of affective influence have identified different components of emotions—whether cognitive, behavioral, or experiential—as responsible
for how affect enters judgments and decisions. Affect can enter consumers' judgments both directly (e.g., Pham 1998) and indirectly (e.g., Adaval 2001). From the above review of studies on affective influences on behavior, three possible mechanisms can be identified by which affect directly enters judgments and decisions (Pham 2004).

First, affect may enter judgments and evaluations directly through simple association. This mechanism occurs when the evaluative meaning of feelings (mostly their valence) is transferred to target stimuli that are presented simultaneously—the process is sometimes called “affect transfer” (e.g., Mackenzie and Lutz 1989). Second, feelings may enter evaluations and behaviors by the action tendencies (e.g., approach and avoidance) that these feelings are associated with. An example of this mechanism is found in the action model, which recognized the behavioral component of feelings in exerting influence on behavior. Third, affect may enter judgments and decisions through the inferences drawn from the affective experience. That is, feelings can serve as a source of information for evaluations and judgments when one asks “how do I feel about it?”: Pleasant feelings render favorable evaluations, whereas unpleasant feelings render unfavorable evaluations. An example of this mechanism is the affect-as-information model, which identified the experiential or “felt” component of feelings in its impact.

In addition to the three mechanisms postulating direct affective influences on judgments and decisions, a fourth mechanism proposes an indirect effect. Fishbein and Middlestadt (1995) maintained that affect enters judgments and decisions indirectly by changing people's perceptions and beliefs about the target object. They argued against a direct link
between noncognitive factors and evaluations. In short, this fourth mechanism posits that affective feelings may trigger certain perceptions and beliefs that are then integrated into judgments and behavior (Pham 2004). An example of the fourth mechanism is postulated by the semantic memory model, which highlights the cognitive component of affective influence.
Chapter 3
Affect as Part of a Dual System of Judgment and Decision Making

3.1 Introduction to Dual Systems

The influence of feelings on thinking and behavior has been a topic of interest for writers, philosophers, and psychologists for centuries. Many have viewed feelings as a potentially dangerous, invasive force that leads people astray from rational thinking and behavior. For instance, Freud’s psychodynamic theories suggested that feelings can overwhelm thinking and behaviors unless psychological resources (i.e., various ego mechanisms) are used to control these unwanted impulses (for a review see Deutsch and Krauss 1965, chapter 5; and Heidbreder 1933, chapter 10). In this regard, feelings have been viewed as impediments to rational judgments and decision making. However, in the past few decades an emerging view from various domains recognizes and argues for the important, beneficial effects of feelings on judgment and decision making. Not only are feelings vital to adaptive responses and the decision-making process, they seem to be a necessary component, as hypothesized (Damasio 1994). For instance, Frank (1988) argued for the beneficial, strategic role that feelings play in facilitating socially efficient interactions. Affective reactions are not necessarily irrational and harmful inputs that cloud decision making; in fact, they may exert predictable, advantageous, and consistent influences over people’s behavior (Pham et al. 2001). In this section, I will first review early and contemporary dual-system models, and then discuss the various unique properties of the affective system on judgments and decision making.
3.2 Early Dual System Model: Adam Smith on the "Theory of Moral Sentiments"

As mentioned by Ashraf, Camerer, and Loewenstein (2005), one of the earliest dual-process models was proposed almost two hundred and fifty years ago. In 1759, the famous economist Adam Smith proposed in his *Theory of Moral Sentiments* a dual-process framework encompassing the "passions" and the "impartial spectator." The passions—including emotions, motivational states, and physiological drives—was claimed to be the default system that drives behavior, but it can be moderated by the impassionate impartial spectator. While the eagerness of the passion would "seldom allow us to consider what we are doing" (PIII.I.90) and would bias, magnify, and misrepresent our views, this cool and impartial spectator was the "judge within the breast" who determines what is good, correct, and equitable in our actions. Much of behavior, as Smith argued throughout the book, was determined by a struggle between the passions and the impartial spectator:

> His own natural feeling of his own distress, his own natural view of his own situation, presses hard upon him, and he cannot, without a very great effort, fix his attention upon that of the impartial spectator. Both views present themselves to him at the same time. His sense of honour, his regard to his own dignity, directs him to fix his whole attention upon the one view. His natural, his untaught and undisciplined feelings, are continually calling it off to the other...The different views of both characters exist in his mind separate and distinct from one another, and each directing him to a behaviour different from that to which the other directs him. (Part III, Chapter 3b)

Among Smith's discussion of the various properties of the two processes, of particular interest to this thesis are the ones that relate to time. The passions, a system of emotions and physiological drives, is fundamentally myopic. As Smith describes, "The pleasure which we are to enjoy ten years hence, interests us so little in comparison with that which we may enjoy to-day, the passion which the first excites is naturally so weak in
comparison with that violent emotion which the second is apt to give occasion to, that the
one could never be any balance to the other, unless it was supported by the sense of
propriety.” In contrast to the heavy emphasis of the passions on the present, the impartial
spectator was much less confined to the heat and intensity of the moment with which
“our peculiar situation inspires us” (III.1.90). The spectator “does not feel the
solicitations of our present appetites. To him the pleasure which we are to enjoy a week
hence, or a year hence, is just as interesting as that which we are to enjoy this moment”
(as cited in Ashraf et al. 2005; p.3). This framework closely resembles many of the
contemporary dual-process models, which will be discussed next.

3.3 Contemporary Dual-System Models

In the past two decades, a flurry of dual-system models emerged: Kahneman and
Frederick’s dual-system model (2005; 2002), Epstein’s (1994) cognitive-experiential
reflective-impulsive model, Smith and DeCoster’s (2000) two-memory-systems model,
Stanovich and West’s (2000) dual-system model of individual differences, Evans’ (2006;
unconscious thought theory, Lieberman, Gaunt, Gilbert, and Trope’s (2002) reflexion-
and-reflection model, and the like. These models have different interests that cover an
array of domains, including judgment and decision making (e.g., Kahneman and
Frederick 2002), personality and individual differences (e.g., Epstein 1994), reasoning
and problem solving (e.g., Sloman 1996), and memory and learning (e.g., Smith and
DeCoster 2000). Although they have different focuses, these dual-system models usually
discuss two separate mental faculties or systems, each operating according to different principles that would then lead to evaluations and behaviors in various domains. Typical distinctions used to differentiate the systems include (a) automatic versus controlled processes (e.g., Strack and Deutsch 2004; Stanovich and West 2000) and (b) associative versus rule-based processes (e.g., Sloman 1996; Smith and DeCoster 2000). These two categorizations seem to correspond to each other, whereby associative processes were assumed to be automatic, and rule-based processes were assumed to be controlled (e.g., see Sloman 1996, Kahneman and Frederick 2002).

Although the details and specific properties of each of these dual-system models are not necessarily identical (see Stanovich and West 2000), they share many commonalities in the properties or criteria used to differentiate the two systems. Ensuing sections of this paper review the generic properties common in most of the dual-system models as well as important differences between them. Further, empirical generalizations characterizing the special properties of the affective system in judgments and decisions are discussed.

3.3.1 Commonalities between the Dual-System Models

Before I continue to discuss general characteristics of the two systems, I will first delineate the terminologies used in the current review. Different labels for the two systems have been used by different authors. As did Stanovich and West (2000) and Kahneman and Frederick (2002; 2005), I will adhere to the most neutral terms used in the dual-systems literature—namely, System 1 and System 2 processes. I limit my review to
the literature on the more recent dual-system models with a focus on the underlying process, because these are more relevant to the current thesis.

Following from Kruglanski and Orehek's (2007) between classes of dual-process models, the present review concerns frameworks that (a) highlight qualitatively different judgmental processes in which evaluations can be reached and (b) downplay the role of different informational types or contents emphasized in the Elaboration Likelihood model and Heuristic-Systematic model. In other words, this outline excludes other, earlier dual-process theories such as the Elaboration Likelihood model (ELM; Petty and Cacioppo 1981) and the Heuristic-Systematic model (HSM; Chaiken 1980) that place special emphasis on types of information; these earlier models typically outline two modes that are applicable to different information types, such as message arguments and situational cues of the message, and are more specific to particular persuasion domains (Kruglanski and Orehek 2007). In addition, models that propose different processes lying on two ends of a continuum, rather than discrete processes or systems, are not discussed here. For instance, Hammond (1996) proposed a cognitive continuum, anchored by analysis and intuition, in which properties of the information environment would induce a matching mode of cognitive activity along this continuum. Hence, the dual-system models reviewed here include: Epstein's (1994) cognitive-experiential self-theory, Sloman's (1996) two systems of reasoning, Kahneman and Frederick's dual-system model (2002; 2005), Strack and Deutsch's (2004) reflective-impulsive model, Smith and DeCoste's (2000) two-memory-systems model, Stanovich and West's (2000) dual-system model of individual differences, Evans' (1984; 2006) heuristic-analytic theory of

In terms of its evolutionary properties, System 1 is assumed by most models to be primitive, with its older set of autonomous subsystems (Evans 2006). It is a universal system shared by humans and animals (Epstein 1994; Lieberman et al. 2002) and is acquired by biology or genes, repeated exposure to the environment, and personal experiences (Stanovich and West 2000; Epstein 1994). Thus, some models assume that the learning of system 1 is slow because it takes repeated trials or exposures to learn general regularities (Smith and DeCoster 2000). In contrast, system 2 is assumed to be a more recent development (Evans 2006). It is uniquely human and is acquired by culture and social learning (Epstein 1994). The learning of system 2 is rapid because representation of novel events can be picked up quickly—sometimes as quickly as after a mere one-time occurrence (Smith and DeCoster 2000).

In terms of its processing characteristics, system 1 is generally assumed by most dual-system models to be automatic, unconscious (preconscious), and quick (Epstein 1994; Dijksterhuis and Nordgren 2006; Lieberman et al. 2002). The processes governed by system 1 occur automatically, and only the product of its processes is posted in consciousness (Evans 2003). Hence, some theorists have claimed that the outcome of system 1 is experienced passively (Epstein 1994; Strack and Deutsch). It takes less effort and is less demanding of cognitive capacity (Dijksterhuis and Nordgren 2006), and thus most models assumed system 1 to be the default system (Epstein 1994; Kahneman and
Frederick 2002). In contrast, system 2 is generally assumed to be controlled, conscious, and slow in speed of operation (Epstein 1994; Dijksterhuis and Nordgren 2006; Lieberman et al. 2002). System 2 processes occur in a controlled manner, whereby its onset depends on cognitive capacity, motivation (Smith and DeCoster 2000), intention, and arousal (Strack and Deutsch 2004); thus, all of its processes operate in consciousness (Dijksterhuis and Nordgren 2006). Its operation demands more effort and cognitive capacity. Most of the models also posited that the two systems operate in parallel and interactively (e.g., Epstein 1994, Sloman 1996, Kahneman and Frederick 2002, Smith and DeCoster 2000, Strack and Deutsch 2004).

Furthermore, the two systems tend to lead to different types of information representation, with system 1 being associative and system 2 rule-based. System 1 is structured by images, similarities, and contiguities, processing in parallel and distributive form. In contrast, system 2 is structured by logic, symbols, and languages, processing serially or sequentially. The two systems are also assumed to differ in task construals. System 1 tends to be contextualized—processing information in a context-specific manner in which concepts are represented in a set of features, based on past exposure—and system 2 tends to be decontextualized. The latter system thus allows people to engage in abstract, hypothetical thinking, constructing mental simulations of future possibilities (Evans 2006). Some models additionally posit that only system 2 is able to generate time perspective (Strack and Deutsch 2004). Although some dual-system models did not explicitly link affect to either system, the models that did include the role of affect all seem to relate it to the associative, experiential system (system 1). For instance, an
important assumption in one of the proposed dual-system models is that “the experiential system is emotionally driven” (Epstein 2004, p. 715). The common properties of most dual-system models are outlined below:

Table 3.1. Common properties of the two systems in the Dual-System Model framework.

<table>
<thead>
<tr>
<th><strong>System 1</strong></th>
<th><strong>System 2</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Evolution</strong></td>
<td><strong>Recent</strong></td>
</tr>
<tr>
<td>Primitive; older set of autonomous sub-systems</td>
<td>Universally human</td>
</tr>
<tr>
<td>Universal; shared with animals</td>
<td>Acquisition by cultural and explicit learning (culturally shared or socially learned rules)</td>
</tr>
<tr>
<td>Acquisition by biology, repeated exposure, and personal experience</td>
<td>Fast-learning</td>
</tr>
<tr>
<td>Slow-learning</td>
<td><strong>Process characteristics</strong></td>
</tr>
<tr>
<td>Unconscious (preconscious)</td>
<td>Conscious</td>
</tr>
<tr>
<td>Automatic</td>
<td>Controlled</td>
</tr>
<tr>
<td>Rapid speed of operation</td>
<td>Slow speed of operation</td>
</tr>
<tr>
<td>Not capacity-constrained</td>
<td>Capacity-constrained</td>
</tr>
<tr>
<td>Effortless</td>
<td>Effortful</td>
</tr>
<tr>
<td>Associative</td>
<td>Rule-based; deductive; logical</td>
</tr>
<tr>
<td>Parallel</td>
<td>Serial; sequential</td>
</tr>
<tr>
<td>Structured by percepts, images, similarity, and contiguity</td>
<td>Structured by symbols and language</td>
</tr>
<tr>
<td>Contextualized</td>
<td>De-contextualized (allows abstract, hypothetical thinking)</td>
</tr>
<tr>
<td>Affective; feeling-based (Affect-rich)</td>
<td>Logical; reason-based (Affect-poor)</td>
</tr>
</tbody>
</table>

3.3.2 Differences between the Dual-System Models

While the dual-system models seem to make many of the same assumptions about properties of the two processes, or at least there are clear family resemblances, important differences exist among them in some of the details, architectural assumptions, and technical properties they make. For instance, a subset of the models explicitly incorporates affect or feelings into the model, whether as a process characteristic of a
system (e.g., Epstein 1994, Strack and Deutsch 2004), as products resulting from either system's operations (e.g., Strack and Deutsch 2004, Smith and DeCoster 2000), or as the content on which the system acts (e.g., Kahneman and Frederick 2002). Epstein (1994) identified affect as a process characteristic of system 1 and assumed that the experiential system (i.e., system 1) is "intimately associated with the experience of affect" (p. 716). Similarly, Strack and Deutsch (2004) stated that "...the impulsive system can be understood as a system of experiential primacy, in which affective and nonaffective feelings are generated quickly...." (p. 224). They also acknowledged that "Affect and emotion are understood as products of the reflective and the impulsive system" (p. 237, Strack and Deutsch 2004). Although Kahneman and Frederick (2002) discussed affect in their model, they viewed it as the content on which system 1 acts rather than as a process characteristic. Some dual-system models (e.g., Smith and DeCoster 2000) also noted the effects of mood on the reliance of either processing system, whereby positive mood leads to use of the associative system (or system 1) and negative mood leads to use of the rule-based system (system 2).

Some of these models emphasize the important role of affect in instigating cognitive and behavioral activities (e.g., Strack and Deutsch 2004), and although some models do not explicitly incorporate affect, they implicitly suggest that affective process is more related to system 1 by the neurological regions identified (Lieberman et al. 2002). Lieberman and colleagues (2002) proposed that system 1 (what they called the \(X\) system) includes the lateral temporal cortex, amygdala, and basal ganglia, which are often identified as the regions involved in automatic processes and associated with affect. System 2 (what they
called the *C system*), on the other hand, includes the anterior cingulate, prefrontal cortex, and hippocampus, which are often identified as the regions involved in controlled processes and affect-free (Lieberman et al. 2002). In contrast, other models are completely silent on the topic of affect (e.g., Sloman 1996, Dijksterhuis and Nordgren 2006).

There are also differences in the architectural assumptions made by these models. Most of the models reviewed here assume that system 1 and system 2 occur simultaneously and can be active concurrently (e.g., Sloman 1996, Epstein 1994, Kahneman and Frederick 2002, Strack and Deutsch 2004, Lieberman et al. 2002). Some of these models additionally assume an asymmetry in processing of the two systems. For instance, Strack and Deutsch (2004) stated that the two systems operate in parallel, but with “an asymmetry such that the impulsive system is always engaged in processing (by itself or parallel to operations of the reflective system) whereas the reflective system may be disengaged” (p. 223). In contrast to assuming a parallel nature of processing, a few of the models proposed that they occur sequentially, with system 1 occurring before system 2 (e.g., Evans 1984, 2006). This was the case in Evans’ (2006) heuristic-analytic theory of reasoning, in which the two systems were presented as a two-stage sequential model—with heuristic processes comprising the first stage and analytic processes comprising the second stage.

Importantly, dual-system models differ in their conjectures about the effects of the two systems on judgments and decision making. These models fall into three classes in terms
of the general effects of the two processes in leading to better, more accurate evaluations and behaviors: (a) models that treat the two systems as equally capable of leading to optimal responses (Epstein 1994; Sloman 1996; Smith and DeCoster 2000); (b) models that imply system 2 as the superior one (Kahneman and Frederick 2002, 2005; Evans 1984, 2006); and (c) models that suggest system 1 as the superior one (Dijksterhuis and Nordgren 2006). These differences are reviewed next.

3.3.2.1 Models that Treat the Two Systems Equally

Models in this class—such as Epstein’s (1994) cognitive-experiential self theory, Sloman’s (1996) two systems of reasoning, and Smith and DeCoster’s (2000) two-memory-systems model—either simply describe the functional differences in two-system processes, without placing emphasis on optimality of process outcomes, or suggest that both systems are necessary for successful task completion, depending on the requirement and type of task. For instance, Sloman (1996) argued that both systems of thoughts are necessary because they serve different but complementary functions: “The associative system is able to draw on statistical structure, whereas a system that specializes in analysis and abstraction is able to focus on relevant features...associative paths that are followed without prejudice can be a source of creativity, whereas more careful and deliberative analyses can provide a logical filter guiding thought to productive ends...probably all disciplines demand this combination of creativity and rigorous rule application” (p. 18). Similarly, Epstein (1994) assumes that the experiential system and the rational system have different processing characteristics, and depending on the situation or problem, either system can be “smarter” than the other. Smith and DeCoster
(2000) further suggested that either system can lead to more accurate conclusions, depending on the underlying motives spurring either the associative or rule-based system. One of the motives they outlined was the processing effect of motivation to defend a particular view, which may drive rule-based processing (Smith and DeCoster 2000). They indicated that “rule-based processing...may not be evenhanded and unbiased and may, in fact, decrease (rather than increase) the accuracy of overall conclusions compared to the results of associative processing” (p. 117). In short, these models do not claim that either system is superior to the other or that a system is accountable for accurate conclusions, but they suggest that the systems are suited for different task requirements and that both can lead to desirable outcomes.

3.3.2.2 Models Implying a Superiority of System 2

A subset of these models—namely, Kahneman and Frederick’s (2002) dual-systems model, Evans’ (1984, 2006) heuristic-analytic theory of reasoning, and Lieberman et al.’s (2002) reflexion-and-reflection model—assumes that system 2 monitors the responses given by system 1 before they influence overt behavior. This class of models typically assumes that the rapid, largely unconscious processes of system 1 supply content or basis for the slow, conscious process of system 2, cueing default responses which system 2 may approve or intervene upon with more effortful reasoning (e.g., Evans 2006). In other words, these models seem to assume that one system supplies a default response which the other system anchors on before it influences overt behavior, although some (e.g., Kahneman and Frederick 2002, 2005) still claim that their models suppose the two systems operate concurrently and compete for the influence of overt responses. Notice
that these assumptions closely correspond to Adam Smith’s descriptions of the two systems—the passions and the impartial spectators—in *The Theory of Moral Sentiments* (1759). In the domain of judgment and decision making, the supervisory role of system 2 on responses made by system 1 was explicitly stated in Kahneman and Frederick’s (2005) dual-system model: “Our model assumes that an intuitive judgment is expressed overtly only if it is endorsed by system 2” (p. 272). Their model further supposes that one of the tasks for system 2 is to overcome or correct for biases in intuitive judgment—that is, errors caused by system 1. It is only when both systems fail that people arrive at erroneous, biased, or suboptimal judgments and decisions. Evans (2006) similarly proposed that “Biases were accounted for...that logically relevant information might be omitted or logically irrelevant information included at the heuristic state. Since analytic reasoning could be applied only to these heuristically formed representations, biases could result” (p. 378), which essentially puts the blame for any biases in reasoning on system 1. In a similar vein, Lieberman and colleagues (2002) claimed that “when problems arise in X-system, the C-system attempts a remedy” (p. 204). They also described three functions of system 2 (or what they call the reflective system, the C-system) as “identifying when problems arise in X-system, taking control away from X-system, and remembering situations in which such control was previously required” (p. 228). Their model, corresponding to Kahneman and Frederick’s (2002) model, suggests a somewhat dominant, monitoring role of system 2 in judgments and decisions. This diverges from the class of models reviewed earlier. For instance, although Epstein (1994) also suggested that system 1 is likely to be the default system, he contended that “because the influence is usually outside of awareness, the rational system fails to control it
because the person does not know there is anything to control” (p. 716), thus allowing for unconscious influence. In sum, a subset of dual-system models—such as those proposed by Kahneman and Frederick (2002), Evans (2006), and Lieberman et al. (2002)—suggests that system 2 is superior to system 1, leading to better responses than those cued by system 1.

### 3.3.2.3 Models Suggesting a Superiority of System 1

There is yet another class of models that make exactly the opposite claim to those models suggesting the superiority of system 2 in leading to optimal outcomes. Models belonging to this third class argue that system 1, as opposed to system 2, is the superior system. An example of such a model is Dijksterhuis and Nordgren’s (2006) Unconscious Thought Theory. The theory distinguishes between two modes of thoughts, unconscious and conscious, differing according to six principles—unconscious-thought, capacity, bottom-up-versus-top-down, weighting, rule, and convergence-versus-divergence principles.

Like most of the other dual-system models (e.g., Strack and Deutsch 2004, Smith and DeCoste 2000, Kahneman and Frederick 2002), Dijksterhuis and Nordgren’s model assumes that the unconscious system (i.e., system 1) is not constrained by cognitive capacity as it is in the conscious system (i.e., system 2; the capacity principle). Some of the other models thus assume that processes of system 2 are disrupted more easily than those of system 1 (e.g., Strack and Deutsch 2004). However, Dijksterhuis and Nordgren’s model makes a further claim that “the unconscious naturally weights the relative importance of various attributes. Conscious thought often leads to suboptimal weighting because it disturbs this natural process” (Dijksterhuis and Nordgren 2006, p.
Because unconscious thought is an active, goal-directed process, these authors contended that "as a result of unconscious thought, people's mental representation of a relevant object becomes more polarized and better organized. These changes help people to make better decisions" (Dijksterhuis and Nordgren 2006, p. 99; the bottom-up-versus-top-down principle). Based on these six principles, Dijksterhuis and Nordgren (2006) argued that unconscious thoughts are better suited for complex decisions than are conscious thoughts. Therefore, whereas Kahneman and Frederick's (2002; 2005) model assumes that suboptimal judgments are reached only when system 2 fails to correct for the intuitive judgments made by system 1, Dijksterhuis and Nordgren's (2006) model assumes that erroneous responses are made as a result of system 2's disruption of system 1's natural process.

3.4 Affect as a Decision System: Unique Properties of the Affective System in Judgments and Decisions

Some unique properties of the associative, affective system (system 1) in judgments and decision making, as compared to the rule-based, cognitive system (system 2), include: insensitivity to scope or magnitude of the target stimulus, increased speed and processing efficiency, more extreme and polarized judgments, myopia, and greater interpersonal and intrapersonal consistency in judgments (see Pham 2007; Pham 2004).

Judgments and decisions based on feelings tend to be sensitive to the presence or absence of affect-producing stimuli, but relatively insensitive to further variations in the magnitude of these stimuli (Hsee and Rottenstreich 2004; Kahneman et al. 1999). That is,
when consumers rely on feelings in assessing values, they tend to not take into account quantitative information such as magnitude or scope of the stimulus (e.g., the number of pandas to be saved in the context of charitable donations) in their subjective valuation of this product. In a very interesting study, Hsee and Rottenstreich (2004) asked participants how much money they would be willing to donate to save one vs. four pandas. When the pandas were represented in an abstract, affect-poor fashion, participants indicated a significantly higher amount of money that they were willing to donate to save four pandas than to save one panda; participants in these conditions were sensitive to the scope or number of pandas. However, when the pandas were represented in an affect-rich, pictorial format, participants indicated a comparable amount of money that they were willing to donate for saving one vs. four pandas; participants in the affect-rich conditions did not seem to take into account the number of pandas in their valuations.

Judgments and decisions based on feelings can be reached more rapidly than comparable ones based on descriptive inputs, depending on the type of affect experienced (Pham, Cohen, Pracejus, and Hughes 2001). Evaluations and decisions based on feelings require less processing or cognitive resources than ones based on descriptive inputs. Hence, in studies where processing resources are constrained by time pressure (Finucane et al. 2000; Siemer and Reisenzein 1998) or cognitive load (Shiv and Fedorikhin 1999), consumers seem to rely more on their feelings in judgments and decisions. For instance, participants were more likely to choose an affectively-superior chocolate cake over a cognitively-superior fruit salad when their processing resources were limited by increased cognitive load (Shiv and Fedorikhin 1999).
Judgments and decisions based on feelings can be more extreme and polarized than comparable ones based on descriptive inputs. This may be due to the following: (1) feelings toward everyday stimuli tend to be more extreme than reason-based assessments of the same stimuli; (2) feelings trigger a confirmatory search pattern (Pham et al. 2001; Yeung and Wyer 2004), which increases polarization; and (3) feelings have strong drive properties (Pham 2007). For instance, Sinaceur, Heath, and Cole (2005) found more dramatic decreases in beef consumption when newspapers in France used the affect-rich label “Mad Cow disease” as opposed to the affect-poor, scientific label “Creutzfeldt-Jakob disease.”

Judgments and decisions based on feelings seem to be more myopic in that consumers weigh immediate hedonic rewards more heavily than delayed ones (even when the delayed rewards are more valuable overall). Loewenstein (1996) explains the myopia of feeling-based judgments via the accessibility of immediate and delayed affective reactions. Consumers feel strongly for a steak or chocolate cake that is available immediately but do not have the same feeling intensity for the same items that are available in three months. I will return to this point in the next chapter.

Judgments and decisions based on integral feelings can lead to greater consistency in evaluations, both interpersonally (Pham et al. 2001) and intrapersonally (Lee, Ariely, Amir 2007). Pham and colleagues (2001) found that participants were more consensual regarding their feelings toward stimuli such as magazine pictures and television commercials than regarding their reason-based assessments of these stimuli. Similarly,
Lee and colleagues (2007) found that participants were more transitive in their choices between pairs of products when they relied on their feelings. These results go counter to the common belief that feelings are highly subjective and unreliable.
Chapter 4

Literature Review on Time and Decisions

4.1 Introduction

The study of time and its effects has been a topic of great interest across various disciplines, most notably economics and psychology. These two disciplines approach the study of time differently, whereby (relatively speaking) economics is more analytically driven and psychology more data-driven. Hence, the focus that the two disciplines undertake on the same topic is quite distinct. Despite the different approaches undertaken on time-related investigations, a common theme among them concerns how the value of outcomes changes as a function of time, with time being either objective/physical time or a subjective/psychological time perspective.

One major area concerning time and decisions is intertemporal choice, the study of value that people place on decisions with different costs and benefits spread over time. Economists generally approach the problem of intertemporal choice by means of building a model in which people discount the value of future outcomes at a constant rate (Samuelson 1937). Most of the research efforts in economics revolve around formalizing and testing the validity of Samuelson’s (1937) discounted utility (DU) model. According to the DU model, people have a single, simplified rate of time preference that they use to discount the utility or value of future events (Frederick et al. 2002). Psychologists, in contrast, have focused on measuring individual differences in the tendency to delay gratification (Mischel et al. 1989), identifying situational determinants of impulsivity, or
distinguishing the cognitive and emotional mechanisms underlying intertemporal choice (Trope and Liberman 2000).

The rest of this chapter discusses a major theme in time and decisions—intertemporal choice. It is organized as follows: First, definitions of intertemporal choice and some underlying mechanisms are considered. Second, the standard discounted utility (DU) model of intertemporal choice is reviewed. Third, anomalies of the standard discounted utility model arising from empirical demonstrations are discussed. While the discussion thus far is more focused on the economics and decision science literature, psychological accounts relating to certain anomalies of the DU model (such as impulsivity, delay of gratification, and self-control) are pertinent to this dissertation and are reviewed as well. Lastly, cognitive (such as construal level theory) and emotional mechanisms (affect-dependent time discounting) underlying intertemporal choice are examined.

4.2 Intertemporal Choice

Intertemporal choice refers to a choice or tradeoff between options that have consequences actualizing in different points in time, whereby the options with immediate consequences entail a penalty or smaller benefit, and options with delayed consequences offer a larger benefit. We are constantly faced with intertemporal choices in our lives. Some examples include: choosing between a tempting chocolate cake and a healthy fruit salad, receiving a gift certificate with a smaller denomination today or a larger denomination three months from today, saving money for retirement or going on a vacation, and going out to a party or staying at home to study. In each of the above
examples, consumers face a tradeoff between the value of a proximal option (e.g., tasty and satisfying chocolate cake) and that of a distant option (e.g., unhealthy long-term consequences of the chocolate cake).

Research on intertemporal choice examines different considerations that underlie the phenomenon: time discounting and time preference. Time discounting focuses on any reasons for caring less about a future consequence (Frederick et al. 2002). It considers factors that change the attractiveness of future outcomes. Time preference, on the other hand, looks at preference for immediate outcome over delayed outcome (Frederick et al. 2002). Hence, different attentions have been placed on the types of considerations underlying research in intertemporal choice.

### 4.2.1 Time Discounting and Time Preference

The dominant model of intertemporal choice is the discounted utility (DU) model. In 1937, Samuelson formalized the first generalized model of intertemporal choice that was applicable to multiple periods\(^2\) (see Frederick et al. 2002). In this simplified model, all the psychological explanations documenting the intertemporal choice phenomenon are condensed to a single, unitary parameter: the discount rate. The DU model assumes that consumers discount all future events—regardless of the type of events—at a constant rate:

\[
U_0 = \sum_{t=0}^{T} \delta^t u_t
\]

\(^2\) Note that Fisher's (1930) two-good indifference diagram was difficult to extend beyond two periods.
where $U_0$ represents the present value of a future outcome that may occur between consumption periods $t=0$ to $T$; $u_t$ is the value obtained from outcome at time $t$; and $\delta^t$ is the discount factor or the weight that the consumer attaches at time 0 to the value derived at time $t$ (see Read and Loewenstein 2000). Note that the discount factor and discount rate are related as follows:

$$\delta^t = \left(\frac{1}{1+\rho}\right)^t.$$ 

$\rho$ is the consumer's discount rate, or pure rate of time preference. Hence, the smaller the discount factor (the higher the discount rate), the more consumers discount future events. In most cases, $\delta^t$ assumes a value less than 1 (implying a positive time preference, or a greater preference for immediate consumption); however, there are also instances in which the discount factor assumes a value greater than 1 (implying a negative time preference, or a greater preference for delayed consumption).

The constant discount rate of the DU theory over time, as can be seen from the model, results in an exponential discounting function. However, a plethora of research in both economics and psychology identified a number of anomalies that deviate from predictions made by the DU model in empirical data. The following are among the most widely discussed anomalies when consumptions are portrayed as separate events: (a) discount rates are not constant but actually decline over time of delay (hyperbolic time discounting); (b) discount rates are related to the magnitude of outcomes, where small payoffs are discounted at a faster rate than large payoffs (the magnitude effect); (c) a loss/gain asymmetry in discount rates is observed, where gains are discounted at a faster rate than losses (the sign effect), as suggested by prospect theory; and (d) discount rates
are reference-dependent, where payoffs framed as delays are discounted at a faster rate than comparable payoffs framed as acceleration relative to a reference point (the delay-accelerate asymmetry; see Loewenstein and Thaler 1989).

Anomalies were also documented when consumptions are portrayed as sequences of events: (a) improving sequences are preferred to declining sequences in certain situations, where the DU model would claim the opposite (preference for improving sequences; Loewenstein and Prelec 1993); and (b) spreading consumption over time is preferred, violating the assumption of independence (preference for spread in a sequence; Loewenstein and Prelec 1993). In other words, to compound the confusion, an opposite pattern of discounting—negative discounting—has also been found. But it seems that, among the empirical evidence documenting anomalies to the DU model, decisions involving separate consumption events typically demonstrate positive discounting in which the more desirable outcomes are preferred immediately (Thaler 1981), whereas decisions involving a sequence of consumption events demonstrate negative discounting in which the more desirable outcomes are preferred later (Loewenstein and Prelec 1993).

In short, empirical results have documented many anomalies to the standard DU model, demonstrating that discount rates may exhibit a hyperbolic pattern and can vary across different product categories and contexts, in contrast to the assumption of the DU model that each consumer has a unitary discount rate parameter. Both positive and negative discounting have been found empirically in anomalies involving consumption events that are separate (i.e., one outcome) or in a sequence (i.e., multiple outcomes). In the next
section, I will begin with review empirical evidence on positive discounting, including hyperbolic discounting, impulsivity, and delay of gratification.

4.2.2 Positive Discounting: Hyperbolic Discounting, Impulsivity, and Delay of Gratification

As aforementioned, the standard DU model assumes that the discount rate is constant. It implies that a consumer's intertemporal choices behave in a time-consistent manner, regardless of the characteristics of the consumption (e.g., type, magnitude, valence). However, a number of empirical demonstrations showed violations to the assumptions and implications of the standard discounted utility model. In this section, anomalies relating to the standard DU model are reviewed that illustrate the predicted positive rate of discounting but suggest an unpredicted non-constant discount rate.

One of the most widely documented anomalies to the standard discounted utility model is hyperbolic discounting, which proposes that discount rates decline sharply with the length of time for delay, rather than remaining constant as suggested by the exponential discounting function of the DU model (Ainslie 1975; Loewenstein and Prelec 1992). Consumers are impatient and prefer outcomes for immediate gratification over outcomes that occur in the future (Mischel et al. 1989). This observed pattern implies that preferences may reverse over time, leading to dynamically inconsistent behavior as a function of time delays. Suppose a consumer chooses between two rewards, a smaller-sooner reward (SS) of a $50 gift certificate to be received in a month and a larger-later reward (LL) of a $75 gift certificate to be received in three months. When both rewards
are distant, this consumer may select the larger-later reward of $75. However, hyperbolic
discounting suggests that—as evidenced across a great deal of empirical data—as the
consumer approaches the time when the smaller-sooner reward actualizes, her preference
for the two rewards is likely to change, leading to increased preference for this smaller-
sooner reward (Kirby and Herrnstein 1995). Although this consumer may have selected
the $75 gift certificate when both rewards were distant in time, she may switch and prefer
the $50 gift certificate as she approaches the time when this smaller-sooner reward
actualizes. This consumer has placed a heavier weight on proximal outcomes so when
the time draws near, she violates her own long-term preference. In other words, the
consumer’s preference for the two rewards has reversed, leading to dynamically
inconsistent behavior. This pattern of behavior would not be predicted by the DU model,
which suggests dynamically consistent behavior (i.e., the larger reward is always
preferred across time).

An implication of hyperbolic discounting is the problem of self-control, with time-
inconsistent behaviors or preference reversals (see Ainslie 1975). Ainslie (1975) depicts
impulsiveness by two hyperbolically discounted (delay of reinforcement) curves—one
representing the smaller-sooner reward and the other representing the larger-later reward,
as mentioned earlier. The fact that these two curves cross explains impatience based on
discounting: Consumers are disproportionately attracted to immediately available rewards,
especially as the time of receipt approaches. That is, although they make well-reasoned
choices when outcomes are distant, as time gets closer to the receipt of the earlier reward,
consumers become more likely to impulsively switch from their earlier, prudent choices.
To further explain impulsivity in behavior, Loewenstein (1996) introduced visceral influences—such as hunger, sexual desire, pain—into hyperbolic discounting models (i.e., where $u_t$ includes a vector of visceral states in period $t$). By incorporating visceral influences into intertemporal choice, Loewenstien (1996) showed that certain behaviors can be seen as impatient and impulsive, leading to preference reversals over time. This fills in the gap, as the original hyperbolic discounting perspective cannot account for situational factors other than time delay that may explain impulsive behaviors.

While many of the research efforts in economics focus on specifying the functional form of time discounting, efforts in psychology have focused on how difficult it is for consumers to overcome the desire for immediate gratification that is suggested by hyperbolic discounting in intertemporal choice. Mischel (1986) investigates an important feature of self-control—postponing immediate gratifications in order to attain delayed, but overall more valued, outcomes. Several studies with four-year-old children on the ability to delay gratification revealed that individual differences exist in the ability to access “cool” system strategies in delaying gratifications, which in turn significantly predicted how well these children developed into cognitively and socially competent adolescents (e.g., getting higher SAT scores and coping better with frustration and stress; Mischel, Shoda, and Rodriguez 1989). This program of research suggests that focusing on arousing “hot” features of the rewards makes self-control difficult, but focusing on the more cognitive or “cool” features helps to achieve self-control and delay gratification (see Metcalfe and Mischel 1999).
The need to exercise self-control lies in the frequently negative correlation between short-term and long-term consequences of alternatives. However, although consumers behave more impulsively with temporal proximity to the outcomes, Mischel's program of research on delay of gratification in children illustrates that these unwanted temptations can be overcome (Mischel and Baker 1975; Mischel et al. 1972; Patterson and Mischel 1976; Peake et al. 2002). In marketing, Wertenbroch (1998) demonstrated that consumers are willing to forgo quantity discounts on products that are considered "vices" (goods for which pleasure is immediate but cost is delayed) and pay premium prices for small quantities of these products as a precommitment strategy, preventing over-consumption of vices. Although Hoch and Loewenstein (1991) based their arguments on an alternative model of intertemporal choice, they similarly built on the notion of time-inconsistent preferences in the context of consumer self-control. Self-control is conceptualized as a struggle between desire and willpower, and self-control strategies are aimed at reducing the former and strengthening the latter. According to their reference-point model (which is different from hyperbolic discounting models), time-inconsistent preferences are the result of a shift in reference point due to adaptation of the product, leading to increased temptation. Consumers can reduce temptation through substitution and avoidance of (distraction from) an impulsive product. This topic of the cognitive and affective mechanisms in the delay of gratification and self-control will arise later in a review of the literature (see "4.3.1. Affect-Dependent Time Discounting").

In addition to the effect of time delay on the discount rate and hyperbolic discounting, many studies have suggested the effect of magnitude of rewards on the discount rate,
whereby small rewards are discounted more heavily than large rewards (the magnitude effect). For instance, Thaler (1981) asked participants in a set of hypothetical studies to imagine that they had received a traffic ticket. Given the option to pay for this ticket now or in a year, and asked to indicate how much money they would be willing to pay if payment were delayed, participants were found to be indifferent to a choice (i.e., both options were acceptable) between paying $15 now and $60 in a year (discount rate of 139%), paying $250 now and $350 in a year (discount rate of 34%), and paying $3000 now and $4000 in a year (discount rate of 29%). In other words, rather than having a constant discount rate for various sizes of payoffs, small outcomes are discounted more than large outcomes.

Empirical data have also pointed to the effects of valence of outcomes on the discount rate, concluding that discount rates for gains are greater than for losses (the sign effect). In the same study, Thaler (1981) demonstrated that discount rates imputed from participants’ willingness to pay for traffic tickets (monetary losses) was lower than for comparable questions about monetary gains. This suggests that consumers are more impatient to receive a positive reward than to postpone a negative penalty. In other words, rather than having the same discount rate for outcomes of different valence, gains are discounted more than losses.

Studies have suggested the effects of direction of comparison on the discount rate, in which consumers given the chance to delay consumption (from now to later) show higher discounting than those faced with a comparable decision to accelerate consumption from
later to now (the delay-accelerate asymmetry; Loewenstein 1988). For example, in one of Loewenstein's (1988) studies, participants who were asked to delay receipt of a VCR demanded $126 to postpone the item, whereas participants asked to accelerate would pay only $54 to receive the VCR immediately. A popular explanation underlying this asymmetric discounting is derived via loss aversion in prospect theory: Consumers are assumed to encode delay as losses and acceleration as gains, and losses loom larger than gains. But this explanation is silent on the underlying psychological mechanisms of the phenomenon. Weber et al. (2007) provide a process-level explanation for this observed asymmetry, supporting a constructive-memory account called query theory: Consumers break down valuation questions into component queries, whereby those asked to delay consumption first query their memory for information favoring immediate consumption followed by reasons favoring delayed consumption; and those asked to accelerate consumption do the opposite. Due to memory interference, fewer queries would be generated in the second category, leading to the observed asymmetric discounting between the two situations.

4.2.3 Negative Discounting: Savoring, Dread, and Preferences for Improving and Spreading Sequence

Another assumption of the standard discounted utility model is that the discount rate is usually positive. That is, consumers are predicted to prefer desirable, positive outcomes immediately and to delay undesirable, negative outcomes when possible. The preceding section described situations with the predicted positive discount rates. However, anomalies have been demonstrated when consumption involves certain types of
anticipation (savoring and dread) and especially when consumption activities are portrayed as sequences of events. Note that, according to the discounted utility model, the value of a sequence of consumption events is the sum of the discounted values of each of the events in the sequence. This implies that the discounted values are separable or independent, suggesting that the value of an event experienced at a certain time period should not affect the value of another event experienced at later time period. However, research has shown that consumers' preferences for overall ordering of outcomes do not necessarily correspond to a simple aggregation of their preferences for the individual components (which is assumed in DU model). In sum, it seems that negative discounting patterns may arise in two particular instances: (a) when consumption involves certain non-monetary types; and (b) when consumption involves a sequence of events.

For some non-monetary consumption activities and decisions, consumers may display unusual patterns of devaluation, preferring desirable outcomes delayed but undesirable outcomes immediately. Loewenstein (1987) defines savoring as "positive utility derived from anticipation of future consumption," and dread as "negative utility resulting from contemplation of the future" (p. 667). In an interesting study, he found that participants were willing to pay more to experience a kiss from a favorite movie star delayed by three days than having the same kiss immediately, delayed by three hours, or delayed by one day (Loewenstein 1987), demonstrating the perceived value of savoring. This violates predictions based on standard notions of time discounting, which posit that consumers are impatient and want their desired outcomes as soon as possible.
In the domain of negative outcomes, Loewenstein (1987) found that participants were willing to pay more to have an immediate shock than the same shock delayed, demonstrating dread. This again violates predictions based on notions of time discounting, which suggest that consumers would want to delay undesired outcomes. The explanation offered by Loewenstein (1987) is that, although value of outcomes is still assumed to be discounted over time delay (positive discounting), anticipation of positive or negative outcomes attaches additional value to these outcomes and makes it seem as if the value of outcomes are augmented with delay (negative discounting). In short, for these non-monetary items such as a kiss from a movie star or an electric shock, consumers preferred to postpone desired outcomes and expedite undesired outcomes.

As exemplified by studies in savoring and dread, consumers do not seem to exhibit the same degree of devaluation (i.e., have the same discount rates) across all product categories. Rather, consumers seem to have different rates of discount for various product types, ranging widely from -6% (Loewenstein 1987) to infinity (Ainslie and Haendel 1983; see Frederick et al. 2002). Empirical studies aimed at estimating the discount rates suggest that consumers show intra-individual variability (i.e., within-person variability). A consumer may not be able to resist the temptation of a luscious chocolate cake, but can strongly adhere to his savings plan. Such situations and variable outcomes question the validity of having a unitary, constant parameter for discount rate, as in the DU model.
Related to the idea that consumers like to have something positive to look forward to and savor is the observation that they prefer an improving sequence of events. In choices regarding sequences of consumption events, empirical data have found that improving sequences are preferred to declining sequences, even when the total value of the outcomes is held constant. This implies a negative discounting pattern, with preference for delaying "better" outcomes. Loewenstein and Sicherman (1991) found that many respondents preferred an increasing wage profile to either a declining or a flat (otherwise identical) job profile. Similarly, Loewenstein and Prelec (1993) found that participants preferred to delay the fancy French dinner when it was combined in a sequence with a less preferred Greek dinner (57% of participants), than when it was presented as a single, separate consumption event (20% of participants). In other words, when consumption involves a sequence of events, consumers prefer an improving sequence to a flat or decreasing sequence (negative discounting)—they prefer to be patient and "save the best for last."

Research on preferences for sequences also reveals a preference to spread consumption over time. Rather than having the most desirable consumption events immediately, as would be predicted by the DU model, consumers seem to prefer to space out valuable consumption events over a consumption profile. Loewenstein and Prelec (1993) demonstrated that participants given choices between various dinner schedules for five consecutive weekends preferred (a) the fancy French dinner on the third weekend when it was the only fancy dinner in that schedule, but (b) the fancy French dinner on the first weekend if the schedule contained another fancy dinner. This violates the assumption of
independence that the DU model requires. Similarly, these researchers found in another study that participants who were given two coupons for fancy restaurant dinners (to be used within two years) preferred to schedule the dinners later, delaying the first dinner for eight weeks and the second dinner for thirty-one weeks (Loewenstein and Prelec 1993). In other words, consumers prefer to spread out most desired and less desired outcomes in a sequence of consumption events.

These findings suggest that consumer preferences for or valuations of outcome sequences correspond to some global or “gestalt” properties of the sequence, as opposed to a simple aggregation of preferences for their individual components (as is typically assumed in the DU model). Studies in this area looked at the distribution of outcomes over time as opposed to purely positive vs. negative time preference. For instance, Ariely and Carmon (2003) suggest that consumers evaluate sequences of consumption events based on abstract, global, mental representations containing summary information (e.g., mean, variance, slope, duration) about the overall pleasure of experiences, rather than the sum of individual parts of the experience.

4.3 Cognitive and Emotional Mechanisms Underlying Decisions across Time

4.3.1 Affect-Dependent Time Discounting

Notice that in the brief review above on delay of gratification and self-control, many researchers in these domains distinguish the type of value of the outcomes, using two basic categories of affect-based and cognitive-based values (Loewenstein 1996; Metcalfe and Mischel 1999; Mischel et al. 1989). They typically assume that affect-based values
in the choice situation discount much more steeply over time than do cognitive-based values. Hence, the influence of cognitive values becomes more pronounced with increased time delay than does the influence of affect values. For example, you may feel a strong temptation to consume the chocolate cake offered to you right now (affect-based value) and ignore its unhealthy consequences (cognitive-based value). But when the same offer of chocolate cake is delayed for a month, you may choose to not consume it by thinking more about its unhealthy consequences than its tastiness. Self-control strategies are thus targeted at lowering the influence of the affect-based values (e.g., avoidance of or distraction from the cake) and/or increasing the influence of cognitive-based values (e.g., precommitment to fruit salad).

4.3.2 Construal Level Theory

A popular cognitive approach to the study of intertemporal choice is the construal level theory (CLT), suggesting that psychological distance (e.g., temporal, social, spatial, hypothetical) is an important determinant of the type of characteristics used as a basis of evaluation. Whereas research on affect-dependent time discounting focuses on the type of value of the outcomes, the central claim that CLT makes regards the level of construals of the outcomes. According to CLT, given the same information, consumers mentally represent near events in a more concrete, low-level fashion and distant events in a more abstract, high-level manner (Trope et al. 2007). Low-level construals are complex, unstructured, incoherent, and highly contextualized representations, with an emphasis on secondary information. They tend to be more concrete and detailed in representation, including subordinate, incidental, or less goal-relevant features of events. In contrast,
high-level construals are relatively simple, structured, coherent, and decontextualized representations that neglect secondary details but extract the gist from the information. They tend to be more abstract in representation, including superordinate, core, or goal-relevant features of events.

CLT posits that the attractiveness of an option depends on the value associated with its high-level construal and the value associated with its low-level construal. As a result, time delay of this option shifts a consumer valuation closer in line to what its high-level or low-level construals suggest. A range of studies across different evaluations and behaviors confirm this basic premise: Time delay leads to greater weight placed on the higher-level construals of an option. That is, when the perspective is one of distant events, high-level construals have relatively more influence than low-level construals; but when the perspective is focused on near events, the opposite pattern is discovered. For instance, Trope and Liberman (2000) demonstrated that, with time delay, participants increasingly preferred a radio that has good sound but a poor clock over one that has poor sound but a reliable clock (because sound quality should be a more central or high-level feature than quality of the clock). In another study, these researchers proposed and found that when given two video clips varying in humor and informativeness, participants weighted either feature of the film more heavily with time delay, depending on goal relevance (Trope and Liberman 2000). More specifically, Trope and Liberman (2000) found that participants given a cognitive goal preferred the informative clip with temporal distance, but those given an affective goal preferred the funny clip with temporal distance. Fujita, Trope, Liberman, and Levin-Sagi (2006) posited that, since the distant event is
represented at a higher level, activating a high-level construal should also lead to greater exertion of self-control. They found supporting evidence in evaluations of temptations and behavioral intentions to undertake activities requiring self-control (Fujita et al. 2006). In short, CLT proposes that temporal distance systematically changes consumers' mental representations of outcomes across time, leading to different valuation of outcomes as a function of time.
Chapter 5

Integrating Affect and Time—Affective Experiences across Time

Chapter 2 provided a review of the literature on affect experienced at the time when consumers make evaluations and decisions. Chapter 4 examined the effects of time on decision making and placed an emphasis on the temporal perspectives of decisions. These included (a) how consumers evaluate products or experiences that occur at different times (e.g., time discounting); (b) how their cognitive processes change with different time perspectives (e.g., construal level theory); and (c) the implications of preference-reversal results (e.g., self-control). The goal of the present chapter is to integrate the two streams of literature central to this dissertation—affect and time—and to review literature on the role of anticipated (future) and remembered (past) affect on consumer assessments and decision making. More specifically, this chapter reviews research that focused on how consumers encode and remember past experiences, and how they choose and anticipate future experiences.

5.1 Some Definitions and Terminology

Before continuing, I will first review some terminology used later in the chapter. In general, the term “utility” is an economist’s notion of the subjective satisfaction or pleasure enjoyed or anticipated from an economic transaction (Varian 1999). It can serve as a measurement of the value that consumers place on certain products or services. However, as Kahneman, Wakker, and Sarin (1997) pointed out, there are at least two major types of utilities that should be distinguished: (1) decision utility, which is the
value of an outcome in a consumption decision at the moment of decision (i.e., as a representation of preference), and (2) experienced utility, the hedonic quality or aspect of the realized outcome in the consumption decision at the moment of consumption (i.e., as a hedonic experience; also see Kahneman 1994; Kahneman and Snell 1992).

In some situations, a consumer's decision utility and experienced utility may fail to coincide (see Hsee and Hastie 2006; Kahneman 1994; Kahneman and Snell 1992; Kahneman and Snell 1990; Kahneman and Varey 1991; Kahneman et al. 1997). These situations may occur when decisions are cognitively difficult to make, such as instances where decision utility and experienced utility occur at different points in time. Two such instances arise (a) when consumers cannot accurately forecast the dynamics of their own preferences (including failure to anticipate adaptation or the working of psychological defense mechanism or failure to incorporate visceral influences; Gilbert et al. 1998; Loewenstein 1996; Read and van Leeuwen 1998); and (b) when memories or recollections of past hedonic experiences are inaccurate (see Kahneman and Snell 1990; Kahneman and Varey 1991).

First, decision utility and experienced utility may diverge because consumers fail to accurately anticipate their future preferences. For instance, they may choose something they expect to like at the time of decision, yet find a change in preference at the time of consumption. One such example arises when consumers make a simultaneous choice of multiple items for sequential consumption. In one study, Simonson (1990) asked students to choose three snacks from six options, where one snack would be consumed in
each of three subsequent class sessions. Some students chose all three snacks during the first session (simultaneous choice group), while other students chose only one snack during each session (sequential choice group). It was found that students who chose simultaneously preferred more variety in snacks than did students who chose only at the time of consumption. Similar variety-seeking behavior was found in actual store purchases (Simonson and Winer 1992). In explaining this variety-seeking tendency, Simonson (1990) and Kahn and Lehmann (1991) suggested that consumers may seek variety because they are risk averse and are uncertain about their future preferences. The propensity to excessively seek variety in simultaneous choice is termed "diversification bias" (Read and Loewenstein 1995), and exemplifies a situation where misprediction of future states leads to lower experienced utility and a disconnect between decision utility and experienced utility.

Second, these two types of utility may deviate because consumers often have inaccurate memories of past affective experiences, but they make decisions based on these imperfect memories as proxy for future affective experience. Consumers seek to repeat experiences that were liked in the past and to avoid ones that were disliked. For instance, in clinical settings, it was found that patients’ memories of unpleasant medical procedures affected their decisions about future treatment choices (Erskine et al. 1990). But decisions for the future are likely to be biased if they are based simply on memories that are imperfect and biased. For instance, a common memory bias that consumers commit is the tendency to overweight select moments—the most intense moments and the final moments—of an affective episode in reconstructing the overall experience.
To maximize experienced utility and choose the option that leads to the best experience, it is imperative that consumers predict accurately the hedonic consequences of their given options and follow these predictions (i.e., convergence of decision utility and experienced utility). But as March (1978) pointed out in a seminal paper, “Anticipating future consequences of present decisions is often subject to substantial error. Anticipating future preferences is often confusing” (p. 589). This chapter focuses on why expectations of experienced utility are often inaccurate, examining two causes of divergence between consumers’ decision utility and experienced utility—mispredicting the future and misremembering the past—as they relate directly to both affective experience and time.

5.2 Ways in which Past or Future Affective Episodes Can Enter Current Welfare

Past (remembered) or future (anticipated) experiences can influence consumers’ current reactions in at least two ways. First, consumers can derive pleasure or displeasure from the past or the future as if they were currently experiencing these recalled or anticipated events. For instance, a consumer may derive pleasure by recalling a fun night out with friends at a restaurant with fantastic food, or they may derive displeasure by remembering the terrible table service. Elster and Loewenstein (1992) labeled this “the backward and forward consumption effect,” and defined its two properties: (a) feelings evoked by contemplation of these experiences tend to be of the same valence as the feelings that these experiences evoked when they occurred; and (b) its impact does not necessarily rely on consumers’ current experiences (i.e., instant utility).
Second, consumers can derive pleasure or displeasure from the past or the future through higher-order experiences that alter the context of a current experience, providing new contrasts or standards of comparison that make the current experience seem even more or less pleasurable. For instance, a visitor may derive even greater pleasure from his weekend trip to Cape Cod by recollecting the terrible weather conditions during his last visit, or experience additional displeasure from the same trip by recalling how the car did not break down in the middle of nowhere last time. Elster and Loewenstein (1992) labeled this the *contrast effect*, and identified two of its defining properties: (a) feelings evoked by contemplating these experiences tend to be of the opposite valence with the emotional quality of these experiences; and (b) evoked feelings alter the pleasure or displeasure of consumers' current situations, depending on the nature of current events.

In a related work, Strack, Schwarz, and Gschneidinger (1985) examined how the way in which consumers thought about past affective events can influence their current judgments of well-being. Specifically, these researchers suggested that affective quality of past episodes has a congruence effect on well-being judgments when recalling such events elicits emotions; a contrasting effect occurs when thinking about past events does not elicit emotions in the present. In the latter case, cold cognitive descriptions of these events lead to the opposite effect because the positivity of the event became a point of reference for later judgments. This is somewhat different from Elster and Loewenstein’s (1992) notion of how contrast effect can occur from contemplating past events. Whereas Elster and Loewenstein (1992) attributed its occurrence to the difference in valence of feelings elicited in the present and feelings evoked from contemplating the past, Strack
and colleagues (1985) suggested that the contrast effect occurs when feelings are not elicited in the present. In short, consumers’ past and future experiences can be both a source of direct affective influence (consumption effect) and a reference point that shapes their affective responses to current experiences (contrast effect).

Research has demonstrated that both remembered and anticipated affective experiences are subject to biased evaluations in a systematic manner. Thus, expectations of experienced utility are often inaccurate, whether these expectations come from biased retrospective evaluations of the past or from erroneous anticipations of the future (Shafir and LeBoeuf 2002). This chapter reviews both the literature on prospective evaluation (continued from the preceding chapter) and literature on retrospective evaluations of hedonic experiences, then discusses prospective and retrospective evaluations jointly.

5.3 Looking Forward—Anticipating the Future

Consumers make choices about the future to maximize utility, pleasure and/or happiness. However, they often fail in their objective because they make inaccurate predictions about which options would lead to the greatest subjective well-being. This section reviews: (a) the systematic biases that consumers commit in their prospective evaluations of future affective episodes, and (b) how they derive utility in the present by anticipating future experiences. Some of this review was already discussed in the preceding chapter.

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3 Consumers may also fail to maximize their utility when they make accurate predictions about future consequences of options but are unable to follow these predictions. This scenario was briefly addressed in Chapter 4 under "4.2.2 Positive discounting: Hyperbolic discounting, Impulsivity, and Delay of gratification."
5.3.1 Prospective Evaluations: Impact Bias, Projection Bias, and Hot-Cold Empathy Gaps

Consumers base many decisions on their predictions about future emotional reactions to events, known as “affective forecasts.” But they often have difficulty making accurate predictions of what they desire in the future and how they will act in affective states that are different from their current visceral states (see Wilson and Gilbert 2005).

Consumers often systematically predict their future experiences inaccurately, through one of the following biases: (a) the impact bias, or the tendency to overpredict emotional reactions to future events compared to what happens when these events actually occur (Wilson and Gilbert 2005); and (b) projection bias, or the common tendency to overstate the degree to which future tastes will resemble one’s current tastes (Loewenstein et al. 2003; Loewenstein and Schkade 1999). In particular, projection bias is sometimes labeled “hot-cold empathy gaps,” or known as the tendency to fail to empathize future affective feelings (Loewenstein 2005; Van Boven and Loewenstein 2003).

Research in affective forecasting has demonstrated that consumers often exhibit impact bias in predicting future affective reactions, whereby they overestimate the intensity and duration (i.e., impact) of an affective experience in the future (Wilson and Gilbert 2005). That is, consumers often exaggerate the pleasure or displeasure they will obtain from future hedonic experiences. This can occur even when they have a good understanding of future events and when they are not in a particularly “hot” or “cold” affective state at the time of making predictions (Wilson and Gilbert 2005). For instance, consumers may overestimate how happy they would be (and for how long) with the purchase of a big-
screen LCD television. Similarly, they may overestimate the intensity and duration of their frustration when the television malfunctions.

Past research has identified some causes of impact bias (Wilson and Gilbert 2005; Wilson, Wheatley, Meyers, Gilbert, and Axsom 2000), one being focalism: when consumers make predictions about future feelings, they tend to focus on salient features of future affective episodes and to ignore seemingly negligible but compelling features (focalism; Wilson et al. 2000). This is also known as “focusing illusion” (Schkade and Kahneman 1998). For instance, in one study, Schkade and Kahneman (1998) demonstrated that participants overestimated the degree to which living in California would make them happier than living in the Midwest because they focused on the wonderful California weather and failed to incorporate other important factors that would influence their well-being (e.g., job prospects, traffic).

Another cause of impact bias is sense-making, or the relatively fast and automatic sense-making of novel or unexpected future events. Such events trigger four processes in succession: attention to this self-relevant but poorly understood event, initial emotional reaction to this event, explanation or “making sense” of the event, and emotional adaptation to the event (Wilson and Gilbert 2005). Rationalizing why an unexpected affective event occurred paradoxically weakens its emotional impact. That is, when consumers begin to make sense of the occurrence of positive events, this can reduce the pleasure derived from the events. But if their ability to make sense of events is inhibited, this should prolong the pleasure (Wilson and Gilbert 2005). In one study Wilson,
Centerbar, Kermer, and Gilbert (2005) randomly assigned students who were studying in a library to one of two conditions: They gave students an index card with a dollar coin attached, where the text on some of these index cards made it easy or difficult to explain why the person had received the dollar coin. The study showed that students receiving the difficult-to-explain cards were in better moods five minutes later, but those students making predictions anticipated they would be happier if they received the easy-to-explain cards (Wilson et al. 2005).

A third cause of impact bias is immune neglect, or the failure to recognize how quickly the psychological immune system would “kick in” to protect emotional well-being (Gilbert, Pinel, Wilso, Blumberg, and Wheatley 1998). For instance, Gilbert and colleagues (1998) examined a common belief among assistant professors—that getting tenured would significantly contribute to their happiness—and found that those who failed to achieve tenure were just as happy as those who had achieved it. Those assistant professors who failed to get tenure did not realize how readily they would explain away career difficulties in protecting their emotional well-being once these events happen, hence overestimated the duration of their negative affective reactions. In short, both focalism and sense-making may lead to impact bias in anticipating positive and negative future events, whereas immune neglect can lead to impact bias only in expecting negative future events.

In some situations, consumers may also underestimate the intensity and duration of an affective experience in the future. Imagining one’s future preferences is typically
cognitively more difficult than observing one’s current tastes. Hence, consumers may project their current inclinations as a proxy for future liking, neglecting other contextual factors that may shape the actual experience. This leads to projection bias, or the tendency to exaggerate the degree to which future tastes will resemble current tastes (Loewenstein et al. 2003).

This may occur through the projection bias and the resulting hot/cold empathy gaps—when consumers in a cold, unaroused state make predictions about preference and choices they will make in a hot, aroused, emotional state (Loewenstein et al. 2003; Loewenstein and Schkade 1999). The opposite pattern may also occur through these two effects, whereby consumers overestimate the intensity and duration of an affective experience in the future when making predictions in a hot, aroused state about their preferences in a future cold, unaroused state. Consumers often find themselves in different visceral states (e.g., hungry, tired vs. satiated, rested; Loewenstein 1996). When they try to predict their affective experiences in a different visceral state than the current one, consumers often overly project their current state into their predictions (projection bias; Loewenstein et al. 2003; Van Boven and Loewenstein 2003). For example, when patrons who just finished dinner make predictions about how much they will enjoy a delicious meal the next morning, they tend to underestimate future pleasure (Read and van Leeuwen 1998). Read and van Leeuwen (1998) also suggested that these patrons seem to assume that, since they are full now, they would also be satiated before breakfast the next morning.
Related to the idea of projection bias is the hot/cold empathy gap, mentioned earlier. When consumers are in a cold state, they underestimate the influence of hot affective experiences on their own choices and preferences. For instance, Van Boven and Loewenstein (2003) suggested that, when forecasting how they would react if they were lost in the woods without extra food or water, respondents who had not yet exercised predicted that they would regret choosing not to bring extra food more than water, whereas respondents who had just exercised predicted regret in the opposite pattern. Note that, as Van Boven and Kane (2006) pointed out, it seems somewhat paradoxical that research in affective forecasting has suggested that consumers overpredict their affective reaction to future events, while other research in hot/cold empathy gaps has demonstrated that they also underestimate the influence of hot, affective situations on their choices when in a cold state. Although it is still unclear why this discrepancy occurs, one potential postulation relates to consumers’ lay-beliefs about how to make “good” decisions: that is, to rely on hard, rationalistic attributes in making decisions and to resist influences of contextual or hedonic factors, such as feelings. On the one hand, consumers may recognize that feelings are fleeting and changing (hence the overestimation of future affective responses); on the other hand, they may hold intuitive beliefs that choices are stable and should be based on a more logical, reason-based approach (hence the underestimation of affective influences on future choices; Van Boven and Kane 2006). Hsee and coauthors (2003) termed this tendency to resist affective influence and to rely on rationalistic attributes in making decisions “lay rationalism.”
5.3.2 Utility from Anticipating the Future

As mentioned in the preceding chapter, consumers may derive utility in the present by consuming future events through anticipation. This can occur both via the consumption effect and the contrast effect discussed earlier in Section 5.2. Consumers can derive utility in the present and experience savoring or dread by imagining future events, depending on the valence of the imagined event. Neither savoring nor dread necessarily depend on the utility that consumers would actually get at the time of consumption (i.e., decision utility), but rather on the utility that consumers would currently attain by imagining the future. Hence, consumers can experience pleasures and displeasures before the actual events take place. Studies have found that in anticipating future experiences, consumers prefer to postpone desirable outcomes but to expedite undesirable outcomes (Loewenstein 1987). Consumers can also derive utility from anticipating the future and experience positive and negative feelings in the present by using anticipated future events as a source of comparison. When consumers imagine a pleasant future event, this may become a source of frustration and discontent regarding a current situation (Elster and Loewenstein 1992). Elster and Loewenstein (1992) suggested, however, that an asymmetry may exist in the pleasure and displeasure that consumers obtain in anticipating future events through the contrast effect. In comparing the present and the future, the pleasure derived from downward comparisons does not seem to be as overwhelming as the displeasure derived from upward comparison. Note that both consumption and contrast effects may occur simultaneously, and which effect carries greater weight depends on the specific situation. For instance, Elster and Loewenstein (1992) posited that this possible asymmetry in the pleasure and displeasure
of anticipating future events may be due to the consumption effect carrying a greater weight when the future event is less desirable.

Consumers can also derive utility in the present by anticipating certain arrangements in timing or sequencing of future events. Related to the idea of savoring desirable future events are consumers’ preferences for an improving sequence and a dispersion of events. In choices regarding sequences of consumption events, numerous studies have found that improving sequences are preferred to declining sequences, even when the total value of the outcomes is held constant (Loewenstein and Prelec 1993; Loewenstein and Sicherman 1991). As Elster and Loewenstein (1992) pointed out, the preference for an improving experience can be explained both by backward contrast effect and forward consumption effect. In addition, studies reveal a preference to spread consumption over time—that is, consumers seem to prefer to space out valuable consumption events over a consumption profile (Loewenstein and Prelec 1993). Consumers may also derive utility by anticipating an improving sequence or expecting a spread of most desired (or least desired) outcomes in a sequence of future consumption events. Combining implications from affective forecasting studies and contrast effects, it is plausible that affective experiences in the future seem even more pleasant after contrasting the improvement in future with current stance (rather than just making the current situation look worse). In summary, consumers can derive utility in the present from anticipating the future by savoring or dreading the upcoming event, by using the future event as an evaluative anchor for the current situation, or by arranging a series of future events in an improving and spread-out sequence.
5.4 Looking Back—Reminiscing Over the Past

Presumably, consumers make choices about the future to maximize pleasure. However, they often make these choices by relying on memories of past experiences: We expect to like what was remembered as pleasant and to dislike what was remembered as unpleasant. But to the extent that consumers systematically misremember, which leads to inaccurate evaluations of past experiences, they are unable to make accurate predictions and choices that lead to the greatest subjective well-being. This can in turn result in “miswanting,” or desiring something that consumers erroneously believe will make them happy (Gilbert and Wilson 2000). This section reviews: (a) the systematic biases that consumers exhibit in their retrospective evaluations of affective episodes, and (b) how they derive utility in the present by reminiscing upon past experiences.

5.4.1 Retrospective Evaluations: Peak-End Rule and Duration Neglect

Researchers have similarly examined retrospective evaluations of hedonic experiences, where the focus is on how consumers remember and encode past experiences (whether positive or negative) instead of on how they choose experiences. This program of research suggests that consumers do not take into account the full range of their retrospective assessments of affective experiences. Rather, two related empirical regularities have been repeatedly documented in consumers’ retrospective evaluations of hedonic experiences: the peak-end rule and duration neglect. As in consumers’ mispredictions of their future preferences, feelings, and well-being, the recalled hedonic aspects of past events are subject to biased evaluations that are strongly influenced by the peak and final moments of an experience (the peak-end rule), leading to relative neglect.
for the duration of the affective experience (duration neglect; Kahneman 1994). In some situations, the combination of both overweighing extreme and final moments and neglecting duration of experiences can lead to consumers' preference for prolonged periods of pain (e.g., Kahneman, Fredrickson, Schreiber, and Redelmeier 1993).

In a clinical study, Redelmeier, Katz, and Kahneman (2003) randomly assigned half of the participants to go through an extended procedure (experimental group) where the physician delayed removal of the colonoscope for about a minute beyond the normal time. This modified procedure for the experimental group lengthened the duration of the procedure but made the final moments less painful. Adding an extra period of mild discomfort to the colonoscope procedure should make the overall colonoscopy experience more aversive. However, corresponding to other research examining memories of past episodes, patients exhibited a tendency to neglect the duration and overweight the end moments of the colonoscopy experience. Because the final moments were less painful for these patients than others who received the normal procedure, it was found that retrospective evaluations were less negative in the experimental group. Although memories of the past are subject to systematic errors, consumers are likely to base their future decisions on past experiences. Interestingly, after a five-year follow-up, these patients were also more likely to comply with recommendations to undergo a repeat colonoscopy (Redelmeier et al. 2003). In short, patients' false memory of the colonoscopy experience made them more likely to repeat the procedure in the future. This clinical finding suggests that proximal stimulus information directly influences
affective ratings, and that consumers tend to neglect the scope and to overweight final moments.

Other studies have shown that memories of past events also tend to overweight the peak moments. In addition to a neglect for duration and overweighting of final moments in memory bias, Kahneman, Fredrickson, Schreiber, and Redelmeier (1993) demonstrated that recalled evaluations of pain are significantly influenced by pain experienced both at the peak and at the end state of a hedonic experience distributed in time. In one experiment, participants were exposed to two aversive experiences—a short trial where they immersed one hand in unreasonably cold water and a long trial where they initially repeated the shorter trial but then the water temperature steadily rose to a more tolerable temperature. Participants were then asked which trial to repeat. Most participants chose to repeat the long trial, although it was at least as (if not more) unpleasant as the short trial. Kahneman et al. (1993) interpreted these results as evidence of duration playing a small role in retrospective evaluations of negative experiences, and such evaluations are strongly influenced by the peak and end moments of the recalled event: thus the so-called “peak-end rule.” Similarly, after showing participants film clips that varied in valence (e.g., a puppy playing vs. amputation), duration, and intensity, Fredrickson and Kahneman (1993) found that retrospective evaluations of unpleasant or pleasant film clips seem to be determined by a weighted average of the peaks (“snapshots”) of the actual affective experiences, rather than the duration of these clips.
In the marketing domain Baumgartner, Sujan, and Padgett (1997) suggested that consumers' overall assessments of ads (e.g., liking of ad, emotional experience elicited by ad) are significantly influenced by the peak emotional experience and the final moment of the ad, as well as by the pace at which their online affective reactions improve over time, rather than by duration of the advertisement. A number of studies have also documented the peak-end rule and duration neglect of recalled hedonic experiences across a variety of positive and negative domains (Carmon and Kahneman 1996; Ratner et al. 1999; Redelmeier and Kahneman 1996; Schreiber and Kahneman 2000).

Consumers neglect duration of experiences both globally and additively. Their global retrospective evaluations of past affective episodes seem to be unaffected by the length of actual experience ("global duration neglect"). As discussed earlier, duration of actual positive or negative film clips (Fredrickson and Kahneman 1993) or length of aversive experience (Kahneman et al. 1993) do not seem to influence consumers' global, overall assessment of the experiences. In some instances consumers seem to care about duration, but this concern does not depend on the intensity of the experience in which duration was varied (additive duration neglect; Schreiber and Kahneman 2000).

Ariely and Loewenstein (2000) proposed that two mechanisms related to elicitation methods may influence the weight that consumers place on duration in their evaluations—the goal of the evaluation and the mode of evaluation. The first factor that may affect the weight that consumers place on duration depends on the nature of the evaluation they are asked to make: either to rate the desirability of experiences or choose
between them (i.e., encode vs. choice). When the goal of evaluation is to make a choice, it becomes important to incorporate the duration of experience because the goal of choice would be to maximize utility. However, when consumers are asked to indicate their overall summary experience—whether communicating preference to another person or as an input for future decisions—it seems more useful and sensible to encode a summary measure of desirability that does not take into account duration. The goal of encoding is more complex; for instance, it is more useful not to incorporate duration into summary evaluation, because consumers can then make better decisions about the length of experience later, taking into account future situations. Thus, Ariely and Loewenstein (2000) argued that it may be sensible in the latter case to neglect duration.

The second factor that may affect the weight that consumers place on duration depends on whether consumers evaluate the experiences individually or comparatively (i.e., separate evaluation vs. joint evaluation). Duration may be difficult to evaluate individually, without a basis for comparison. Findings from Ariely and Loewenstein (2000) supported both premises about the weight that consumers place on duration in their evaluations: the goal of the evaluation and mode of evaluation. In sum, these findings regarding retrospective evaluation of past hedonic experiences suggest that the most extreme and most recent experiences have disproportionate influence on consumer assessments of value of a product or service, while duration of experiences plays only a limited role. The neglect for duration and overweighting of final moments both suggest that the most proximal stimulus information has a significant influence on ratings of an affective experience.
5.4.2 Utility from Remembering the Past

Consumers can derive utility or disutility from reminiscing about an experience that occurred in the past. There are various ways in which past experience can influence consumers’ current well-being, some of which were already mentioned earlier: by directly bringing happiness or unhappiness through reliving the experiences (i.e., consumption effect) or by serving as a basis of comparison for judging current experiences (i.e., contrast effect). Both these effects operate through consciousness, and past experience should be remembered to have any effect on current welfare via the consumption or contrast effect. The past experience should also be relevant or at least somewhat related to the current situation to serve as a reference point. Additionally, past experience can shape consumers’ current well-being in three other ways: through the learning effect, Solomon’s opponent-process theory of motivation, and Scitovsky’s Law of Hedonic Contrast (Elster and Loewenstein 1992).

Past experience can influence current utility through the learning effect, as it expands or improves a consumer’s ability to evaluate or enjoy subsequent events (Elster and Loewenstein 1992). This process need not operate through consciousness. For instance, a consumer may not remember much about a foreign, independent film he watched years ago, but this experience may improve his ability to later comprehend other foreign movies from the same region. Another mechanism by which past experience may influence current welfare comes from Solomon’s opponent-process theory of motivation (1980). This effect suggests that consumers have a physiological equilibrating mechanism that acts to neutralize both pleasure and pain; that is, consumers who
experienced pleasure from a positive event that just occurred will immediately experience feelings of the opposite valence (Solomon 1980). But for the opponent-process effect to operate, this event should be real rather than just a memory of it. Lastly, past experience can shape current pleasure through Scitovsky’s Law of Hedonic Contrast (c.f. Elster and Loewenstein 1992). According to this view, pleasure is being produced when the experience of pain terminates, rather than enhanced through a contrast with the memory of pain (Elster and Loewenstein 1992).

5.5 Comparing the Past with the Future
Consumers misremember the past and mispredict the future in systematic ways. As reviewed above, when consumers recalled hedonic aspects of past experiences, their evaluations are usually biased in that they overly emphasize peak and final moments of a recalled experience (peak-end rule), neglecting the length or duration of the experience (duration neglect). When consumers predict future experiences, their assessments are also biased in that they overestimate the impact of an affective experience (impact bias), neglect the extent to which they will be able to cope with adverse events (immune neglect), and fail to account for the difference in experiences when in a different visceral state (projection bias). In short, decisions based on expectations of experienced utility—whether retrospectively or prospectively—can be systematically inaccurate.

Findings from both prospective and retrospective assessments of affective episodes suggest that consumers overemphasize extreme and final moments of experiences and neglect the duration of these experiences. While these experiences can be recalled or
imagined, a great majority of such studies have focused on recalled experiences. In a study using prospective evaluations, Varey and Kahneman (1992) presented participants with hypothetical experiences that varied in duration and pattern of intensity over time and asked them to rate each experience. They found that participants’ global evaluations of the experience profiles were primarily based on intensities at the extreme and final moments, rather than duration of the experiences. Not only do consumers sometimes neglect duration in their summary of experience, they have been shown to be inept at predicting durations. When predicting plausible, negative events, they seem to overestimate the duration of their affective reactions to adverse events (see Gilbert et al. 1998). Returning to retrospective assessments, Redelmeier and Kahneman (1996) asked patients to report the total pain they experienced while undergoing colonoscopy or lithotripsy, and the treatments differed substantially in the amount of time they took (4-67 minutes for colonoscopy and 18-51 minutes for lithotripsy). Their findings showed no significant correlation between the duration of the treatments and patients’ retrospective evaluation of the experiences.

Overall, two defining characteristics of sequences seem to influence consumers’ global evaluations of affective episodes: static (state) gestalt characteristics and dynamic (configural) gestalt characteristics (Ariely and Carmon 2000; 2003). Static gestalt characteristics encompass the “intensity of the momentary experiences (that is, transient states) at particular key points in time” (p. 326; Ariely and Carmon 2003). Examples include the peak-end rule, where consumers’ overall retrospective summary can be predicted by a weighted average of extreme and final moments of the experience.
(Fredrickson and Kahneman 1993). Dynamic gestalt characteristics encompass the "change in the intensity of the transient states as the experience progresses" (p. 326; Ariely and Carmon 2003). Examples include consumer preference for improving consumption sequence and spreading extreme events across a time frame in a sequence (Hsee and Abelson 1991; Loewenstein and Prelec 1991; Loewenstein and Sicherman 1991).

In addition to patterns in retrospective and prospective evaluations of hedonic experiences, there are similarities and differences in how utilities derive from reminiscing about the past and anticipating the future. In terms of similarities in looking backward and looking forward, both consumption and contrast effects may be working concurrently, and their relative strength depends on the relevance of past or future experiences as a point of comparison and on the vividness of recalled or imagined events (Elster and Loewenstein 1992). In addition, the idea that utility is derived both from recalling past events and anticipating future ones implies that pleasant experiences should normatively be placed as distant from the present as possible to derive the greatest pleasure (e.g., extended length of pleasant memory, prolonging savoring), and that unpleasant experiences should occur as close to the present as possible to minimize displeasure (e.g., shortened length of painful memory, reducing dread).

The differences in looking backward and looking forward stem from the nature of the experience itself—events in the past have already occurred, and events in the future are yet to occur. Unlike past events, future events are inherently uncertain. Hence, the
pleasure or displeasure that consumers experience from anticipation depends on the likelihood of occurrence for future events, where (a) under a very small probability of event occurrence, consumers are unlikely to experience any savoring or dread because the event is extremely unlikely to occur anyway; (b) with a very large probability of event occurrence, consumers may experience contrast effects because the event will likely be reframed (e.g., a 90% success rate at passing an interview and getting a new job will likely be mentally reframed as a 10% chance of failing the interview); and (c) with probability in the mid-range, consumers should experience comparable levels of savoring or dread (Elster and Loewenstein 1992). This is because anticipatory feelings largely depend on the images evoked, rather than probability of future event (see Hsee and Rottenstreich 2004; Loewenstein et al. 2001).
Chapter 6

Theory and Propositions

The purpose of this chapter is to introduce a model that integrates two important streams of research: affect and time perspectives. This dissertation seeks to contribute to the two lines of research: (a) by identifying a characteristic of the affective, feeling-based system in judgment and decision making, (b) by positing that certain situational factors may encourage the reliance on feelings in judgments and decisions, and (c) by providing an additional explanation to why the value of outcomes changes overtime. Based on characteristics outlined in the dual system models, my central thesis is that the affective system is more likely to be engaged under a present-orientation. That is, the use of feelings is posited to carry a greater weight in the present time than in the distant time, whether past or future. The rest of this chapter is organized as follows: First, I summarize a review of prior research on time and affect. Next, I derive my main hypothesis based on the characteristics of the dual systems. Then, I explain implications of this main hypothesis by proposing two sets of hypotheses: one hypothesis regarding the weighting of feelings in judgments and decisions, and the other hypothesis regarding the mode of thinking. Finally, I conclude by outlining an overview of studies to test these propositions.

6.1 Overview of Research on Time and Affect

Much research on time has suggested that consumers are impatient and prefer outcomes for immediate gratifications than outcomes that occur in the future (as reviewed in
Chapter 4; Ainslie 1975; Mischel 1974; Mischel et al. 1989). Although they make well-reasoned choices when outcomes are distant, consumers become more likely to switch impulsively from their earlier, prudent choices as time gets closer to the receipt of the earlier reward. Mischel’s delay of gratification paradigm investigates how people postpone immediate gratifications in order to attain delayed, but overall more valued, outcomes (e.g., Mischel 1974; Mischel et al. 1989). Research in this literature typically distinguishes the type of value of the outcomes, between affect-based and cognitive-based values (Loewenstein 1996; Metcalfe and Mischel 1999; Mischel et al. 1989), and assumes that affect-based values in the choice situation discount much more steeper over time than do cognitive-based values. This program of research thus suggests that focusing on affective or “hot” features of the rewards makes people more likely to give into immediate temptation, but focusing on the more cognitive or “cool” features helps to achieve self-control and delay gratification. For example, consumers may feel a strong temptation to consume a chocolate cake offered to them right now (affect-based value) and ignore its unhealthy consequences (cognitive-based value). However, when the same offer of chocolate cake is delayed for a month, consumers may choose not to consume it due to its unhealthy consequences than its tastiness.

Based on these observations, Loewenstein (1996) proposes that the differential accessibility of current and delayed affective reactions is a primary explanation for myopic choices. He discusses visceral influences—such as hunger, sexual desire, pain—and suggests that these drive states lead to impatient and impulsive behavior. Effective self-control strategies are then targeted at lowering the influence of the affect-based
values (e.g., avoidance of or distraction from the cake) and/or increasing the influence of
cognitive-based values (e.g., precommitment to fruit salad; Hoch and Loewenstein 1991;
Wertenbroch 1998). Another interpretation is that some of these effective self-control
strategies aim to lower the accessibility of feelings associated with immediate outcomes.
In sum, research in these domains related to time argues that the intensity of affective
reactions associated with immediate outcomes makes it difficult to exert self-control and
delay gratification.

However, in addition to the more intense feelings associated with immediate outcomes, I
posit that consumers may give heavier weights to their feelings as information in the
present time. My arguments are based on the dual system models reviewed in Chapter 3.
These dual system models typically posit the existence of two systems—the affective,
feeling-based system and a cognitive, reason-based system—characterized by different
evolutionary and processing properties (Dijksterhuis and Nordgren 2006; Epstein 1994;
Evans 2006; Evans 1984; Kahneman and Frederick 2005; Kahneman and Frederick 2002;
Lieberman et al. 2002; Sloman 1996; Smith and DeCoster 2000; Stanovich and West
2000; Strack and Deutsch 2004). The different evolutionary properties and processing
characteristics of the two systems seem to imply that judgments and decisions set in the
present time preferentially activate the affective system.

6.2 An Evolutionary Account of the Affective System

According to a Darwinian perspective, the human mind consists of a set of programs that
were designed by natural selection to help our ancestors solve adaptive problems they
faced (Cosmides and Tooby 2003). As reviewed in Chapter 3, the affective system lies in phylogenetically primitive areas of the brain (e.g., the limbic area) and is shared between humans and animals (Liberman et al. 2002; Epstein 1994). It is acquired by biology or genes over generations, repeated exposure to the environment, and personal experiences (Stanovich and West 2000; Epstein 1994). Over the course of evolutionary time, the affective system has guided our ancestors through choices that they faced in their immediate, present environment (Cosmides and Tooby 2000; Pham 2007). Emotions, as programs of the affective system, are designed to help us cope and function adaptively with recurring ancestral situations: identifying valuable opportunities worthy of pursuit and signaling dangerous threats in which the wrong responses would diminish fitness in the environment (Clore et al. 2001; Tooby and Cosmides 1990). When confronted by a stimulus, emotions help us determine whether approach or withdrawal response is functionally adaptive. The affective system is such a system that “has been sculpted by the hammer and chisel of adaptation and natural selection to differentiate hostile from hospitable stimuli and to respond accordingly....Affective categorizations and responses are so critical that all enduring species have rudimentary reflexes for categorizing and approaching or withdrawing from certain classes of stimuli” (pg. 839, Cacioppo et al. 1999).

The evolutionary past of the two systems is reflected in how the two systems operate and influence behavior. Relative to the affective system, the cognitive system is suggested to be a more evolutionary recent development and uniquely human. Thus, in terms of how they construe the environment, the affective system tends to process information in a
contextualized manner in which concepts are represented in a set of features, learned from past exposure, and the cognitive system tends to be decontextualized. This feature of the cognitive system allows people to abstract away from their surrounding environment and engage in abstract, hypothetical thinking (Evans 2006; Pham 2004), constructing mental simulations of future possibilities that are helpful in planning. Thus, the cognitive system allows people to generate time perspectives (Strack and Deutsch 2004). Research has suggested that animals may be “stuck in time,” unable to remember past events or predict future events (Roberts 2002), perhaps because animals lack the development of the cognitive system. In summary, evolutionary and processing characteristics of the two systems seem to collectively suggest that the design of the affective system is skewed towards the present time, whereas the cognitive system is atemporal and thus has a relatively greater influence on distant times. The central argument of this dissertation is thus the following:

**Main proposition:** The affective, feeling-based (vs. cognitive, reason-based) system is more likely to be engaged when decisions are closer to the present than when they are distant.

This notion is also consistent with evidence from neuroscience. For instance, using fMRI, McClure, Laibson, Loewenstein, and Cohen (2004) examined neural correlates of time discounting while subjects made a series of choices between monetary reward options that varied by delay to delivery. They identified two systems involved in making intertemporal choices: (1) the "beta" area, or emotional area of the brain, is activated by
decisions involving immediately available rewards; and (2) the "delta" area, or deliberative/cognitive part of the brain, is engaged uniformly by intertemporal choices irrespective of delay.

6.3 Hypotheses

The main proposition of this dissertation is that the affective, feeling-based (vs. cognitive, reason-based) system is more likely to be engaged when decisions are closer to the present than when they are distant. This conjecture leads to two sets of hypotheses: (a) weighting of feelings hypothesis, and (b) mode of thinking hypothesis. They are discussed next.

6.3.1 Weighting of Feelings

Past research has suggested that consumers are more likely to rely on their feelings as a source of information under several situations (Pham 2004; Schwarz and Clore 2007): (a) when the judgment is affective in nature or the motives are experiential (e.g., Pham 1998), (b) when other information is either ambiguous or not available (e.g., Gorn et al. 2001b; Isen and Shalker 1982; Srull 1983), (c) when judgment is overly complex and cumbersome (e.g., Schwarz et al. 1987), (d) when they are distracted due to time constraints or competing task demands (e.g., Pham et al. 2001; Shiv and Fedorikhin 1999; Siemer and Reisenzein 1998), (e) when they lack expertise or knowledge in the judgment domain (e.g., Ottati and Isbell 1996).
If the affective system is engaged, this may suggest that affective feelings (moods and emotions) are more likely to serve as a source of information. That is, as programs of the affective system, feelings should be more heavily weighted as input to judgments and decisions once this system is engaged. Since the affective system is more likely to be engaged in the present, this suggests that feelings should carry a greater weight for decisions set in the present time than comparable decisions set in a distant time, whether past or future. Figure 6.1 depicts the relationship between the weighting of affective feelings into judgments and decisions across time.$^4$

**Weighting of feelings hypothesis:** Feelings are more likely to serve as sources of information in judgment and decisions set in the present (or close to the present) than in judgment and decisions set in a more distant time.

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$^4$Note that this figure provides only an illustration to the weighting of feelings hypothesis. I am not necessarily predicting a symmetric relationship of weighting of feelings between the past and the future. In fact, recent research suggests an asymmetric relationship in which people's emotional reactions to future events are more extreme than their emotional reactions to similar past events (Van Boven and Ashworth 2007). Although they examine the intensity of feelings over time, it is possible that the relationship of weighting of feelings across time may also be an asymmetric one.
One potential source of feelings comes directly from the target of judgment (i.e., integral affect). Past research has shown that feelings may serve as a source of information when they arise in reaction to direct exposure to stimulus. For instance, Pham et al. (2001) found that participants were more likely to rely on their feelings from commercials in evaluations when they are under time pressures. Similarly, Shiv and Fedorikhin (1999) found that consumers are more likely to rely on their evoked affective reactions and choose the alternative that is superior on the affective dimension when they are under processing demands. Because consumers are more likely to rely on their feelings for decisions set in the present, the weighting of feelings hypothesis suggests the following when feelings come directly from the stimuli:

\[ H1a: \text{An affectively-superior option is more likely to be chosen when decisions involve a present (vs. distant time) orientation.} \]

Another potential source of feelings comes from those irrelevant to target of judgment (i.e., incidental affect); these feelings happen to be present at the time of judgment. Past research has shown that feelings may also serve as information even when they do not come directly from the target (see Cohen et al. 2008 for review). For instance, Schwarz and Clore (1983) found that participants gave more favorable judgments of life satisfaction under positive mood (as a result of a sunny day) than negative mood (as a result of a rainy day). This is because consumers only have one window to their phenomenal experiences that they sometimes misattribute the feelings they are experiencing incidentally as part of their overt affective reaction to the target (Schwarz
and Clore 2007). However, participants in Schwarz and Clore's (1983) study stopped relying on their feelings when they were made aware of the actual source of their feelings (i.e., the weather). Regarding incidental feelings, the weighting of feelings hypothesis suggests that:

**Hi b:** Consumers are more likely to rely on their feelings for decisions set in the present, even when these feelings are incidental.

Note that the hypothesized tendency to rely on feelings, whether integral or incidental, in the present time is also consistent with the affect-as-information model (see Chapter 2 for more detailed review). Research in affect-as-information (Schwarz and Clore 2007; Schwarz and Clore 1983) literature posits that consumers rely on their feelings when they believe these feelings have informational value about the target of evaluation (Gorn et al. 1993; Schwarz and Clore 1983) and when they seem relevant to the judgment at hand (Pham 1998; Adaval 2001; Young and Wyer 2004). Consumers typically assume their feelings are "about" what is in their attentional space (Schwarz and Clore 2007), which has been termed the aboutness principle (Higgins 1998) or the immediacy principle (Clore et al. 2001). The focus of their attention is more likely to be within their immediate surroundings, and hence feelings seem more likely to be "about" their present environment. This also resembles the Gestalt observation that stimuli presented in close proximity are experienced as connected (Heider 1958; see Schwarz and Clore 2007). Because we typically feel more for what happens in our immediate environment, feelings
may seem more informative and relevant to the decisions we have to make in the present
time than they are to comparable decisions at a distant time.

How do feelings exert a relatively greater influence in the present than in the future?
Feelings may have a greater influence for decisions set in the present than ones set in the
future in one of two ways. First, consumers may use their feelings in the present in a
more automatic fashion. Because feelings are typically considered to be “about” the
present environment (Clore et al. 2001; Higgins 1998; Schwarz and Clore 2007), it may
be more natural to “pick up” this piece of information and rely on one’s feelings in the
present than in the future. This perspective suggests that reliance on one’s feelings in the
present does not require a conscious attribution. Second, alternatively, consumers may
discount and correct their current feelings for future decisions. It is possible that the
reliance on feelings is the default operation across time frames, but feelings may seem
more incidental for future decisions, and hence their informational value is more likely to
be called into question. This perspective suggests that consumers are able to use their
feelings in the future but they consciously discredit (whether correctly or incorrectly) the
informational value of their feelings for future decisions. While the first perspective
suggests that the reliance on feelings is more natural and feelings more likely to be
automatically used in decisions set in the present, the second perspective suggests that
feelings are more likely to be consciously corrected for decisions set in the future.
Consistent with the main proposition and with McClure et al. (2004), because the
affective system is more likely to be engaged in the present, it is expected that the
reliance on feelings is more natural in the present than in the future. Hence, under a
feeling-based assessment, consumers are more likely to rely on their feelings in the present than in the future. But because the cognitive, reason-based system is more atemporal, under a reason-based assessment, consumers are equally likely to use their reasons regardless of their temporal orientations. Put differently, these predictions suggest in the context of integral feelings that:

H2a: For decisions set in the present, consumers are more likely to choose the affectively-superior option under a feeling-based assessment than a reason-based assessment.

H2b: For decisions set in the future, consumers are equally likely to choose the affectively-superior option whether they are using a feeling-based assessment or a reason-based assessment.

Preliminary findings from recent studies seem to support the conjecture that consumers may intuitively associate stronger feelings with the present. Van Boven and White (2007) suggested that affective feelings exhibit an immediacy bias, demonstrating that participants judged immediate emotions to be more intense than temporally distant emotions, even when the actual intensity of these emotions was similar. They argued that participants tend to use the accessibility of emotional information for imminent and distant events as a heuristic of emotional intensity for these events. In related work, Van Boven, Kane, McGraw, and Dale (2007) found that intensity of feelings was negatively correlated with psychological distance: the more intensely people felt about an event, the lower its psychological distance. In one study, they asked participants to write about an
embarrassing event that happened within the last three months either in an emotional manner or a detached manner, and asked them to report how distant these events felt subjectively. Their results showed that participants perceived emotionally described events as psychologically closer than did dispassionately described events, although these events occurred objectively about the same time. This is consistent with previous research suggesting that consumers may hold lay theories about the dynamics of affective states (Igou 2003; Snell et al. 1995). Recent works in marketing also suggested a close association between affective feelings and the present time. Li (2008) argued that exposure to appetitive stimuli can lead to more present orientation in the decision making process, resulting in greater consumption impatience in unrelated behavioral domains. In a series of studies, she found that exposure to pictures of rich desserts and scents of cookies lead to more present orientation, greater preference for smaller-sooner than larger-later monetary rewards, greater preference for vice options over virtue options, and increased likelihood of impulsive purchases under a tight budget. Additionally, Van den Bergh, Dewitte, and Warlop (2008) found that exposure to “hot stimuli,” such as pictures of women in bikini, leads to more impatience in intertemporal choice between monetary rewards. While these studies collectively suggested the close association between affective feelings and present orientation, they tend to document the influence of affective feelings on time horizon—the reverse effect to the weighting of feelings hypothesis. Hence, combining these results with my main hypothesis, this may suggest that the association between time (or more generally, psychological distance) and affective feelings may be an over-generalized phenomenon: a present orientation may
skew judgments toward heavier weighting of affective information, and affective cues may skew judgments toward a present orientation.

6.3.2 Mode of Thinking

Research has documented several characteristics of the affective system in judgments and decision making (for a review, see Pham 2007; Pham 2004). A property of judgments based on feelings is that they tend to be relatively scope-insensitive. That is, when consumers rely on feelings in assessing value, they tend to not take into account quantitative information such as magnitude or scope of the product (e.g., the number of CDs in a bundle) in their subjective valuation of this product (Hsee and Rottenstreich 2004). For example, in one study, Desvousges and colleagues asked participants how much they would pay to save 2,000, 20,000, or 200,000 migrating birds from drowning in uncovered oil ponds, and found that their valuations were comparable irrespective of the number of birds saved (Hsee and Rottenstreich 2004; Kahneman et al. 1999). Kahneman, Ritov, and Schkade (Desvousges et al. 1993) argued that Desvousges et al's questions evoked "a mental representation of a prototypical incident, perhaps an image of an exhausted bird, its feathers soaked in black oil, unable to escape" (p.212). Because people assessed their willingness-to-pay based on the feelings evoked by mental images, and these images usually consist of prototypical representations, quantitative information tends to be lost (1999). Thus, the affective system can lead to a different way of construing the decision problem.
Once the affective, feeling-based system is engaged in the present, this may influence how the decision problem is mentally represented. Time perspectives may influence *how* people think. Specifically, it can be suggested that time perspectives can influence consumers' mode of thinking. As a consequence of engaging the affective system in the present, consumers may engage in a more affective mode of thinking by using their feelings in valuation.

**Mode of thinking hypothesis:** A present-oriented (vs. distant) time perspective activates a relatively more affective mode of thinking.

Relating to earlier discussion that the neglect for scope is typical of the affective system in judgments and decisions, it can be argued that consumers are more likely to exhibit this characteristic associated with the affective system in judgments and decisions—the scope insensitivity bias—for decisions set in the present than for comparable decisions set at the distant times, whether past or future. This leads to second set of specific hypotheses to be tested:

*H3a:* Near future (vs. distant future) decisions are more likely to exhibit the scope insensitivity bias.

*H3b:* Recent past (vs. distant past) decisions are more likely to exhibit the scope insensitivity bias.
Current discussion so far has focused on situations where affective information is available. Different sources of affective influences on judgments and decisions have been considered, including (a) the subjective experiences that are directly related to the judgment at hand (integral affect) and (b) the subjective experiences that are unrelated to the judgment (incidental affect). This thesis argues that time perspective leads to differential weighting of affective information in decisions, but affective information may not always be available or salient in certain contexts. One boundary condition to the current hypotheses regarding the use of affective feelings in judgments and decisions may lie on the availability of affective information. Specifically, feelings can serve as a source of information only when such information is available. When little affective information is available, consumers lack the basis to use their feelings in judgments, even when the affective system may be engaged. In other words, although present orientation may favor outputs of the affective system preferentially, consumers cannot use feelings as information unless it is available.

**H4**: Present-orientation increases the reliance on feelings only when affective information is available.

From an affect-as-information perspective, feelings seem to hold greater informational value about the present environment than the future environment. In other words, the perceived diagnostic value of feelings seems greater for the present than other times. But, for some contexts, feelings may remain informative for decisions set in the distant time. For instance, in a related work, Kim and Rao (2007) hypothesized that consumers are
more likely to use their feelings for distant events than for imminent events. They argued that consumers are unlikely to rely on their feelings for imminent consumptions because such consumptions typically yield a more concrete, piecemeal information processing, whereas distant consumptions yield a more abstract, holistic processing. Mood exerts influence based on these differences in information processing. However, the product categories they used in their experiments were all hedonic in nature (e.g., vacation, dentist appointment). According to Trope and Liberman (2003), temporal distance systematically changes the way consumers construe future events, in which temporally distant events are likely to be based on higher level construals of these events than temporally imminent events. When affective value is associated with high level construals and cognitive value is associated with low level construals, temporal distance may increase the relative weight of affective value (Kahneman et al. 1999). Thus, feelings may be more informative and relevant for distant decisions when affective feelings constitute the essence of the judgment, such as for hedonic events (Pham 1998; Adaval 2001; see also Trope and Liberman 2000, study 5).

\textit{H5:} Present-orientation increases the reliance on feelings more for non-experiential consumption than for experiential consumption.

Feelings are part of a person’s direct phenomenal experience and therefore are subjective and unique to the person experiencing them. They provide important information about a person’s here-and-now situation, summarizing the benign or problematic nature of a person’s immediate environment. Thus, the same general principles can be extended to
other dimensions of psychological distance. These dimensions include social distance (e.g., self vs. other), spatial or physical distance (e.g., in the same room vs. in the next building), or hypotheticality (e.g., reality vs. hypothetical alternatives to reality). For example, Raghunathan and Pham (Trope and Liberman 2003) observed that participants were more likely to incorporate their feelings into decisions for themselves than for others. Related to the current framework, their results can be interpreted as the following: because the affective system is more likely to be engaged with decreased social distance, people are more likely to rely on their feelings when they are making decisions for themselves than making comparable decisions for others. Extending to other dimensions of psychological distance, the weighting of feelings hypothesis and the mode of thinking hypothesis can be restated as the following:

\[ H6: \text{Decreased psychological distance leads to a greater reliance on feelings in judgments and decisions.} \]

\[ H7: \text{Decreased psychological distance leads to a greater neglect for scope in valuation decisions.} \]

An overview of studies for testing these specific hypotheses is discussed next.

6.4 Tests for Effect of Time Perspective on Choice and Overview of Studies

In this dissertation, I hypothesize that the affective system is more likely to be engaged in judgments and decisions that are anchored in the present than in comparable judgments
and decisions that are anchored in a more distant time horizon, whether future or past. The affective system is a system that focuses on the present (rather than on the distant past or distant future) in consumers’ decision making process (Pham 2007). This is because the affective system lies in a more primitive part of the brain, shared between humans and animals (Liberman et al. 2002; Epstein 1994). As a system reflecting our evolutionary past, the affective system helped guide our ancestors through choices that they faced in their immediate, present environment (Pham 2007; Cosmides and Tooby 2000). Consequently, I hypothesize that consumers are more likely to use their feelings in judgments and decisions when the time perspective is closer to the present (e.g., when deciding to rent an apartment for next week) than when the time perspective is more distant (e.g., when deciding to rent an apartment several months into the future; Experiment 1-3), even when these feelings come about incidentally from an irrelevant source (Experiment 4). In other words, the consumers’ time perspectives influence the relative weights they place on the feeling-based versus reason-based systems in judgments and decisions. The reliance on feelings is inherently more natural in the present than in the past or the future (Experiment 3). The greater engagement of the affective system (as reflected by the greater reliance on feelings) in the present should also apply to retrospective time horizons (Experiment 5-6). Note that this mechanism—the reliance on feelings (i.e., weighting of feelings)—is additional and different from the differential accessibility of current and delayed affective responses (i.e., strength of feelings) explanation proposed by previous research in time discounting, intertemporal choice, and self-control.
Recent research has documented that the feeling-based system in valuation tends to be relatively scope-insensitive (Kahneman et al. 1999; Hsee and Rottenstreich 2004). That is, when consumers rely on feelings in assessing value, they tend to not take into account quantitative information such as magnitude or scope of the product (e.g., the number of CDs in a bundle) in their subjective valuation of this product (Hsee and Rottenstreich 2004). As a consequence of engaging the affective system in the present, consumers are more likely to exhibit this characteristic associated with the affective system in judgments and decisions—the scope insensitivity bias—when decisions involve near future perspective than comparable ones that involve distant future perspective (Experiment 7). But this should depend on whether affective information was provided (Experiment 8). Consumers are also more likely to exhibit the scope insensitivity bias when thinking about the recent past than about the distant past (Experiment 9).

The effect of time perspectives on consumers’ reliance on the feeling-based vs. reason-based system in valuation was tested in various marketing contexts, including apartment choices, charitable donations, video game evaluations, and willingness to pay for music CDs. Both direct and indirect methods were employed to assess the use of feelings in consumer judgment and decision making.
Chapter 7

Experiment 1: Test for Effect of Prospective Time Perspectives on Reliance on Integral Feelings (Two Apartment Rentals with Imagined Graduation)

This experiment tested the hypothesis that consumers are more likely to rely on their feelings when the decision horizon involves a near future than when it involves a distant future perspective. This hypothesis was tested in the context of apartment rental. Participants were put into either a near-future or distant-future perspective by a situational prime, and then asked to evaluate two one-bedroom apartments—one that was superior on affective dimensions (e.g., breathtaking views, lots of light) and one that was superior on cognitive dimensions (e.g., bigger rooms, cheaper rent). It was predicted that, when given a choice between these two apartments, participants deciding for the immediate future would have relatively greater preference for the apartment that is superior on the affective characteristics, whereas participants deciding for the distant future would have relatively greater preference for the apartment that is superior on the cognitive characteristics.

7.1 Method

7.1.1 Participants and Design

Sixty-one students (30 males and 31 females, average age = 25.31 years) from Columbia University were randomly assigned (between subjects) to either a near-future or a distant-future condition. They were paid $5 each for their participation.
7.1.2 Procedure and Measure

Participants were seated at individual stations upon entering the lab. As a cover story, they were told that the purpose of this study was to understand how people make choices and their ability to project themselves into hypothetical, but realistic, situations.

Participants were then asked to imagine that they were about to graduate and have been looking for a one-bedroom apartment to rent after graduation. For the time perspective manipulation, they were told that their graduation will take place either in a month (*near future* condition) or in a year (*distant future* condition), which corresponded with the university’s actual academic calendar. Then all participants viewed the description of 2 one-bedroom apartments. Each apartment was described by a picture along with six attributes (three cognitive and three affective attributes): amount of natural light, monthly rent, attractiveness of apartment’s “look,” ease of transportation, size of apartment, and views from the apartment. Cognitive attributes included monthly rent, ease of transportation, and size of apartment, whereas affective attributes included amount of natural light, attractiveness of apartment’s “look,” and views from the apartment. One apartment was superior on the cognitive dimensions (apartment A) and the other apartment was superior on the affective dimensions (apartment B). See Appendix B for manipulation of time perspectives and Appendix C for apartment stimuli used.

Participants were then asked to (a) rate their relative preference between the two apartments on a seven-point scale, anchored by “strongly prefer apartment A” and “strongly prefer apartment B,” and (b) choose between apartments A and B. These two measures formed the main dependent variables of this experiment. They helped assess
whether time perspectives would influence reliance on integral feelings, which would be
demonstrated by greater relative preference and choice for the affectively-superior option.
Participants were also asked to report the following measures for each of the six
apartment attributes on nine-point scales: (a) importance of the apartment attribute in
assessing intention to rent apartment from “not important at all” to “very important”; (b)
how much they feel about the characteristic of this apartment from “does not evoke
feelings at all” to “strongly evokes feelings”; and, (c) how much the apartment attribute
help or appeal to their logical, reason-based assessment of the apartment rental option
from “does not appeal to my logical assessment” to “does appeal to my logical
assessment.”

Then, various manipulation and confounding checks were collected. Participants were
asked to report two checks for time perspective manipulation, a relatively more
subjective measure and a more objective measure: (a) did participants think about the
situation as something that would happen very soon or much later, by three nine-point
items anchored at “the very near future/the very distant future,” “feels very close/feels
very distant,” and “very soon/much later” (α=.93; subjective assessment of time); and, (b)
what time periods were they focused on as they assessed the apartment rental, by two
nine-point items anchored at “next month/one year from now” and “the very near
future/the very distant future” (α=.82; objective assessment of time). Levels of
involvement in evaluating the apartment rentals were measured by three nine-point agree-
disagree items: “I went through the description as if I was really deciding on this
apartment rental”, “I found the task of choosing my apartment rental to be very
interesting,” “I went through the apartment rental description very carefully” (α=.87).

Participants’ subjective feelings were assessed by five nine-point items anchored at
“bad/good,” “unpleasant/pleasant,” “unhappy/happy,” “sad/cheerful,”
“frustrated/comfortable” (α=.95), and demand checks were collected. Finally,
participants reported basic background information including their proximity to
graduation in their respective programs of study.

7.2 Pretest of Apartment Stimuli

For the apartment stimuli, it was necessary to establish that one apartment was perceived
as cognitively-superior (apartment A) and the other apartment affectively-superior
(apartment B). To ascertain that apartment A was indeed the cognitively-superior and
apartment B the affectively-superior option, a pretest of the apartment stimuli was
conducted among an independent sample of 42 students (female=22; average age=22.60
years) from the same subject pool. Participants were given the same decision task of
apartment rental as in the main experiment, but without any manipulation of time
perspectives. Instead, they were randomly assigned to one of two conditions. They were
explicitly instructed to make their rental decisions either on the basis of their subjective
feelings or on the basis of their logical assessments of the apartments. Specifically,
participants in the feelings conditions read the following instructions modeled after Pham
(1998, Experiment 2):
We would like you to make your decision based on how you would feel toward living in the apartments. As you picture either apartment in your mind, would it feel pleasant to live in this apartment or would it feel unpleasant? In other words, would it make you feel happy, proud, excited, etc. to live there, or would it make you feel unhappy, tense, depressed, etc.? As you make your decision of which apartment to rent, please focus on your emotions and feelings toward each apartment.

In contrast, participants in the reasons conditions read the following instructions:

We would like you to make your decision based on your reason and logic. That is, we would like you to evaluate the balance of pros and cons of living in the two apartments. In other words, thinking logically, are there more advantages (pros) than disadvantages (cons) in living in a particular apartment, or are there more disadvantages (cons) than advantages (pros)? As you make your decision of which apartment to rent, please focus on the logical balance of these pros and cons.

After reading these process instructions, the same apartment stimuli were displayed as in the main experiment. Participants were asked to answer the same dependent measures as in experiment 1, rating their relative preference and choosing between apartments A and B. These two measures again served as the main dependent measures of this pretest. Further, participants in the feelings conditions were asked to rate eight emotional
experiences at the sight of each apartment option using seven-point scales anchored by "not at all" and "very strongly": happy, proud, depressed (reverse-coded), tense (reverse-coded), excited, good, unhappy (reverse-coded), and bad (reverse-coded; $\alpha_{\text{apartment } A}=.93$ vs. $\alpha_{\text{apartment } B}=.86$).

Results of this pretest confirmed the design of the apartment stimulus materials. Compared to participants who were explicitly instructed to use their reason-based, logical assessments, participants who were explicitly instructed to rely on their feelings for the apartments had higher relative preference for the affectively-superior apartment ($M_{\text{feeling}}=4.70$ vs. $M_{\text{reason}}=3.04$, $F(1,40)=6.55$, $p<.02$). Their choice between the two apartments exhibited the same pattern, with significantly greater choice share for the affectively-superior option in the feelings (vs. reasons) conditions ($P_{\text{feeling}}=55.00\%$ vs. $P_{\text{reason}}=13.64\%$; $Z=3.11$, $p<.01$). See Figure 7.1 for a summary of the findings from this pretest.

![Figure 7.1. Pretest for apartment stimuli.](image)
Further examination within the feelings conditions, participants' stated emotional experiences at the sight of each of the two apartments were submitted to a one-factor (apartment: A vs. B) within-subject ANOVA. Results showed a significant effect of the repeated factor (F=22.81, p<.0001), indicating that they feel much more pleasant at the sight of the affectively-superior apartment (apartment B; M=5.78) than the cognitively-superior option (apartment A; M=4.00). Hence, results of this pretest confirmed the design of apartment stimuli. Participants preferred and felt more pleasant about the affectively-superior option when they relied on their feelings in making rental decisions, but preferred the cognitively-superior option when they used their reason-based, logical assessment.

7.3 Results of Main Experiment

Four participants were dropped from all analyses due to incomplete questionnaires. All analyses were based on a one-way ANOVA model, with (1, 55) degrees of freedom.

7.3.1 Preliminary Analyses, Manipulation Check, and Confounding Checks

Results demonstrated that the manipulation of time perspective was successful:

Subjective assessment of time perspective was significantly more future-oriented in the distant future condition (M=3.75) than in the near future condition (M=2.93; F=2.46, p=.06, one-tailed). Similarly, objective assessment of time perspective revealed significantly greater focus on the future in the distant future condition (M=5.30) than in the near future condition (M=3.50; F=7.92, p<.01). Participants did not differ in terms
of their levels of involvement or moods (both Fs<1). From the demand check, none of the participants guessed the hypothesis.

In addition to the pretest, an alternative check on the design of apartment stimuli was performed to participants in experiment 1. Their self-reported ratings of how much each apartment attribute evoked feelings and appealed to their logical reason-based assessments were examined. Two new measures were computed: (a) the difference between how much the three cognitive attributes evoked feelings (α=.52) and appealed to logical assessments (α=.80), and (b) the difference between how much the three affective attributes evoked feelings (α=.75) and appealed to logical assessments (α=.81). A one-way repeated ANOVA was conducted using these two measures in a within-subjects factor. Converging with findings of the pretest, results revealed a significant within-subject factor (F=49.51, p<.0001); participants reported the cognitive attributes as appealing more to their logical, reason-based assessments (M=-.64) and the affective attributes as evoking more feelings (M=1.38). Hence, both the pretest and this additional check established that apartment A was cognitively-superior and apartment B was affectively-superior.\(^5\)

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\(^5\) Preliminary analyses showed that age (range between 18 and 64, median age: 23 years) significantly predicted participants’ relative preference between the two apartments, with older participants having higher relative preference for the affectively-superior apartment (β=.06; t(55)=1.86, p<.05, one-tailed). Using logistic regression, this tendency was also reflected in their apartment choice, in which age positively influenced the probability that the affectively-superior apartment was selected (β=.08; X(1)=4.28, p<.05). This pattern of results suggests that older participants were more likely to rely on their feelings in making apartment choices, which is consistent with past research on age-related differences in decision-making (Peters et al. 2000; Yates and Patalano 1999). For instance, Peters and colleagues (2000, 2007) found that age tends to increase the salience of affective information and reliance on affective processing (Peters et al. 2000; Peters, Hess, Auman, and Västfjäll 2007).
7.3.2 Relative Preference and Choice between Cognitively-Superior and Affectively-Superior Apartments

It was predicted that a nearer future time perspective would encourage a greater reliance on integral feelings, leading to greater relative preference and choice for the affectively-superior option. Results indeed revealed a significant effect of time perspectives on participants' relative preference between the two apartments, supporting the hypothesis that participants in the near-future condition preferred the affectively-superior option than did participants in the distant-future condition ($M_{\text{near-future}}=3.45$ vs. $M_{\text{distant-future}}=2.25$; $F=5.85$, $p<.02$). Participants' choices between the two apartments also exhibited the same pattern, with a significant effect of time perspective ($Z=1.96$, $p=.05$): Participants in the near-future condition had a higher likelihood to choose the affectively-superior option ($P=31.01\%$) than did those in the distant-future condition ($P=10.71\%$). These findings are summarized in Figure 7.2.

Figure 7.2. Effect of time perspectives on relative preference between affective-superior and cognitively-superior options (Experiment 1).

Note that age did not differ between the time perspective conditions ($F<1$).
7.3.3 Alternative Explanations

There are three plausible alternative explanations to the above finding that nearer future perspective led to greater relative preference and choice for the affectively-superior option. One potential alternative explanation is that time perspective may have inadvertently changed the intensity of feelings associated with the apartment options. That is, it was possible that nearer future perspective led to more intense feelings (scale value of feelings) experienced with the affectively-superior apartment, rather than greater reliance on integral feelings. This differential accessibility explanation seems unlikely to hold because affect of the apartment stimuli was held constant by presenting exactly the same apartment descriptions across time frames. In addition, analyses showed that time perspective did not predict any of the affective ratings of the six attributes (all p’s > .20). In other words, participants across time perspectives did not differ in their affective ratings or ratings of whether the attributes were more cognitive or affective. This alternative explanation that intensity of feelings changed across time was ruled out and will be further addressed in experiment 3.

A second plausible alternative explanation is that time perspectives may have altered specific attribute importance, and these attributes coincidentally correlated with either affective or cognitive dimensions. In other words, weighting of specific attributes of apartments (unrelated to affect) may have changed with time. For example, suppose that a nearer-future perspective encouraged a greater weighting of the attribute “views from the apartment,” and this attribute correlates with the affective dimension. If this occurred, participants in the near future condition could still exhibit an increased preference for the
affectively-superior apartment using a reason-based process. To test this possibility, importance ratings of each of the six attributes were examined. Principal component factor analysis (with varimax rotation) revealed that importance ratings for the six attributes fell into two factors, where the first factor loaded highly on the affective dimensions and the second factor loaded highly on the cognitive dimensions. Thus, analyses were run on two importance indices: (a) importance ratings on affective dimensions ($\alpha=.78$), and (b) importance ratings on cognitive dimensions ($\alpha=.71$). Results showed nonsignificant effects of time perspective on participants’ importance ratings for the two indices (both $ps>.15$). This ruled out the alternative explanation that participants in both conditions arrived at the conclusion through a reason-based mode of judgment, but time perspectives changed the importance weights assigned to specific attributes.\(^7\)

A third alternative explanation contends that time perspective may have changed whether participants were lexicographic or compensatory in their decision strategy. For example, suppose that a nearer future perspective may have encouraged a greater use of lexicographic rule, and that affective attributes were rated as more important than cognitive attributes. If this was the case, then a change in decision rule across time perspectives would predict the same results. However, analyses showed that cognitive attributes were rated as more important than affective attributes across time perspectives. Specifically, a one-way repeated measure ANOVA with importance indices of cognitive and affective attributes as the within-subject variable showed a significant effect of

\(^7\) Note that the reliance on feelings is a more holistic, global process—participants in the near-future condition preferred and chose the affectively-superior option based on their global feelings towards this option; hence, participants did not differ in terms of their attribute importance ratings for the cognitive vs. affective dimensions.
importance rating (F(1,55)=29.22, p<.0001). Although both the cognitive and the affective dimensions were rated as moderately important, it was found that participants across time perspectives rated the cognitive dimensions as more important (M=7.17) than they rated the affective dimensions (M=6.13). Therefore, this alternative explanation of differential decision strategy across time perspective is ruled out.

7.4 Discussion

Findings from experiment 1 provided initial evidence that participants were more likely to rely on their integral feelings when decisions involve time perspectives closer to the present (vs. distant) time. Participants in the near-future condition were more likely to prefer and choose the affectively-superior option than participants in the distant-future condition did. Moreover, this finding occurred despite participants in both conditions were comparable in their (a) cognitive and affective ratings of the apartment attributes, ruling out the alternative explanation that intensity of feelings associated with the apartments changed with time perspective, (b) ratings of attribute importance, ruling out the alternative explanation that both conditions used reason-based assessments but placed different importance weights on the attributes, and (c) importance ratings of cognitive attributes over affective attributes, ruling out the alternative explanation that decision strategy (lexicographic vs. compensatory) changed with time perspective. Alternative explanations of differential accessibility in feelings and of specific weighting of attributes and across time frames were ruled out and are directly addressed in experiment 3. These findings collectively suggest that participants across the time perspective conditions perceived the apartment stimuli similarly, yet they arrived at different conclusions. In
line with the main hypothesis, I propose that participants arrived at their judgments through different judgmental routes, whereby participants in the near-future condition relied on their integral feelings and participants in the distant-future conditions used a more logical, reason-based evaluation. In the next experiment, I test the effect of reliance on integral feelings using an alternative manipulation for time perspective.
Chapter 8

Experiment 2: Test for Effect of Prospective Time Perspectives on Reliance on Integral Feelings (Two Apartment Rentals with Actual Graduation)

As in experiment 1, this experiment tested the hypothesis that consumers are more likely to rely on integral feelings when the decision horizon involves a near future than when it involves a distant future perspective, in the context of apartment rental. A different, more subtle manipulation of time perspective from experiment 1 was used to help decrease the likelihood of demand artifact. Participants were put into either a near-future or distant-future perspective by thinking about their actual graduation time, and then asked to evaluate the same one-bedroom apartment stimuli as in experiment 1. Two apartments were again presented—an affectively-superior apartment and a cognitively-superior apartment. It was predicted that, when given a choice between these two apartments, near-future graduates would have relatively greater preference for the apartment that is superior on the affective characteristics, whereas distant-future graduates would have relatively greater preference for the apartment that is superior on the cognitive characteristics.

8.1 Method

8.1.1 Participants and Design

Fifty students (38% males, average age = 24.40 years) from Columbia University were categorized (between subjects) as either near-future or distant-future oriented, based on their expected year of graduation.
8.1.2 Procedure and Measure

The overall design of this experiment was identical to experiment 1, except that a natural manipulation of time perspective was used. Participants were seated at individual computer stations and asked to complete a study on the computer. As a cover story, they were told that the purpose of this study was to understand how students make choices and their ability to project themselves into hypothetical, but realistic, situations. Rather than priming time perspectives through hypothetical scenarios as in experiment 1, participants were asked to take a moment to think about their expected graduation from the current program of study. They were then told to picture themselves about to graduate and have been looking for a one-bedroom apartment to rent after graduation. All participants viewed the description of two one-bedroom apartments, which were the same apartment options as in experiment 1. One apartment was superior on cognitive dimensions (apartment A) and the other apartment was superior on affective dimensions (apartment B). See Appendix D for manipulation of time perspectives using anticipated time of graduation and Appendix C for apartment stimuli used.

To assess whether time perspectives influenced their reliance on integral feelings, participants were then asked to (a) rate their relative preference between the two apartments on a seven-point scale, anchored by "strongly prefer apartment A" and "strongly prefer apartment B," and (b) choose between the two apartments. These two measures again formed the main dependent variables of the experiment, in which greater relative preference and choice for the affectively-superior apartment signaled greater reliance on integral feelings. To assess the possibility that greater relative preference for
the affectively-superior option was merely a product of impulsiveness and lower level of involvement, amount of time participants spent viewing the two apartments and indicating their preferences and choices were recorded (in seconds).

Two measures indicating which judgmental process they used for the decision task were collected to further understand the underlying decision process of time perspectives. Participants were asked how they made their apartment decisions using two seven-point, agree-disagree items: (a) “I made my decision of which apartment to rent based on how I would feel toward living in the apartments,” and (b) “I made my decision of which apartment to rent based on the logical balance of pros and cons of living in the apartments.” Then, a process check measure was created by taking the difference between these two items. A higher score on this process measure indicated greater relative reliance on feelings than use of reasons in evaluating the apartments. This measure helped to provide some initial, more direct evidence on the hypothesized process, which could only be inferred from participants’ preferences and choices in experiment 1. Finally, participants were asked basic information such as their anticipated time of graduation for the program they are currently studying.

8.2 Results

Three participants were dropped from all analyses because they indicated having already seen the stimuli before and participating in a similar study (either experiment 1 or 3). Thus, all analyses were based on responses from forty-seven students in a one-way ANOVA model, with (1, 45) degrees of freedom.
8.2.1 Relative Preference and Choice between Cognitively-Superior and Affectively-Superior Apartments

It was predicted that nearer future perspectives would encourage a greater reliance on integral feelings, as illustrated in greater relative preference and choice for the affectively-superior apartment. Results revealed a significant effect of time perspective, induced by thinking about their anticipated time of graduation, on participants’ relative preference between the two apartments. Consistent with findings from experiment 1, nearer-future graduates had greater relative preferences for the affectively-superior apartment (M_{2008}=3.20) than more distant-future graduates (M_{2009}=1.81; F=8.92, p<.01). Nearer future graduates also indicated significantly greater relative choice share for the affectively-superior option (P_{2008}=30.00% vs. P_{2009}=7.40%; Z=1.98, p<.05). Findings of this experiment are summarized in Figure 8.1.

Figure 8.1. Effect of time perspectives on relative preference between affective-superior and cognitively-superior options (Experiment 2).
8.2.2 Process Checks

Participants were asked to indicate how they made their apartment decision. A process check was created from their responses, in which a higher score signaled greater reliance on feelings relative to use of reasons in making rental decisions. A significant effect of time perspective was found in which nearer future graduates placed greater reliance on feelings than reasons ($M_{2008}=-.80$ vs. $M_{2009}=-2.37$; $F=3.71$, $p<.05$, one-tailed), confirming the hypothesis that time perspectives closer to the present prompt a greater weighting of feelings in judgments and decisions. Note that accessibility of feelings was held constant in this experiment because all participants saw the same apartment stimuli, which was also the source of feelings (i.e., integral feelings). This finding on the underlying process complemented results from experiment 1 by providing initial evidence that it was reliance on feelings per se, rather than other considerations correlated with time perspectives, that lead to greater relative preference and choice for the affectively-superior option.

In addition, to assess the possibility that greater relative preference for the affectively-superior option was due to impulsiveness and lower level of involvement, total amount of time participants spent in the decision task were analyzed. The data were log-transformed to correct for their positive-skew and satisfy the normality assumption of ANOVA. Analysis showed a significant effect of time perspectives in which nearer future graduates actually took much longer in evaluating the apartment options and indicating their relative preferences ($M_{2008}=31.59$ sec. vs. $M_{2009}=19.61$ sec.; $F=4.98$, $p<.05$). This pattern rules out the possibility that impatience and lower level of task involvement led to greater relative preference for the affectively-superior option. In this
experiment, near-future graduates were actually more engaged than distant-future graduates in making the apartment rental decisions. Alternatively, it is also possible that greater uncertainty associated with the distant future led to a greater disregard or lower involvement for remote decisions. This possibility could explain the shorter amount of decision time for remote decisions, but seems unlikely to explain the main findings of this experiment for two reasons. First, in experiment 1 there was no significant difference in self-reported levels of involvement across time. Second, greater uncertainty for the future should lead to greater indifference between the two apartments (i.e., a 50-50 divide in preference for the two apartments). In contrast, distant-future conditions in both experiments 1 and 2 indicated stronger preference and choice for the cognitively-superior option ($P_{\text{experiment } 1}=31\%$ and $P_{\text{experiment } 2}=30\%$) than otherwise suggested by the indifference account ($P=50\%$).

8.3 Discussion

Findings from this experiment replicated experiment 1 results using an alternative and more natural way to vary time perspectives. Both experiments 1 and 2 provided initial evidence that participants were more likely to rely on their integral feelings for imminent decisions than distal decisions. For both imagined and actual graduation time, near-future graduates were more likely to prefer and choose the affectively-superior option than distant-future graduates were. Experiment 2 provided further evidence of the underlying process mechanism, illustrating that greater relative preference for the affectively-superior option was driven by a greater reliance on feelings in the near-future. Experiment 2 further asserted that greater relative preference for the affectively-superior
option was not merely caused by impatience or lower task involvement under a nearer-future perspective. These findings suggest that weighting of feelings is a distinct and separate mechanism to accessibility of feelings in explaining consumer impatience. Consumers are more likely to rely on their integral feelings under a present orientation even when the intensity of feelings (coming directly from the target stimulus) is held constant. In line with the main hypothesis, it is proposed that time perspectives naturally encourage different judgmental routes, whereby near-future graduates placed relatively greater reliance on their integral feelings than did distant-future graduates. Note that in experiments 1 and 2 greater reliance on feelings in the near-future condition was inferred through greater relative preference and choice for the affectively-superior option (as further suggested by experiment 1’s pretest). In the next experiment, I directly examine the judgmental processes underlying different time perspectives.
Chapter 9

Experiment 3: Test for Effect of Prospective Time Perspectives on Reliance on Integral Feelings (Process Instruction)

Using both imagined and actual anticipated time of graduation, experiment 1 and 2 tested in the context of apartment rental the hypothesis that consumers are more likely to rely on their feelings and preferred the affectively-superior option when the decision horizon involves a near future than when it involves a distant future perspective. Both experiments inferred participants’ reliance on feelings from their relative preference and choice between the affectively-superior and the cognitively-superior options. In this experiment, I directly manipulate participants’ underlying judgmental processes—the reliance on feelings or reason-based assessments—to examine how these processes interact with time perspectives, which are hypothesized to naturally encourage a relatively more feeling-based processing in the present.

As in experiment 2, participants were put into either a near-future or a distant-future perspective by asking them to think about their anticipated time of graduation. Then, they were explicitly instructed to evaluate two one-bedroom apartments (the same ones as those used in experiment 1-2) using either their feelings toward the apartments or logical assessments of the apartments. It was predicted that the use of feelings in judgment would be relatively sensitive to temporal orientations, because feelings are naturally weighted more heavily in the present. In comparison, the use of reasons would be atemporal. Hence, process manipulations (whether to rely on feelings or use reasons) should have a significant influence on near-future decisions. But, because weighting of
feelings in the future is difficult or unnatural, process manipulations would have little influence on distant-future decisions. In short, reliance on feelings as a judgmental route for making decisions is more likely to be used in decisions about the present than ones about the future.

9.1 Method

9.1.1 Participants and Design

Sixty-four students (27 males, average age = 24.30 years) from Columbia University whose expected year of graduation was either this year or next year were randomly assigned (between subjects) to either feelings-based or reasons-based conditions. Based on their expected year of graduation, they were then assigned to either a near-future (if anticipated graduation was this year) or a distant-future condition (if anticipated graduation was next year).

9.1.2 Procedure and Measure

Participants were seated at individual computer stations upon entering the lab. As in experiments 1 and 2, they were told a cover story that the purpose of this study was to understand how people make choices and their ability to project themselves into hypothetical, but realistic, situations. As in experiment 2, participants were first asked to take a moment to think about their expected graduation from the current program of study and imagine that they were about to graduate and have been looking for a one-bedroom apartment to rent after graduation. But in contrast to earlier experiments, participants were then given explicit instructions on which judgmental process to use in making the
decision of which described apartment to rent. Half of the participants were randomly given *feelings-based* instructions, which encouraged them to make their decisions based on how they would feel toward living in the apartments, and the other half of the participants were randomly given *reasons-based* instructions, which encouraged them to make their decisions based on their reason and logic of living in the apartments. These were the same instructions used in pretest of apartment stimuli in experiment 1 (see 0).

After participants read these process instructions, they viewed the same description of 2 one-bedroom apartments as in experiments 1 and 2. Note that one apartment was superior on the cognitive dimensions (apartment A) and the other apartment was superior on the affective dimensions (apartment B). See Appendix C for apartment stimuli used.

Participants were then asked to indicate their relative preference between the two apartments on a seven-point scale, anchored by "strongly prefer apartment A" and "strongly prefer apartment B," and choose between the two apartments. These two measures served as the main dependent measures. They helped assess how time perspectives and explicit instructions on which judgmental process to use interact to influence reliance on integral feelings, as demonstrated by greater relative preference and choice for the affectively-superior option. Amount of time participants spent viewing the two apartments and indicating their preferences and choices were also recorded (in seconds), and served as a proxy for levels of involvement in the task.

Several checks were collected to affirm the manipulation and design of this experiment. As a manipulation check on whether they adopted the judgmental process they were
instructed to use, participants were asked how they made their rental decision using two seven-point, agree-disagree items: (a) “I made my decision of which apartment to rent based on how I would feel toward living in the apartments,” and (b) “I made my decision of which apartment to rent based on the logical balance of pros and cons of living in the apartments.” To further check the design of apartment stimuli, participants in the feelings-based conditions were asked to rate eight emotional experiences at the sight of each apartment option using seven-point scales anchored by “not at all” and “very strongly”: happy, proud, depressed (reverse-coded), tense (reverse-coded), excited, good, unhappy (reverse-coded), and bad (reverse-coded; $a_{\text{apartment A}}=.94$ vs. $a_{\text{apartment B}}=.75$). Participants were expected to feel more positive at the sight of the apartment B (the affectively-superior option) than apartment A (the cognitively-superior option). In contrast, participants in the reasons-based conditions were asked to rate their specific evaluation of each apartment using two seven-point scales anchored by “This apartment is not worth renting/This apartment is worth renting” and “This apartment is satisfactory/This apartment is unsatisfactory” (reverse-coded; $a_{\text{apartment A}}=.74$ vs. $a_{\text{apartment B}}=.79$). These participants were expected to give higher specific evaluation for the cognitively-superior option than the affectively-superior option. Finally, participants were asked basic information such as their anticipated time of graduation for the program they are currently studying.

9.2 Results

Participants were divided into near future and distant future conditions based on the year of anticipated graduation they indicated at the end of the study, either this year (in 2008)
or next year (in 2009), respectively. This served as another factor in addition to the manipulation of judgmental process in the study. Thus, main analyses were based on a 2 (time perspective: this year vs. next year) x 2 (judgmental process: feelings-based vs. reasons-based) ANOVA model, with (1, 60) degrees of freedom.

9.3.1 Preliminary Checks

To ensure that process manipulations worked and to further understand the underlying judgmental processes, a new measure was created by taking the difference between participants' agreements on whether they relied on feelings towards the apartments and whether they balanced the pros and cons of living in the apartments in making the rental decisions. Higher score on this measure indicated greater relative reliance on feelings over reasons. Results confirmed the effectiveness of process manipulations, revealing a significant main effect of process manipulations in which feelings-based instructions encouraged greater relative reliance on feelings over reasons in making rental decisions than did reasons-based instructions (M\text{feelings}=-.48 \text{ vs. M}_\text{reasons}=-2.25; F=5.49, p<.03). In addition, results showed a significant main effect of time perspective in line with the hypothesis: Nearer future graduation increased relative reliance on feelings over reasons (M\text{2008}=-.42 \text{ vs. M}_\text{2009}=-2.31; F=6.25, p<.02). The interaction effect between process manipulation and time perspectives was nonsignificant (p=.3), suggesting that the effects of process manipulation and time perspective on reliance on integral feelings may be additive rather than interactive.
As additional checks for the design of the apartment stimuli, further examination within the feelings-based conditions showed that participants felt significantly more positive at the sight of the affectively-superior apartment (M=5.80) than the cognitively-superior option (M=4.56; F(1,30)=16.95, p<.001). This result replicated findings from the pretest in experiment 1. In contrast, analysis of the reasons-based conditions showed that participants thought the cognitively-superior apartment was more satisfactory (M=5.42) than the affectively-superior apartment (M=4.61; F(1,30)=12.56, p<.01). Therefore, these results additionally confirmed the design of apartment stimuli.

9.3.2 Relative Preference and Choice between Cognitively-Superior and Affectively-Superior Apartments

It was predicted that, for participants deciding for the immediate future, those explicitly instructed to rely on their feelings (vs. use their logical assessments) would have greater (less) preference for the apartment that is superior on the affective characteristics. This is because nearer future perspectives should encourage a relatively greater reliance on integral feelings, and a match between feelings-based process manipulation and time perspective close to the present promotes a greater relative preference and choice for the affectively-superior option. But, for participants deciding for the distant future, it would be difficult and unnatural to use their feelings even when they were explicitly instructed to rely on their feelings for making the apartment evaluation. While weighting of feelings should be sensitive to the time perspectives adopted, use of reasons should be atemporal. Therefore, in deciding for the distant future, there should be no difference in relative preference for the affectively-superior apartment between those who were
instructed to rely on their feelings and those who were instructed to use their logical assessments. In short, the reliance on feelings as a judgmental process depends on the time orientation adopted, particularly one that is close to the present time. I predicted an interaction between process manipulation and time perspectives, with a significant difference between feelings-based and reasons-based judgmental processes within near future conditions and a nonsignificant difference between the process conditions within distant future conditions.

Results revealed a significant main effect of process manipulation on participants' relative preference between the two apartments, indicating not surprisingly that feelings-based instructions promoted greater relative preference for the affectively-superior apartment than did reasons-based instructions (M\textsubscript{feelings}=3.92 vs. M\textsubscript{reasons}=2.80; F=4.61, p<.05). This pattern echoed results from the pretest reported in experiment 1. A marginally significant main effect of time perspective was also found, demonstrating again that nearer time to graduation encouraged greater relative preference for the affectively-superior apartment (M\textsubscript{2008}=3.80 vs. M\textsubscript{2009}=2.92; F=2.87, p<.10). These main effects were qualified by a significant interaction effect of the two factors (F=7.44, p<.01), revealing a significant effect of process manipulations on relative preference for the affectively-superior apartment for near future graduates (M\textsubscript{feelings}=5.07 vs. M\textsubscript{reasons}=2.53; F=11.88, p<.001) and a nonsignificant effect of process manipulations for distant future graduates (M\textsubscript{feelings}=2.76 vs. M\textsubscript{reasons}=3.07; F<1).
Under a near future perspective, participants were able to either rely on their feelings towards the apartments or use their logical assessments of the two apartments based on the judgmental processes they were instructed to use. Thus, those near future graduates who were instructed to rely on their feelings towards the apartments indicated significantly greater relative preference for the affectively-superior apartment than those near future graduates who were instructed to use their reasons. In contrast, under a distant future perspective, participants seemed unable to rely on their feelings towards the apartments as a basis for judgment, even though they were explicitly instructed to do so. Hence, distant future graduates indicated comparable relative preference for the affectively-superior apartment regardless of which judgmental process they were instructed to use. Supporting these conjectures, an alternative look at the simple effects showed a significant effect of time perspective within feelings-based process conditions—in which near future graduates had significantly greater relative preference for the affectively-superior apartment than distant future graduates did ($M_{2008}=5.07$ vs. $M_{2009}=2.76$; $F=9.78, p<.01$)—and a nonsignificant effect of time perspectives within reasons-based process conditions ($M_{2008}=2.53$ vs. $M_{2009}=3.07$; $F<1$). This finding indicates that reliance on feelings as a decision process is strongly contingent on adopting a perspective closer to the present.

Due to small counts and few choices made in some cells, participants’ choices for apartments could not be reliably tested using logit model as a function of process manipulation, graduation year, and their interaction. Hence, the interaction effect was directly tested using test for differences in proportion. A significant interaction of time
perspectives and process manipulations was found ($Z=2.17$, $p=.03$). Then, further examination into the nature of this interaction was conducted while controlling for the two time perspectives. For near future graduates, they were significantly more likely to choose the affectively-superior option when encouraged to use their feelings than reasons ($P_{\text{feelings}}=66.7\%$ vs. $P_{\text{reasons}}=11.8\%$; $z=3.80$, $p<.0001$). But this pronounced relative choice share was greatly reduced among distant future graduates, although those encouraged to rely on their feelings were more likely to choose the affectively-superior option than participants encouraged to use their reasons did ($P_{\text{feelings}}=17.6\%$ vs. $P_{\text{reasons}}=0\%$; $z=1.91$, $p<.10$). Again, an alternative look at the pattern of interaction in relative choice share (controlling for process manipulation) illustrated a significant effect of time perspectives within feeling-based conditions, in which near future graduates had significantly greater choice for the affectively-superior option than did distant future graduates ($P_{2008}=66.7\%$ vs. $P_{2009}=17.6\%; z=3.21$, $p<.01$). In contrast, choice shares for the affectively-superior option were comparable between near future graduates and distant future graduates within reason-based conditions ($P_{2008}=11.8\%$ vs. $P_{2009}=0\%$; $z=1.51$, $p=.13$). These findings are summarized in Figure 9.1.
9.3.3 Alternative Explanation

A plausible alternative explanation is that greater uncertainty associated with the distant future led to greater disregard for remote decisions. It is possible that among distant-future graduates the similarity in relative preference for apartments between the feeling-based and reason-based process conditions was due to lower involvement in making remote decisions. However, results showed a significant main effect of time perspectives (F=11.77, p<.01) on the amount of time participants took to make decisions, whereby participants took much longer to make remote decisions than imminent decisions (M_{2009}=144.03 seconds vs. M_{2008}=89.8 seconds). There was no main effect of process manipulation or interaction effect of the two factors (both F’s<1). This finding suggests that distant future graduates were actually more involved and took longer than near future graduates in making apartment rental decisions. It also indicates that projecting into a
distant future perspective is more difficult than one closer to the present. Hence, this alternative explanation of time discounting seems unlikely. Note that it is interesting how this result on decision time for experiment 3 is in contrast to findings from experiment 2. In the earlier experiment, the reverse pattern was found whereby nearer future perspectives took significantly longer time in evaluating the two apartments. It is possible that because process instructions were given prior to the decision task in the current experiment, both manipulations of time perspective and judgmental process caused distant-future graduates to take the task much more seriously. Overall participants across all conditions took significantly longer in evaluating the apartments after they received process instructions (experiment 3) than without receiving these instructions (experiment 2).

9.4 Discussion

Findings from this experiment provided preliminary and direct evidence on the underlying judgmental process of time perspectives. Replicating results from experiments 1 and 2, participants were found to be more likely to rely on their integral feelings when decisions involve time perspectives closer to the present (vs. distant) time. Near-future graduates have greater relative preference and choice share for the affectively-superior option than distant-future graduates. Also, replicating previous research, participants who were instructed to rely on their feelings were more likely to prefer the affectively-superior apartment than participants who were instructed to use their reasons. However, more importantly, this reliance on feelings in selecting a rental apartment depended on the time perspectives participants had: near-future graduates were
able to rely on feelings when instructed to do so, but distant-future graduates who were asked to rely on their feelings were unable to do so even when they were explicitly instructed to adopt a feeling-based process in making their rental decisions. This suggests that the reliance on feelings is inherently more natural in the present than in the future.

This experiment thus provides additional evidence of the underlying judgmental process across time orientations. It further demonstrates the unique property of feelings for judgments and decisions in the present. Whereas the use of reasons in judgments and decisions is atemporal, the reliance on feelings is distinctive only for the present (see Pham 2004). This observation is consistent with the evolutionary properties of various dual-systems framework discussed in Chapter 3 and recent neuroscience findings. For example, in a fMRI study of intertemporal choice, McClure et al. (2004) found that areas of the brain commonly associated with affective processes show greater activity when an intertemporal choice includes an immediate reward than a delayed reward (exhibiting a bias to immediacy), but areas of the brain associated with deliberate cognitive processes respond to all intertemporal choices equally. Complementing McClure et al’s (2004) findings, experiment 3 examined the weighting of feelings hypothesis and illustrated that reliance on feelings is sensitive to time orientations.

One interesting finding from this experiment is that the effects of time perspective and process instruction on participants’ relative reliance on feelings were additive. This process measure—participants’ relative reliance on feelings—predicted significantly the
relative preference for the affectively-superior apartment ($\beta = .17$; $t(62) = 1.97$, $p < .05$, one-tailed). It did not mediate the interactive effect of time perspective and process manipulation on participants’ relative preference for the affectively-superior option. Although there is not necessarily a theoretical basis to expect an interactive effect of the two factors on the process measure, the interesting question is: Why didn’t the relative reliance on feelings mediate the effects of time perspective and process manipulation on participants’ relative preference for the affectively-superior option? How does the significant main effects of time perspective and process instruction on the process measure reconcile with the interactive effect of these two factors on participants’ relative preference? One speculation is that, in addition to changing the relative weighting of affective inputs, time perspective may have influenced participants’ initial representation of the target objects. Under a near future perspective, feelings from the affectively-superior option get accessed along with other types of inputs. But under a distant future perspective, representation of even the affectively-superior apartment may become affect-free. The relative weighting of affective inputs then depends on the information available from this initial representation. If the representation lacks affective information, participants cannot use it as a basis for decision. Therefore, when distant-future participants were explicitly instructed to rely on their feelings, they may not be able to do so because they lack this source of information for the apartment decision. This is similar to Pham’s (1998) suggestion that people’s representation of the target object tends to be affect-free under an instrumental motive. In short, this conjecture posits a two-stage process. First, time perspective alters mental representation of the target objects. Then, it changes the relative weighting of affective inputs based on this representation. A future
study can test this possibility by manipulating participants’ feelings through unrelated sources. This can help “provide” an affective basis for distant-future participants who were instructed to rely on their feelings. When affective inputs are available for judgments through unrelated sources, it is predicted that results would reveal a significant interaction effect of time perspective and process manipulation on the process measure. This conjecture awaits further empirical corroboration.

It is proposed that time perspective naturally prompts one judgmental route over another, in which the reliance on integral feelings is strongly contingent on a present-orientation. Results of this experiment support this conjecture by directly manipulating either a feeling-based or a reason-based judgmental process and examining how this interacts with time orientation. Because the source of feelings came from the target stimuli directly, the intensity of feelings was held constant across time perspectives. By manipulating judgmental processes, this experiment again showed that the differential weighting of feelings affects decision making across time perspectives independently of the differential accessibility of feeling. It also provides more direct evidence on the hypothesized judgmental process underlying time perspectives. The next experiment is a further examination of this prediction using a different source of feelings—incidental feelings, or feelings that are caused by sources unrelated to the decision task at hand.
Chapter 10

Experiment 4: Test for Effect of Prospective Time Perspectives on Reliance on Incidental Feelings (Single Apartment Rental)

In this experiment, I tested the prediction that consumers are more likely to rely on their feelings for decisions closer to the present (vs. distant future), even when the feelings come about incidentally from an irrelevant source. The purpose of this experiment is multiple-folds: (1) to directly rule out the possibility that content of attributes themselves, rather than reliance on feelings, changed with time frames, (2) use a different, purer measure of affective feelings, (3) to rule out the differential accessibility of feelings explanation by directly manipulating feelings, and (4) to further test that time perspective affects weighting of feelings per se.

In this experiment, the information content was held constant by providing only one apartment to evaluate, but participants’ feelings about this particular apartment was explicitly varied. This experiment was presented as two ostensibly unrelated studies. In the first study, participants were shown video clips that induced either positive or negative moods. In the second study, they were shown descriptions of an apartment rental option and asked to rate their intention to rent this particular apartment, imagining that they are searching for an apartment to rent after they graduate in a month or in a year.

Past research has suggested that affect may be used as a source of information in making evaluative judgments. According to this affect-as-information approach, affective reactions may provide informational value of the target object, especially when they are
perceived to be relevant and representative to the judgment at hand (Schwarz and Clore 1983). The aim of this experiment is to show the unique information value of feelings for decisions close to the present, by manipulating mood outside of the main apartment evaluation task, without changing the specific evaluative content of the target evaluation. It was predicted that, because consumers are more likely to rely on their feelings for decisions closer to the present, momentary moods would have a stronger influence on decisions with outcomes that occur in near future than the same decisions with outcomes that occur in distant future. In other words, affect, as a heuristic for assessing value, is more likely to be used in decisions about the present than ones about the future.

10.1 Methods
10.1.1 Participants and Design
One-hundred and fourteen students\(^8\) from Columbia University (56 males and 58 females, average years 23.33 of age) who were paid $7 for their participation were randomly assigned to one of the 4 conditions of a 2 (mood: positive vs. negative) x 2 (time-perspective: near future vs. distant future) between-subjects design.

10.1.2 Procedure and Measures
This experiment was administered as two supposedly unrelated studies. In the first study, participant’s mood was manipulated using the same procedure as in Avnet and Pham (2007). Under the cover story of studying people’s ability to comprehend the gist of

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\(^8\) Past research has suggested that there may be significant variance in the effect of mood-inducing videos across participants (Cohen, Pham, and Andrade 2008). Hence, a large number of participants was needed to detect the influence of time perspectives and incidental moods.
short clips, participants were asked to view and rate two movie clips. All participants viewed the same first clip, which was a 5-minute video about the Lewis and Clark expedition, which was intended to neutralize preexisting mood states, disguise the mood manipulation introduced in the second clip, and reinforce the cover story. The second clip showed an approximately 8-minute video from either a Bill Cosby stand-up comedy (positive mood) or a section from the movie *Lorenzo’s Oil*, about a boy who develops a rare, incurable disease (negative mood). Participants were then asked to answer a set of movie comprehension questions to complete the cover story.

In the ostensibly unrelated second study, participants were given the same instructions as experiment 1 except that only the affectively-superior apartment was given to evaluate. Again, they were asked to place themselves in a hypothetical situation, imagining that they are about to graduate and have been looking for a one-bedroom apartment to rent after graduation. This hypothetical graduation would take place either in a month (near future) or in a year (distant future). Then all participants viewed information of a one-bedroom apartment and asked to rate their intention of choosing to rent this apartment after their college graduation on a nine-point scale anchored by “I would definitely not rent this apartment” and “I would definitely rent this apartment,” as well as how much rent they are willing to pay for this apartment had the rent not been set already. These two measures served as the main dependent measures of this experiment in testing the effect of time perspectives and incidental moods on reliance on feelings in evaluations and decisions.
To further assess that it is the weighting of feelings in judgment per se, rather than a change in specific evaluative contents across time perspectives, participants were also asked to report on nine-point scales their specific evaluations of this apartment rental option on three items at “I have a favorable opinion of this apartment/”I have an unfavorable opinion of this apartment,” “I find this apartment very interesting/I don’t find this apartment interesting at all,” and “This apartment is worth renting/This apartment is not worth renting” (α = .80). In addition, various manipulation and confounding checks as in Experiment 1 were collected: (a) subjective measures of time perspective (α=.97); (b) objective measures of time perspective (α=.85); (c) levels of involvement (α=.86); (d) subjective feelings (α = .90); and, (e) demand checks. Finally, participants reported basic background information including their proximity to graduation in their respective programs of study.

10.2 Results

Ten participants were removed because they either did not complete all the measures or skipped the mood manipulation. Thus, one hundred and four responses were used. All analyses were based on a two-way ANOVA model, with (1, 103) degrees of freedom.

10.2.1 Manipulation and Confounding Checks

When inquired, none of the participants guessed the true purpose of this study. Manipulation of time perspective was successful: both subjective and objective evaluation of time perspectives were more future-oriented in the distant future condition
(M_{subjective\ time}=5.12 \text{ and } M_{objective\ time}=6.36) \text{ than in the near future condition (} M_{subjective\ time}=4.28 \text{ and } M_{objective\ time}=4.17), \text{ revealing a marginally significant main effect of time perspectives on participants' subjective assessment of time perspectives (} F=2.99, p<.09) \text{ and a significant main effect of time perspectives on their objective assessment of time perspectives (} F=20.86, p<.0001). \text{ All the other effects in both models were nonsignificant. In addition, levels of involvement did not differ across conditions (all } Fs<1). \text{ Lastly, main effects of time perspectives and moods on participants' reported levels of moods were nonsignificant but a marginally significant interaction effect of time perspectives and moods was found (} F=2.82, p<.1), \text{ where both simple effects of mood within time perspectives were nonsignificant (} F_{\text{within} \ near-future}<1; F_{\text{within} \ distant-future}=2.17, p<.2).}

10.2.2 Intention to Rent the Apartment and Willingness-to-Pay for Rent

It was predicted that time perspectives closer to the present should increase the reliance on feelings in judgments and decisions. Compared to distant future decisions, near future decisions should promote a greater reliance on feelings as information. Hence, if nearer future perspective encourages the reliance on feelings, evaluations under such perspective should be more likely to be colored by momentary moods, whether happy or sad. Under near future perspective, if participants relied on their feelings as information, they should interpret positive feelings as a sign of liking and satisfaction and negative feelings as a sign of disliking and dissatisfaction. A pronounced mood effect should be found between near future conditions. Under distant future perspective, participants should not rely on
their feelings so the valence of their feelings should not affect their evaluations. In sum, I predict a significant interaction of time perspectives and mood states.

In terms of stated intention to rent the apartment, both main effects of time perspectives \( (F=2.23, p=.14) \) and moods \( (F=1.79, p=.18) \) were nonsignificant. More importantly, a significant interaction effect of time perspective and mood emerged \( (F=5.93, p<.02) \), revealing a pronounced mood effect on stated intention to rent the apartment within the near-future conditions \( (M_{\text{positive}}=5.28 \text{ vs. } M_{\text{negative}}=3.72; F=7.14, p<.01) \) and a nonsignificant mood effect within the distant-future conditions \( (F<1) \). Even though the source of their momentary feelings was incidental, near-future participants interpreted feeling happy as a signal of liking and feeling sad as a signal of disliking the target apartment. Hence, the difference in their momentary feelings influenced near-future participants' stated intention to rent the apartment. In contrast, although distant-future participants experienced similar feelings after watching the same video clips, they did not use their momentary feelings as inputs to their stated intention to rent the apartment.

A similar pattern was uncovered in terms of participants' willingness-to-pay for rent: both main effects of time perspectives and moods were nonsignificant \( (Fs<1) \) but a significant interaction effect emerged \( (F=4.94, p<.03) \), demonstrating a pronounced mood effect between near-future conditions \( (M_{\text{positive}}=$1,916.00 \text{ vs. } M_{\text{negative}}=$1,588.89; F=5.35, p<.03) \) and a nonsignificant mood effect between the distant-future conditions \( (F<1) \). Near-future participants were willing to pay significantly higher rental prices for the apartment when they were feeling happy than sad, presumably interpreting their feelings
as indication of liking or disliking for the apartment. In contrast, distant-future participants were willing to pay about the same rental prices for the apartment whether they were feeling happy or sad. They did not use their feelings as information in their valuation decision for the apartment rental. Further, analysis of participants’ specific evaluation of the target apartment showed that none of the effects in the two-way ANOVA model approached significance (all p’s > .2). This implies that, should there be differences across the conditions in participants’ stated intentions to rent the target apartment, it seems more plausible that this difference would be due to participants’ reliance on different processing routes, rather than because they objectively judged the target apartment differently. Figure 10.1 below summarizes findings of this study.

Figure 10.1. Effect of time perspectives and mood on intention to rent apartment and WTP for rent (Experiment 4).
10.3 Discussion

This experiment provided additional evidence that participants with time perspectives closer to the present were more likely to rely on their moods than did participants with distant time perspectives. It provides further and direct evidence that weighting of feelings and accessibility of feelings are distinct mechanisms in the context of decisions across time. Past research typically posits that consumers are impatient in waiting for a delayed but overall more valued rewards because they experience more intense feelings with present rewards. However, the mechanism of differential accessibility of current vs. delayed feelings cannot predict the interaction effect of time perspectives and incidental moods observed in experiment 3, but would predict only a main effect of incidental mood (i.e., mood congruence effect). Because accessibility of feelings was externally manipulated through mood-inducing videos, feelings should be equally accessible between near future and distant future conditions. For this old explanation to hold, if participants' feelings are equally accessible, they should be comparable in their decisions for apartment rental irrespective of their time perspective. In contrast, the new explanation proposed by this dissertation suggest that even if the accessibility of feelings was comparable across time perspectives, participants should be more likely to use their feelings as inputs to near future (vs. distant future) decisions.

This experiment also extended experiment 1 by using a different source of feelings, those that come from an irrelevant source (i.e., incidental feelings) rather than those that come directly from the decision task (i.e., integral feelings). By manipulating feelings outside
of the main decision task, a shortcoming of the first experiment was addressed. An alternative explanation to experiment 1’s findings is that, rather than the reliance on feelings in the near future, the intensity of feelings associated with the different apartment options changed with time. In experiment 4, intensity of feelings was held constant across time because all participants within each mood conditions saw the same video clips. Because information content was held constant by showing only one apartment, the possibility that content of attributes themselves changed with time perspectives was ruled out. Also note that a possible alternative explanation of time discounting (i.e., a greater disregard for future decisions) seems unlikely because both experiments 1-4 held decision times constant (all decisions are made right now), but varied time perspectives to either near future or distant future through when the consumption will take place.

Because decisions are naturally forward-looking, experiments 1-4 all focused on the effect of prospective time perspectives on consumers’ reliance on feelings as inputs to evaluations and decisions. Recall that the weighting of feelings hypothesis indicates that, as a consequence that the feeling-based, affective system is engaged in the present, feelings are more likely to serve as sources of information in judgment and decisions closer to the present. This implies that, in addition to looking forward in time, past time perspectives should exert an analogous effect on the reliance on feelings in evaluations. Feelings should be more heavily weighted as inputs to evaluations for the more recent past than for the distant past. In the next experiment, I start looking backwards in time and explore a potential parallel effect of past time perspectives.
Chapter 11

Experiment 5: Test for Effect of Retrospective Time Perspectives on Reliance on Incidental Feelings (Retro Video Game Study)

Experiments 1-4 examined the influence of differences in future time perspectives on reliance on feelings in judgments and decisions. Recall the general proposition of this dissertation that present versus distant time perspectives encourage a differential engagement of the affective system, in the current experiment, I test the possibility of a systematic effect of past time perspective on the reliance on feelings. If the effect of time perspective lies in whether it is perceived as close to or distant from the present time, then a differential engagement of the affective, feeling-based system should be found between recent past and distant past perspectives. In particular, there should be a greater engagement of the affective system in the recent past.

The basic setup of this study is similar to that of experiment 4. First, participants' incidental feelings were manipulated through mood-inducing videos. Then participants were given an ostensibly unrelated second study in which their past time perspectives were varied and then they were asked to evaluate a set of stimuli. If recent past perspective promotes a greater reliance on feelings as inputs to judgments and decisions, then such evaluations should demonstrate significant incidental mood effects. However, if distant past perspective discourages the use of feelings as inputs to judgments and decisions, then participants should not rely on, or may even discount, their momentary feelings in their evaluations. In short, an interaction effect of time perspective and
incidental mood is predicted, with a relatively more pronounced effect of mood in the recent past than in the distant past.

11.1 Method

11.1.1 Participants and Design

One-hundred-and-three students from Columbia University (50 male and 53 female, average 22.91 years old) who were each paid $5 were randomly assigned to one of 4 conditions of a 2 (mood: positive vs. negative) x 2 (past time-perspective: recent past vs. distant past) between-subjects design.

11.1.2 Procedure, Stimuli, and Measures

This experiment was administered as two supposedly unrelated studies on the computer. In the first study, participant’s mood was manipulated using the same procedure as in Avnet and Pham (2007) described earlier in Chapter 10. In the supposedly unrelated second study, participants were given the cover story that this study was to understand how people evaluate various media from the past.

Participants were first told that the study is to understand how people evaluate various mini-games as well as their reactions toward these media. Specifically, they were told that the study was interested in consumer’s evaluations of a team of video game designers based on a selection of mini-games (also known as casual games) they have developed in the past. To vary different past time perspectives, participants were randomly told that these games were created, developed, and released either recently since 2007 (recent past)
or in the early 1980s (distant past), and were encouraged to imagine themselves playing these mini-games. All participants were shown the same three video games that were actually produced: Pong, Combat, and Duck Hunt. Each game was illustrated by a screenshot and a brief description of the game. To reinforce different time perspectives, game screenshots and debut dates were varied between the two past time horizons with crisper images and more recent release dates for the games (see Appendix F for the actual stimuli used).

After they viewed information of these three games, participants were asked to evaluate this team of video game designers who developed this selection of games in the past, based on the video game standards and to comparable mini-games available at the time. Their evaluations were assessed by six seven-point scales, anchored by “These games are good/These games are not good” (reverse-coded), “I find the games uninteresting/I find the games interesting,” “I like the games they developed/I do not like the games they developed” (reverse-coded), “These games look addicting/These games look boring” (reverse-coded), “The games look innovative for their time/The games look outdated for their time” (reverse-coded), “I have an unfavorable opinion of the games this team develop/I have a favorable opinion of the games this team develop” (α = .92).

Participants were also asked to express their specific assessments of the overall quality of the mini-games, taking into account the video game technology of the time, on three seven-point scales anchored by “These are high quality games for their era/These are low quality games for their era” (reverse-coded), “These games were not professionally made for their time/These games were professionally made for their time,” and “These games
look as if a lot of thought went into their creation/These games look as if not much thought went into their creation” (reverse-coded; $\alpha = .85$).

Additional manipulation, confounding, and demand checks were collected: (a) their levels of involvement on four agree-disagree items “I did not take the task of evaluating the various types of media very seriously,” “I looked at the pictures of mini-games very carefully” (reverse-coded), “I found the task of evaluating these games very interesting” (reverse-coded), “I took extra care in evaluating my attitudes toward these media” (reverse-scored; $\alpha = .79$); (b) their feelings after watching the video clips on five seven-point items by “bad/good,” “pleasant/unpleasant” (reverse-coded), “frustrated/comfortable,” “unhappy/happy,” and “cheerful/sad” (reverse-coded; $\alpha = .94$); and, (c) guess of the purpose of the study. Lastly, participants reported some background information including how many hours they spend playing video games in a typical week, approximately how many years they have been playing video games, whether they recognized any of the games shown in the study, gender, and age.

11.2 Results

Data from three participants were discarded from all analyses because they did not watch the mood-inducing videos. Additionally, two participants suspected the relationship between the two ostensibly unrelated studies. Although they did not know the true purpose of the study until end of the lab sessions and their responses did not change the pattern or significance of the results, their data were nevertheless discarded from all subsequent analyses to enhance the validity of results. Hence, all subsequent analyses
were based on data from 98 participants in a two-way ANOVA model, with (1, 94) degrees of freedom.

11.2.1 Preliminary Checks and Analyses
On average, participants indicated that they spend about 2.24 hours per week playing video games and have been playing video games for 8.53 years. Most of the participants (70%) indicated that they recognized at least one of the target games, and preliminary analyses demonstrated that participants have more favorable attitudes toward the games when they recognize these games ($M_{yes}$=4.59 vs. $M_{no}$=3.41; $t(97)$=3.48, $p<.001$). In addition, age and gender significantly influenced participants’ evaluations of the games. Not totally surprisingly, younger participants gave higher evaluations to the games than did older participants ($\beta=-.16; t(97)=-4.00, p<.0001$), and men evaluated the games more positively than did women ($M_{men}$=4.66 vs. $M_{women}$=3.82; $F=6.87, p<.02$).

The effectiveness of the mood manipulation clips was verified. A significant main effect of mood emerged in the 2x2 ANOVA model on participants’ self-reported mood ($F=32.83, p<.0001$), showing that participants in the positive mood conditions were feeling more pleasant ($M=5.05$) than those in the negative mood conditions ($M=3.52$). Other effects in the same ANOVA model remained non-significant (both $p's>.22$). In addition, participants’ level of involvement in the study did not differ across the conditions as none of the effects in the 2 (time perspectives) x 2 (moods) ANOVA model approached significance (all $p's>.16$).
11.2.2 Overall Evaluation of Video Games

As a consequence of the affective, feeling-based system being more likely to be engaged in the present, it was hypothesized that time perspectives closer to the present would increase the reliance on feelings in judgments and decisions. I therefore predicted a significant interaction effect of time perspective and mood on participants’ subjective evaluation of the video games, with a more pronounced influence of mood under a recent past perspective than under a distant past perspective.

Results showed a significant main effect of time perspective (F=47.19, p<.0001), in which participants gave higher evaluations for games when they were led to think of these games as created in the early 1980s (distant past) than when they were told these games were developed since 2007 (recent past; M_{distant\ past} =5.14 vs. M_{recent\ past}=3.34). The difference was likely to be driven by expectation of more advanced technology and higher standards of video games overtime. Results also uncovered a significant main effect of momentary moods (F=9.18, p<.01): participants gave higher evaluations under positive moods (M=4.65) than negative moods (M=3.83). This result is consistent with past findings on mood congruency. More central to my thesis, these significant main effects were qualified by a significant interaction effect of time perspective and incidental mood on participants’ overall evaluation of the three video games (F=4.21, p<.05). Under a recent-past perspective, participants gave significantly higher evaluations of the games when they were feeling happy than sad (M_{happy}=4.01 vs. M_{sad}=2.70; F=12.91, p<.0005), suggesting that they relied on their momentary feelings as a source of information in their evaluations. Although the sources of their feelings were explicitly
varied from unrelated video clips they watched in an earlier task, participants who were
prompted a recent time perspective interpreted feeling happy as an indication of liking
and favorable evaluation of the target games and feeling sad as a signal of disliking and
unfavorable evaluation of the games. In contrast, under a distant past perspective,
participants gave comparable ratings to the games irrespective of their moods
(M_{happy}=5.26 vs. M_{sad}=5.00; F<1), suggesting that they did not incorporate these feelings
into evaluations of the games. This pattern of results occurred despite participants under
a distant past perspective experiencing similar feelings from watching the same mood-
inducing clips as participants under a recent past perspective. Hence, results support the
hypothesis that consumers place greater weight on using their feelings as inputs to
making evaluations and decisions under a time perspective closer to the present (vs.
distant time). See Figure 11.1 for a summary of the results.

Figure 11.1. Effect of past time perspectives and moods on overall game evaluations
(Experiment 5).
11.2.2 Specific Evaluation of the Quality of Video Games

In the earlier section, results showed a significant interaction effect of time perspective and mood on participants' reliance on incidental feelings, with pronounced influence of momentary feelings found only under a recent past perspective. To further assess that this pattern of results is due to participants' reliance on feelings (as a holistic process) under recent past perspective per se, rather than a change in their specific evaluation criteria across time, participants' specific evaluation of the quality of video games was analyzed. Results of a 2 (time perspective) x 2 (mood) ANOVA demonstrated a significant main effect of time perspective (F=108.14, p<.0001) in which participants rated the games made in the early 1980s (distant past) as of much higher quality compared to mini-games made in the same time period than they rated the same games made since 2007. This also corresponds to the earlier notion that participants may expect game technology to improve over time, therefore evaluating the three mini-games as of higher quality, taking into account technology of video games in the same time period, when they were told that the games were developed in the distant past than in the recent past. The other effects in the model remained nonsignificant (p's>.19). Hence, it was probably the differential weighting of feelings for inputs to evaluations between time perspectives, rather than changes in the objective criteria in evaluation or evaluative content, that lead to the interaction effect of time perspectives and mood on participants' evaluation of video games. Mood manipulation only altered participants' summary evaluations in the recent past conditions, without changing evaluative content of the games. That is, even though participants under recent past perspective evaluated the games depending on their momentary feelings, their specific assessment of the quality of
the games were comparable. This is consistent with previous results indicating that affective responses are perceived to be more informative of general evaluations than of more specific attribute evaluations (Pham 2004; Pham 1998). This result on participants’ specific evaluation of the quality of video games is displayed in Figure 11.2.

Figure 11.2. Effect of past time perspectives and moods on specific evaluations of game quality (Experiment 5).

**Evaluation of the Quality of Video Games**

- Positive mood
- Negative mood

<table>
<thead>
<tr>
<th>Time Perspectives</th>
<th>Positive Mood</th>
<th>Negative Mood</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recent Past</td>
<td>3.24</td>
<td>2.69</td>
</tr>
<tr>
<td>Distant Past</td>
<td>5.57</td>
<td>5.47</td>
</tr>
</tbody>
</table>

11.3 Alternative Explanation of a Ceiling Effect

One possible alternative explanation to this experiment is that the absence of mood effect in the distant past conditions may be due to a ceiling effect. It is possible that games developed in the distant past may already have such a high baseline evaluation, because game technology was more rudimentary in the early 1980s, that no additional mood effect could be detected. But looking at the structure of the data, ceiling effect seems like an unlikely alternative explanation because both distant past conditions were normally-
distributed and this alternative account should suggest negatively-skewed distributions for these conditions. To further assess the possibility of this alternative explanation of ceiling effect, I reanalyzed the data through the method of successive intervals which is largely invariant to floor and ceiling effects (Schwarz et al. 1987). Method of this analysis was primarily based on procedures described in Edwards and Thurstone (1952). Seven-point response scales used in the experiment were thus transformed to five-point ordinal scales after adjusting for category-widths of the response scales, then adjusted back to seven-point scales using least square estimates of the scale values. Reanalyzing the transformed data for evaluation of games with likelihood ratio tests showed the same pattern of results as the analyses on untransformed data. Notably, simple effects of mood within distant past conditions remained nonsignificant (p=.57). Therefore, the lack of mood effects in the distant past conditions cannot be explained by a possible ceiling effect.

Another way to rule out this alternative explanation of ceiling effect is to directly control for the possible differences in baseline evaluations of games made at different times. Thus, an additional analysis was conducted using specific evaluation of game quality as a covariate to the 2 (mood) x 2 (time perspective) model\(^9\). Unlike the original ANOVA, results of ANCOVA illustrated a nonsignificant effect of time perspective (F<1). This finding is expected as the ANCOVA partials out difference in baseline evaluations of games made at different times. But, similar to the original analysis, results of ANCOVA

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\(^9\) This covariate, “specific evaluation of game quality,” satisfies the homogeneity of regression coefficients assumption and is thus valid for this analysis.
showed a significant main effect of mood (F=7.73, p<.01) in which participants evaluated the games more positively under a positive mood (M=4.53) than under a negative mood (M=3.96). Results also revealed, more importantly, an almost significant interaction effect of mood and time perspective (F=3.54, p=.06) in the predicted directions. Participants in the recent-past conditions gave significantly higher evaluations under a positive mood than under a negative mood (F=10.75, p<.01; M_{happy}=4.66 vs. M_{sad}=3.70), but participants in the distant-past conditions gave comparable evaluations regardless of their momentary moods (F<1; M_{happy}=4.40 vs. M_{sad}=4.21). This again demonstrated nonsignificant simple effects of mood within distant past conditions (p=.52), even after having controlled for the possible differences in baseline evaluation of games across time. In short, results of ANCOVA also suggested that the alternative explanation of ceiling effect cannot account for the nonsignificant simple effect of mood in distant past. Participants were more likely to rely on their momentary feelings in their evaluations for games under a recent past perspective than under a distant past perspective.

11.4 Discussion

Whereas earlier experiments focused on the influence of prospective time horizons, this experiment looks at the effect of past time perspectives on the reliance on incidental feelings in judgments and decisions. Findings document a significant interaction between past time perspectives and incidental moods, in which participants exhibited greater reliance on momentary feelings in their evaluations for video games when they were prompted to adapt a recent past perspective than when they were prompted to adapt a distant past perspective. The parallel mood effects found for recent pasts and near futures
(compared to distant pasts or distant futures) support the hypothesis that consumers make greater reliance on their feelings for decisions close to the present. They do so whether they are looking forward or backward in time.

This finding also documents the unique phenomenological property of feelings in the here and now. Consumers are more attuned to their internal feelings in the present time, not only because they typically experience more intense feelings in the present, but also because they tend to rely more on these feelings as diagnostic information. As in experiment 3, in this experiment the intensity of subjective feelings was held constant across time perspectives by explicitly manipulating feelings through mood-inducing clips outside of the main evaluation task. It provides further evidence that the differential weighting of feelings across time perspectives provides a distinct and additional explanation for consumers' short-sightedness in consumption decisions across time. This explanation is distinct from the differential accessibility of feelings mechanism posited by past literature (Blischke et al. 1975; Edwards and Thurstone 1952; Jones 1959; Jones 1960). An accessibility of feelings explanation would not predict the interaction effect of time perspectives and incidental moods, but would rather posit only a main effect of incidental mood. According to that explanation, participants across time horizons should not differ in their evaluations if the accessibility of their feelings was held constant. In contrast, the new explanation proposed by this dissertation suggest that even if the accessibility of feelings was comparable across time perspectives, participants prompted
to a recent past or near future perspective would be more likely to use their feelings as information for evaluations than participants under a distant time perspective.

In addition to using a manipulation of past time perspective, this experiment extended earlier experiments by applying a different product domain. Using different primes for time perspectives (past, future) and moods (integral, incidental) in decisions for apartment rentals and video games, experiments 1-4 collectively showed that participants relied more on their feelings when they were prompted time perspectives closer to the present—whether they were anticipating the near future or looking back in recent past. As noted in the earlier section, one plausible alternative explanation is the possibility that contents of stimulus material used to manipulate time perspectives may have introduced additional confounds. The next experiment directly addresses this issue.
Chapter 12

Experiment 6: Test for Retrospective Evaluation and a Reliance on Incidental Feelings (Spring Break Memory Study)

This experiment tested the effect of time perspective on the reliance on incidental feelings in the context of past experiences. The primary objectives of this experiment were (a) to replicate experiment 5 findings and demonstrate a relatively greater weighting of incidental feelings under a recent past perspective than under a distant past perspective, and (b) to use a different prime for past time perspective. Whereas experiment 5 manipulated time perspectives through stimulus materials, this experiment varied time perspectives by asking participants to recall personal experiences that occurred at different points in time.

Specifically, Participants were put into either a recent past or a distant past perspective by recalling their spring break experiences from different times. Their incidental feelings were manipulated during an ostensibly distracter task before they evaluated the recalled spring break. It was predicted that a more recent past perspective increases the reliance on incidental feelings. Therefore, participants primed with a recent past perspective should exhibit a relatively greater influence of momentary mood in their evaluations of past vacations than participants primed with a distant past perspective.
12.1 Method

12.1.1 Participants and Design

Eighty-two students at Columbia University (48.78% male, average 24.29 years old) were recruited for this experiment. They were each paid $8 and were randomly assigned to one of 4 conditions of a 2 (mood: positive vs. negative) x 2 (past time-perspective: recent past vs. distant past) between-subjects design.

12.1.2 Procedure and Measures

Participants were seated at individual computer stations upon entering the lab. They were given a cover story that the spring break memory study was to understand how well people remember significant events in their lives and their abilities to recall such events. As mentioned earlier, this experiment used an alternative manipulation of past time perspective than experiment 5. Rather than priming past time perspectives through stimulus materials, participants were asked to recall and write about their own spring break vacations. Half of the participants were randomly asked to recall their spring break vacation that happened a few weeks ago (recent past) and the other half of the participants were asked to recall their spring break vacation that happened two years ago (distant past). After recalling their past spring break vacation, participants were instructed to write about it in 130-180 words\(^\text{10}\) and report the number of words after they finished writing. Restricting the length of recall was intended to help justify the cover story and equate the accessibility of recall across time perspectives. Participants were

\(^{10}\) It was pretested that students can easily write about their recent and past vacations between 130 and 180 words.
asked some questions about the recalled event to increase the credibility of the cover story.

Next, participants were told that to better understand how well they could put themselves back into the past, they would be given a distracter task and asked to complete an unrelated questionnaire. This distracter task was actually the mood manipulation, disguised as a movie rating study. It was the same procedure as in Avnet and Pham (2007) described in Chapter 10 and used in Experiment 4 and 5. Participants were randomly assigned to watch either the happy or the sad clip.

After their momentary moods were varied, participants were given a second part of the spring break memory study. To test whether they rely on their feelings in making evaluative judgments differently across time, participants were asked to report their overall evaluation of the recalled spring break. This overall evaluation of the spring break served as the main dependent measure of the experiment. It consisted of seven 7-point items anchored at “I did not have a good time/ I had a good time,” “I didn’t find this vacation interesting at all/ I found this vacation very interesting,” “It was disappointing/ It was gratifying,” “Overall it was a very bad vacation/ Overall it was a very good vacation,” “I would not do it again/ I would do it again,” “I did not enjoy this spring break vacation at all/ I really enjoyed this spring break vacation,” and “It was not fun/ It was a lot of fun” ($\alpha=.97$).
Several additional checks for time perspective, mood, involvement, and demand were collected. To confirm that participants had different time perspectives, they were asked to report whether they thought about the situation as something that happened recently or a long time ago. This measure, a subjective assessment of time perspective, was tested by three 7-point items anchored at "the very recent past/the very distant past," "feels very close/feels very distant," and "just happened/long time ago" (α=.93). To check the effectiveness of mood manipulation, participants were also asked to report their feelings after watching the affectively-charged videos on five 7-point items by "bad/good," "pleasant/unpleasant" (reverse-coded), "frustrated/comfortable," "unhappy/happy," and "cheerful/sad" (reverse-coded; α = .97). Level of involvement in the experiment was measured by two 7-point agree-disagree items: "I tried as hard as I can to recall the details of my past spring break vacation" and "I thought about my past spring vacation very carefully" (α=.77). Demand checks were also collected. At the end of the experiment, participants reported basic demographic information.

12.2 Results

All analyses were based on a two-way ANOVA model, with (1, 76) degrees of freedom, unless noted otherwise.

12.2.1 Preliminary Checks

A first manipulation check item tested the effectiveness of self-reported recalls of past spring break in manipulating time perspectives. Results showed a significant main effect
of time perspective on participants’ subjective assessment of time (F=6.18, p<.05), confirming that subjective evaluation of time was more past-oriented in the distant past condition (M=4.36) than in the recent past condition (M=3.31). Participants who recalled a spring break that happened just a few weeks ago thought of their experience as one that occurred more recently than participants who recalled a spring break that happened two years ago did. A significant main effect of mood also emerged on participants’ subjective reports of time (F=5.40, p<.05), in which a more positive mood made the recalled spring break seemed more recent (M_{happy}=3.34 vs. M_{sad}=4.33). The interaction effect of time perspective and incidental mood remained nonsignificant (F<1).

A second manipulation check item tested the effectiveness of mood manipulation. Replicating findings from experiment 4 and 5, a significant main effect of mood was found (F=90.27, p<.0001). Participants felt more pleasant after watching the happy video than they felt after watching the sad video (M_{happy}=5.38 vs. M_{sad}=2.57). Other effects in the model remained nonsignificant (p’s>.11). In short, both manipulations of past time perspective and incidental mood were successful. Lastly, level of involvement in the study was assessed. Results revealed that none of the effects in the 2 (time perspectives) x 2 (moods) ANOVA model approached significance (all p’s>.14).

### 12.2.2 Summary Evaluation of Past Spring Break

Because memory of past vacation was likely to be itself affectively-charged, this may have introduced an extra source of variability which confounded with the incidental mood manipulation. Participants’ evaluations of past spring breaks may have started at
different baseline values, making it more difficult to detect possible effects of time perspectives and incidental moods. Two independent coders who were blind to the experimental hypothesis rated participants' descriptions of past spring break. Content analysis revealed that these descriptions fell into one of three categories: (a) they went somewhere for spring break (59.03%), (b) they didn't go anywhere for spring break (26.51%), and (c) they worked or interned during spring break (14.46%; inter-rater reliability=95%, disagreement resolved by a third independent rater). This new categorical measure was a significant predictor of participants' overall evaluation of spring break (F(2,80)=14.40, p<.0001). Thus, two dummy variables were created to control for the extraneous source of variability, indicating (a) whether participants went on vacation during spring break, and (b) whether participants worked or interned or not. In sum, participants' overall evaluation of past spring break was submitted to a 2 (time perspective) x 2 (incidental mood) ANCOVA with two dummy covariates. Following experiments 4 and 5, it was predicted that a significant interaction effect of time perspective and mood on participants' overall evaluation of their past spring break vacation would emerge. Specifically, this interaction effect would be driven by a more pronounced effect of mood under a recent past perspective than under a distant past perspective.

Results from ANCOVA revealed that both main effects of time perspective and incidental mood remained nonsignificant in predicting participants' overall evaluation of past spring break (p's>.23). Verifying the main predictions of this experiment, a

11 Both covariates satisfied the homogeneity of regression coefficients assumption and were valid for the analysis of covariance.
significant interaction effect of these two factors was uncovered ($F=4.21, p<.05$)\textsuperscript{12}. Under a recent past perspective, participants rated their past spring break vacation as significantly more positive when they were feeling happy at the time of evaluation than when they were feeling sad at the time of evaluation ($M_{\text{happy}}=5.87$ vs. $M_{\text{sad}}=4.78$; $F=4.28$, $p<.05$). These recent-past participants relied on their momentary feelings as a source of information in making evaluations. Although the sources of their feelings were explicitly varied through unrelated videos they watched during the distracter task, participants who were primed with a recent time perspective interpreted feeling happy as an indication of an overall pleasant spring break experience and feeling sad as an indication of an overall unpleasant spring break experience. In contrast, under a distant past perspective, participants' momentary moods did not affect their ratings of overall spring break vacation ($M_{\text{happy}}=4.72$ vs. $M_{\text{sad}}=5.03$; $F<1$). This result demonstrates that participant in the distant past conditions did not incorporate their momentary feelings into their overall evaluation of past spring break. Note that this pattern of results occurred even though participants across time perspectives experienced similar feelings from watching the same affectively-charged videos. Hence, these results support the weighting of feelings hypothesis that participants place greater weight on using their feelings as inputs to making evaluations and decisions under a time perspective closer to the present (vs. distant time). These results are summarized in Figure 12.1.

\textsuperscript{12} Additional analysis treating this covariate (recalled experience: "went on vacation", "didn't go on vacation", "worked or interned") as a blocking factor revealed similar results as ANCOVA.
Experiment 6 illustrated a significant interaction between past time perspectives and incidental moods. Results of this experiment support the prediction that recent past perspective increases the reliance on feelings on evaluations of personal past events. Participants exhibited greater reliance on current, momentary feelings in evaluations of recent past vacation than in evaluations of distant past vacation. Although memory of past experience was likely to be itself affectively-charged, experiment 6 suggests that momentary feelings may additionally color people's memory—especially memory of recent past events. This experiment replicated experiment 5 findings using a different manipulation of past time perspective in demonstrating a greater weighting of affective information in the more recent past. Asking participants to report a personal experience that occurred at different points in time reduced the chance of confounding with the content of the stimulus materials, which may be a concern in experiment 5. In short, this
experiment uncovered a systematic mechanism that guides memory for past experiences and identified a potential moderator for the memory bias. It is interesting to note that more recent memories were more likely to be affected by unrelated, momentary feelings, even though memories of a recent past spring break tend to be more accessible than memories of a distant past spring break. Participants seemed to use their current feelings as a source of information differentially to inform their recollection of past events, depending on the time perspective they adopted. This notion relates to previous work on mood dependent memory (Loewenstein 1996) which suggests that past events encoded in a certain mood are most retrievable in that mood, irrespective of the events’ actual valence. Experiment 6 also relates to Eich’s (e.g., Eich 1995; Eich and Macaulay 2000) finding that participants seemed to perceive their experimentally-induced moods to be highly authentic in thinking about past events, and further demonstrates that this is more likely to occur when recalling certain past events. This experiment showed preliminary evidence that one’s current state of affect or mood may taint recollections of past events, especially when these events were perceived to be subjectively close in time. Additional work providing more details on the underlying process may be worthy of future research. In the next experiment, I demonstrate a consequence of the differential engagement of the affective system across time and provide an alternative, albeit indirect, test of the general proposition that affective system is activated by present time perspectives.
Chapter 13

Experiment 7: Test for Prospective Time Perspectives and the Scope-Insensitivity Bias (Saving Pandas by Picture)

Earlier experiments focused on the effect of time perspectives on the reliance on feelings in judgments and decisions. Participants were found to exhibit greater reliance on both integral and incidental feelings when they were prompted a time perspective close to the present—whether it was about the recent past or the near future—than when they were prompted a distant time perspective. This is presumably because of the greater engagement of the affective system in the present. In this experiment, I examine a different facet of the differential engagement of the affective system across time perspectives. A distinct property of the affect-based system of valuation is that it is relatively scope-insensitive (1995). That is, when consumers rely on feelings in assessing value, they are relatively less likely to take into account quantitative information such as magnitude or scope of the product (e.g., the number of CDs in a bundle) in their subjective valuation of this product (Hsee and Rottenstreich 2004). In this experiment I inferred the activation of the affective system through this scope insensitivity bias. This bias provides an indirect approach to assess the prediction that different time perspectives may activate different types of valuation process, either affect-based or reason-based. I used a variation of the saving pandas study in Hsee and Rottenstreich (2004; study 3). The basic setup of the study is similar to that in the original study: Participants were asked to imagine that a team of zoology students had discovered a number of pandas in a remote region in Asia, and was soliciting donations from students to save these
endangered animals. Unlike in the original study, participants were given an additional manipulation of time perspective. Participants were then asked to indicate how much money they were willing to donate to save the pandas. It is predicted that, if distant-time perspective encourages valuation by deliberate, reason-based calculation, then decisions in the distant-time conditions should yield relative scope-sensitivity to the number of pandas to be saved and multiplying that count by a monetary figure reflecting the donation amount for each panda. On the other hand, if recent-time perspective encourages valuation by feeling, then their decisions should reveal relative scope-insensitivity to the number of pandas to be saved.

13.1 Method
13.1.1 Participants and Design
Fifty-three students from Columbia University (24 males and 29 females, average 22.91 years old) who were each paid $5 were randomly assigned to one of the 4 conditions of a 2 (time-perspective: near future vs. distant future) x 2 (scope size: one panda vs. four pandas) between-subjects design.

13.1.2 Procedure and Measures
Participants were given a variant of the saving panda study in Hsee and Rottenstreich (2004). They were to imagine that a team of zoology students from their university had discovered a number of pandas in a remote Asian region. To manipulate scope, half of the participants were told that one panda was discovered, whereas the other half were told that four pandas were discovered. Unlike in the original study, a time perspective
manipulation was introduced: Participants were told that this region has already been scheduled for major constructions either next month (near future) or in two years (distant future). Refer to Appendix G for manipulation of time perspective and scope used in this experiment. Participants were then asked to indicate the most they would be willing to donate to save the discovered panda(s) from the scheduled constructions by choosing a figure between $0 to $50 comprised in $10-increments ($0, $10,..., $50). Only the affect-rich conditions in Hsee and Rottenstreich’s study was used: All participants saw the same picture of a panda in the table above donation amounts, containing either one picture of the panda or four copies of the same panda picture. Additionally, they were asked to indicate how much money they thought a typical participant in this study considered donating. This measure served as a “cleaner” measure for amount of donations by removing potential budget concerns and social desirability biases.

Several confounding and demand checks were also collected. To check that the intensity of feelings toward panda was comparable across time frames, participants were asked to report their feelings about the panda as they decided how much money to donate for the rescue effort, in five seven-point items anchored at “bad/good,” “unpleasant/pleasant,” “frustrated/comfortable,” “unhappy/happy,” and “sad/cheerful” ($\alpha = .84$). Then, to ensure that participants across conditions were equally involved in the hypothetical situation, they were asked to report their levels of involvement in the study using three seven-point, agree-disagree items: “I went through the possible donation denominations for saving the panda as if I were really contributing to the rescue effort,” “I read through the saving panda scenario very carefully,” and “I find the hypothetical situation of donating money
to save an endangered species very plausible” (α=.68; reverse-scored). Two manipulation checks of time perspectives were also collected. To test their subjective and objective judgments of time frames, participants were asked to report: (a) their assessment of situation as something that would happen very soon or much later by three seven-point items anchored at “the very near future/the very distant future,” “very soon/much later,” and “in a month/in two years” (α=.87); and (b) what time periods were they focusing on as they considered how much money to donate by two items anchored at “next month/two years later” and “the very near future/the very distant future” (α=.89). Lastly, participants were asked to report basic demographic information such as how much they like pandas in general.

13.2 Results

13.2.1 Preliminary Checks and Analyses

All analyses on manipulation and confounding checks were performed using data from 53 participants in a two-way ANOVA model, with (1, 49) degrees of freedom. None of the participants guessed the relation between number of pandas and time perspectives on donation amount to save pandas. Preliminary analysis showed that general liking for pandas significantly increased the amount of money donated to save pandas (β=5.74; t(51)=4.53, p<.0001).

Results on the manipulation of time perspectives established that it was successful, with more future-oriented perspectives in the distant future conditions than in the near future conditions. Specifically, a significant main effect of time perspective on participants’
subjective assessment of the time course in the hypothetical situation was revealed, where participants in the distant-time conditions assessed the situation as something that seemed to happen much later ($M=3.76$) than did participants in the recent-time conditions ($M=2.31; F=16.92, p<.0001$). No other effects in the model approached significance. Similarly, a significant main effect of time perspective on participants’ objective reporting of the time periods in the scenario emerged, where participants in the distant-time conditions reported that the time period in the scenario was closer to two years later ($M=3.44$) and participants in the recent-time conditions indicated that it was closer to next month ($M=2.20; F=7.23, p<.01$). There was no significant main effect of scope size ($F<1$) in the model. But results showed an unexpected, marginally significant interaction effect of time perspective and scope size ($F=3.24, p=.08$), in which both simple effects of scope within time perspectives were nonsignificant ($F_{\text{within near-future}<1}; F_{\text{within distant-future}}=2.46, p>.12$). Therefore, this unexpected interaction cannot fully explain predicted main results of this study. Analysis on participants’ self-reported moods revealed that moods were comparable across conditions as none of the effects in the ANOVA model reached significance (all $Fs<1$). This helps to rule out an alternative explanation of intensity of feelings, which will be discussed in a later section.

Interestingly, an unexpected and significant main effect of scope size on participants’ self-reported levels of involvement emerged. Participants reported higher levels of involvement in the four-panda conditions ($M=5.31$) than in the one-panda conditions ($M=4.73; F=4.15, p<.05$). But, more importantly, there was no main effect of time
perspectives or interaction effect of time perspective and scope size on levels of involvement (both Fs<1).

13.2.2 Amount of Money to Donate for the Rescue Effort

As mentioned earlier, general liking of pandas increased donation amounts to save pandas. This tendency was not surprising, and to control for this extraneous and significant influence on amount of money donated to save pandas, participants’ general liking for pandas was entered as a covariate into the original 2x2 model. A nonsignificant main effect of time perspective (F<1) along with a significant main effect of scope size emerged in the model, with participants in the four-panda conditions willing to donate more to the rescue effort (M=$24.97) than would participants in the one-panda conditions (M=$16.00; F=6.66, p<.02). Central to my hypothesis, a 2x2 ANCOVA model with participants liking of pandas\textsuperscript{13} as a covariate uncovered a significant interaction effect of time perspective and scope size on participants’ donation amounts (F=5.85, p<.02). Participants in the near-future conditions were willing to donate about the same amount of money regardless of the number of pandas that needed to be rescued (M_{one-panda}=$20.14, M_{four-pandas}=$20.84; F<1), exhibiting the expected scope insensitivity bias in affect-based valuation. However, participants in the distant-future conditions demonstrated no such bias: Participants in four-panda condition were willing to donate significantly more money to save these pandas (M=$29.09) than would participants in one-panda condition (M=$11.88; F=11.95, p<.01).

\textsuperscript{13} None of the effects in the time perspective x scope size model was significant in predicting participants’ liking of pandas. Also, their liking of pandas satisfies the homogeneity of regression coefficients assumption and is a valid covariate.
Participants were also asked to indicate the donation amount of a typical respondent of this study, which served to reduce influences of external factors such as budget concerns, personal liking for pandas, and desire to present oneself in positively. A 2 (time perspective) x 2 (scope size) ANOVA on this measure showed an equivalent pattern: both main effects of time perspectives and scope size were nonsignificant (both $p's > .21$) but a significant interaction effect of time perspective and scope size ($F = 4.16; p < .05$) emerged. Participants thought a typical respondent would donate about the same amount regardless of how many pandas to be saved in the near future ($M_{one-panda} = \$21.93$, $M_{four-pandas} = \$18.21$; $F < 1$), but would donate significantly more money to save four pandas than one panda in the distant future ($M_{four-pandas} = \$30.00$ vs. $M_{one-panda} = \$14.29$; $F = 5.12$, $p < .03$).

In sum, the scope insensitivity bias associated with affective valuation was found in the near-future conditions, but not found in the distant-future conditions. These results are summarized in Figure 13.1.

Figure 13.1. Effect of prospective time perspectives and scope size on willingness-to-donate (Experiment 7).
13.2.3 Alternative Explanation

One plausible alternative explanation is that intensity of feelings toward pandas varied across time frames, and subsequently translated into participants’ donation amounts. For instance, it was possible that participants felt more strongly about the pandas when put under a near future perspective than a distant future perspective. To test this possibility, participants’ self-reported mood measures were pooled in a composite measure ($\alpha = .84$) and submitted to a 2x2 ANOVA model. Results showed that none of the effects reached significance (all $F$s $< 1$), indicating that feelings toward panda were not less intense in distant future than in near future. This ruled out the possibility that donation amounts were based on how strongly participants across time perspectives felt about the pandas, and supported the explanation that it was weighting of feelings as inputs across time frames per se that influenced how much money to donate.

13.3 Discussion

Results from experiment 7 demonstrated that when the time perspective is closer to the present, participants were more likely to demonstrate a distinctive characteristic of the affective system in judgments and decisions—scope insensitivity. Participants were willing to donate about the same amount of money to save one panda and four pandas from an impending construction in the near future, but were willing to donate significantly more money to save four pandas than one panda from an impending construction in the distant future. This suggests that nearer future perspective increased the use of feelings as inputs to valuation decisions—in this case the amount of money to donate became contingent on feelings about pandas—and led to a greater disregard for
the more quantitative information (number of pandas to be saved) in the valuation
decision.

This experiment ruled out the alternative explanation that intensity of feelings toward
pandas, rather than use of feeling as inputs to valuation task, varied between time frames,
because time perspective did not influence reported levels of mood. This experiment
provides initial evidence that, not only is there greater reliance on feelings in the present,
the whole way of thinking about the situation was different once the affective system
became engaged. In addition to greater reliance on feelings, a unique characteristic of the
affective, feeling-based system—scope insensitivity—is also more likely to occur in the
present time. However, it was still plausible that unobserved correlates of manipulation
of time perspective lead to the observed patterns of this experiment. For instance, one
plausible alternative explanation is that increasing uncertainty in distant future (relative to
near future) may have led to more careful scrutinizing of information—such as number of
pandas—in the decision task. However, this explanation seems unlikely because time
perspectives did not have an effect on reported levels of involvement. Another possible
confound with manipulation of time perspective is that perhaps participants in near future
based their valuation decisions on factors other than their feelings toward pandas. For
instance, they may reason that not much can be done to save either one panda or four
pandas when the impending construction occurs in only a month. In the next experiment,
I address the possibility of unobserved correlates introduced with manipulation of time
frames and examine a boundary condition of time perspective on the scope-insensitivity
bias.
Chapter 14

Experiment 8: Prospective Time Perspectives and the Scope-Insensitivity Bias

(Saving Pandas by Dots)

The primary objective in this experiment was two-folds: (a) to ensure that results obtained in the previous experiment were not due to some extraneous influences related to the introduction of time perspective manipulation, and (b) to examine situations where affective information was removed. Experiment 7 focused on the effect of different time perspectives using affect-rich stimuli. The affective intensity of the stimulus presentation was held constant and assumed to be rather enriching, because participants in all conditions were shown cute pictures of panda. Results from experiment 7 suggested that participants selectively relied on their feelings, depending on the time perspectives they adopted. But what happens if affective information was not available in the context of the decision? In this experiment, I explored a possible boundary condition of the relation between time perspectives and the scope-insensitivity bias: the availability of affective information as input to judgment. The logic is straightforward: Although the affective system is more likely to be engaged in the present, participants could only use their feelings as input to judgment when this piece of information becomes available to them.

The basic setup of experiment 8 closely resembled that of the previous experiment. But unlike experiment 7, affect intensity of the presentation was greatly reduced in the current experiment because pandas were depicted by large black dots. In other words, affective information was removed as basis for judgment in the present experiment. It was predicted that participants would donate more money to save four pandas than one panda,
irrespective of the time perspective manipulation introduced. Participants across both
time perspective conditions should yield scope-sensitivity.

14.1 Design and Method

The setup of this experiment was identical to Experiment 7, except one important
difference: only the affect-poor (large dots) conditions were adopted.

14.1.1 Subjects and Design

Sixty-three students (25 men and 38 women) at Columbia University who provided
complete responses were randomly assigned to one of four conditions of a 2 (time
perspective: near-future vs. distant future) by 2 (scope size: one panda vs. four pandas)
between-subjects design. They were each paid $5 for their participation.

14.1.2 Procedures

As in Experiment 7, participants were given a modified version of the saving pandas
study in Hsee and Rottenstreich (2004). They were asked to imagine that either one
panda or four pandas were discovered by a team of volunteers from their university.
Unlike the previous experiment, only the affect-poor conditions in Hsee and
Rottenstreich’s (2004) original study were used, where each panda was depicted by a
large dot. In other words, participants saw either one or four large dots. A time
perspective manipulation was again introduced as participants were told a hypothetical
construction would take place either next month (near future) or in two years (distant
They were then asked to indicate the most amount of money they would be willing to donate to save the discovered panda(s) from the scheduled construction, by choosing the closest figure between $0 to $50 (in $10-increments). Then, they were asked to indicate how much money they think a typical participant in this study considered donating. These two measures formed the main dependent measures of this experiment.

Several confounding, manipulation, and demand checks which were the same as in experiment 7 were collected. Participants were asked to report their feeling about pandas when deciding how much money to donate in five seven-point items by “bad/good,” “unpleasant/pleasant,” “frustrated/comfortable,” “unhappy/happy,” and “sad/cheerful” (α = .88). They were also asked to indicate their levels of involvement in the decision task in three seven-point, agree-disagree items: “I went through the possible donation denominations for saving the panda as if I were really contributing to the rescue effort,” “I read through the saving panda scenario very carefully,” and “I find the hypothetical situation of donating money to save an endangered species very plausible” (α = .61; reverse-scored). To check that time frame of the impending construction affected their subjective and objective evaluation of time perspectives, two measures of time perspectives were collected. Participants were asked to indicate: (a) their subjective assessment of time perspective by three seven-point items anchored at “the very near future/the very distant future,” “very soon/much later,” and “in a month/in two years” (α = .92); and (b) what time periods were they focusing on as they considered how much money to donate by two items anchored at “next month/two years later” and “the very
near future/the very distant future” (α = .94). Lastly, participants were asked to report basic demographic information such as how much they like pandas in general.

14.2 Results

All analyses were based on a 2 (time perspectives) x 2 (scope size) ANOVA model with (1, 59) degrees of freedom.

14.2.1 Manipulation and Confounding Checks

From the demand check collected, none of the participants guessed the purpose of this study. Time perspectives manipulation was successful. Analyses for both time perspective manipulation checks yielded significant main effects of time perspectives. Participants in the distant future conditions evaluated the situation as something that seemed to happen much later (M=4.19; F=17.50, p<.0001) and focused on time periods closer to two years later (M=3.85; F=11.70, p<.01) than did participants in the near future conditions (M=2.60 and M=2.41, respectively). No other effects in either models approached significance (all Fs<1). In short, the time perspective manipulation introduced in the scenarios worked well. To ensure that manipulations of time perspective and scope size did not have extraneous influences on participants’ mood or involvement in the study, two composite measures were formed based on participants’ self-reports. Results revealed that participants across conditions were comparable in their mood and levels of involvement, as none of the effects approached significance in the
model on participants’ self-reported moods (all ps>.1) or on participants’ self-reported levels of involvement (all Fs<1).

14.2.2 Willingness-to-Donate to Save Endangered Species

It was predicted that, when affective content of the target stimulus was greatly reduced, near future participants would not have the affective information available as basis for making valuation judgments. Therefore, they would not valuate based on their feelings and their valuation pattern would be comparable to that of distant future participants. In other words, it was predicted that there should be no difference in how participants valuate across time.

Central to my predictions, a significant main effect of scope size emerged in the model, with participants in the four-panda conditions willing to donate more to the rescue effort (M=$20.31) than would participants in the one-panda conditions (M=$13.87; F=4.06, p<.05). Main effect of time perspectives was nonsignificant (F<1). Importantly, in contrast to Experiment 7, results showed a nonsignificant interaction effect of time perspective and scope size on participants’ donation amounts (F<1). This suggests that, when affective information was not available for judgment, participants in both the near-future and distant-future conditions were sensitive to the more quantitative scope information. This also ruled out an alternative explanation from the last experiment that unobserved correlates of time perspective may have lead to neglect for scope in the near future.
A similar pattern of findings was found when participants were asked to assess the donation amount of a typical respondent of this study. This measure again served as a "cleaner" measure, reducing extraneous influences on participants' donation amounts due to personal considerations (e.g., personal budget constraints, positive self-presentation, etc.). Results uncovered a significant main effect of scope size: Participants thought their peers would donate significantly more money to save four pandas (M=$19.41) than one panda (M=$12.34; F=6.23, p<.02), irrespective of when the impending construction would occur. All other effects in the model were nonsignificant (both F's<1).

Figure 14.1. Effect of prospective time perspectives and scope size on willingness-to-donate (Experiment 8).

14.3 Discussions
Together with Experiment 7, results from this experiment provided additional support for my main hypothesis that the affective system is engaged in the present. As demonstrated in Experiment 7, a characteristic of the affective system in judgment and decision
making—the scope-insensitivity bias—emerged when participants were prompted a time perspective close to the present. However, the current experiment suggested that this bias occurs in the present only when affective information was readily available. When participants were given cute pictures of panda, their valuation yielded scope-insensitivity (experiment 7); but when given dots, their valuation yielded scope-sensitivity (experiment 8). In the latter case, although their affective system became engaged under a time perspective close to the present, participants did not have the affective information available as input for judgment. These results replicated findings from the original Hsee and Rottenstreich’s (2004) saving panda study. In contrast, because the affective system is not engaged under a distant time perspective, participants exhibited sensitivity to scope or magnitude information whether the stimulus presentation engendered high affect intensity (cute panda pictures) or low affect intensity (dots).

This experiment also ruled out a plausible alternative explanation from experiment 7 that the manipulation of time perspective may have extraneous, unintended influences that lead to the observed results. For instance, one argument may be that participants in the near future conditions donated about the same amount of money to save one or four pandas because too little time is left to be able to save the panda(s) from the impending construction. Experiment 7-8 thus far examined the effect of future orientation on the scope insensitivity bias. The next experiment extends these findings by looking backwards in time.
Chapter 15

Experiment 9: Retrospective Time Perspectives and the Scope-Insensitivity Bias

(Music CD-Bundle)

The first three experiments examined prospective decision horizons. The purpose of this experiment was twofold: (a) to examine the scope insensitivity bias under past time perspectives, and (b) to extend findings into another consumption domain, using a separate, more subtle manipulation for time perspective. As in experiment 7-8, this experiment inferred activation of the affective system through the scope insensitivity bias in the context of music CDs. This product category served as useful decision context for the purpose of this experiment for three reasons. First, music CDs are inherently an affect-rich product category. Second, people typically have comparable reference prices for how much a music CD should cost, which is especially helpful in testing their sensitivity towards the number of CDs in a bundle through their overall valuation amount. Lastly, this product category is interesting and relevant to consumers.

This experiment was administered as two allegedly unrelated studies. Respondents recruited after various college graduation events were first primed to adopt either a distant-past or a recent-past time perspective, and then were given a hypothetical scenario asking their willingness-to-pay for a CD-bundle containing either five or ten music CDs. It was predicted that participants who were promoted a recent past perspective would be less sensitive to the number of CDs contained in the bundles and pay comparable amount of money, whereas participants who were prompted a distant past perspective would yield relative scope-sensitivity in their valuations for bundles containing different number
of CDs. Such a result would suggest that reliance on feelings applies to retrospective
time perspectives as well as prospective time perspectives.

15.1 Method

15.1.1 Participants and Design

One hundred twenty-one respondents (graduates, their families, and friends) were
recruited after various college graduation events in New York City (56 males and 58
females, on average 32.06 years old), and were randomly assigned to one of the 4
conditions of a 2 (time-perspective: recent past vs. distant past) x 2 (scope size: 5 CD-set
vs. 10 CD-set) between-subjects design.

15.1.2 Procedure and Measures

Respondents were recruited outside of graduation ceremonies right after they ended and
were asked to complete two supposedly unrelated studies for class projects. The purpose
of the alleged first study was to manipulate respondents’ retrospective time perspectives.
Under the cover story that this study was interested in people’s important life events, they
were asked to recall and write about a graduation they have attended, either recently
(recent past condition) or in the past (distant past condition). After respondents wrote
about this graduation event, they were then asked to recall when this graduation took
place. Based on the year they indicated, a new measure—the number of years that has
passed since the recalled graduation event—was constructed. This measure served as a
manipulation check for time perspective. Participants were also asked additional
questions to make the cover story more plausible. For instance, respondents were asked
to indicate the type of graduation ceremony, from junior high school to graduate school, and whose graduation ceremony it was for, their own graduation or someone else’s.

In the second study, respondents were given a variant version of the Madonna study in Hsee and Rottenstreich (2004, Study 1). Music CDs from the Beatles was adopted because this legendary band presumably appealed to a wide audience, and graduation attendees were likely to vary in age (respondents’ age ranged from 17 to 75). As a cover story, respondents were told that the purpose of this study was to understand how people evaluate second-hand products and their ability to identify with and project themselves into hypothetical situations. They were asked to imagine that a friend of theirs who was from abroad had to unexpectedly leave the United States. This friend was a Beatles fan, owned a number of their CDs, and wanted to sell the CDs to them as a bundle. The bundle was described as composing five or ten Beatles CDs that respondents do not currently own, which served as the scope manipulation. Respondents were then asked their maximum willingness-to-pay for the bundle of CDs. This was the main dependent measure of this study. Also, respondents were asked to indicate their liking for the Beatles music in general on a seven-point scale from “not at all” to “very much,” and basic background information such as gender and age. At the end of the overall study, some respondents were randomly selected for demand checks. See Appendix H for stimuli used in this experiment.
15.2 Results

Seven participants were removed from the analyses either because (a) they did not complete the entire survey, or (b) their valuations were more than three standard deviations from the mean, violating assumptions of ANOVA. As a result, responses from one hundred and fourteen participants were used in all analyses in a 2 (past time perspectives) x 2 (scope size) ANOVA design with (1, 110) degrees of freedom.

15.2.1 Preliminary Checks and Analyses

On average, respondents reported owning about 1.85 albums by the Beatles. Older respondents reported higher liking for the Beatles ($\beta=.02; t=1.85, p=.07$). The time perspective manipulation was successful. Results revealed a significant main effect of this factor ($F=25.53, p<.0001$), with respondents in the distant past conditions recalling graduation events that occurred longer years ago ($M=6.57$ years) than did respondents in the recent past conditions ($M=0.48$ years). At the end of the study, some respondents were randomly selected to help assess whether they saw the link between the studies. Although the experimenter gave a cover story about the studies upon approaching the respondents, it was still possible that results were driven by demand characteristics. When probed, none of these participants showed suspicion about relation between the two studies. On average, respondents also indicated that they have a moderately high liking for music by the Beatles ($M=4.81$ on a 7-point scale). After submitting this measure to a 2 (time perspective) x 2 (scope size) between subjects ANOVA, results showed a marginally significant effect of scope size on participants' self-reported liking.
of the Beatles (F=3.02, p=.085). Participants indicated higher liking for the Beatles in the 10-CD set condition (M=5.09) than the 5-CD set condition (M=4.52). But, more importantly, liking of the Beatles was not predicted by time perspective or interaction of these two factors (both p’s>.32).

15.2.2 Willingness-to-Pay for CD-Bundle

A 2x2 ANOVA model uncovered a nonsignificant main effect of time perspective (F<1) but a marginally significant main effect of scope (F=3.10, p=.08) on respondents’ WTP for the CD-bundle, showing not surprisingly that respondents were willing to pay more for 10-CD bundle (M$_{10\text{-CD}}=$$46.57) than for 5-CD bundle (M$_{5\text{-CD}}=$$30.20). More important, this main effect of scope size was qualified by a significant interaction effect of time perspective and scope size on respondents’ WTP (F=4.19, p<.05). Participants in the recent-past conditions were willing to pay comparable amounts of money for the 5-CD and 10-CD set (M$_{5\text{-CD}}=$$36.66, M$_{10\text{-CD}}=$$34.00; F<1), exhibiting the expected scope insensitivity bias associated with affective valuation. In contrast, respondents in the distant-past conditions did not exhibit such bias: They were willing to pay significantly more for a 10-CD set (M=$59.14) than a 5-CD set (M=$23.75; F=7.26, p<.01). Figure 15.1 outlines results of this experiment.
15.2.3 Alternative Explanations

Although respondents in the recent-past (vs. distant-past) conditions were more likely to write about someone else's (vs. their own) graduation event ($P_{\text{recent-past}}=57\%$ vs. $P_{\text{distant-past}}=25\%$), analyses revealed that whose graduation event they wrote about (as well as interaction of this factor with scope) did not predict their WTP for the CD-bundle (both $p's>.22$). This ruled out the alternative explanation that, rather than time perspectives playing a role, respondents were more likely to use their feelings because they recalled their own graduation events (Hsee and Rottenstreich 2004; Kahneman et al. 1999). In addition, this alternative explanation would be more plausible only if respondents in the recent-past conditions were more likely than those in the distant-past conditions to write about their own graduation events. Therefore, difference in content of recalled graduation event cannot explain the main results of this experiment.
15.3 Discussion

Experiment 9 extended results from earlier experiments on time perspectives and the scope insensitivity bias by using retrospective time perspectives. Findings from Experiment 9 demonstrated that when the time perspective is closer to the present, participants were more likely to demonstrate a characteristic of the affective system in judgments and decisions—a neglect for the scope information. Using different primes for both time perspectives and scope, Experiment 7, 8, and 9 collectively showed that participants relied more on their feelings when they were prompted time perspectives closer to the present—whether they were anticipating the near future or looking back in recent past. Through the scope-insensitivity bias, results supported the prediction that affective system is more likely to be engaged when the time perspective is closer to the present than at a distant time, and this occurs both prospectively and retrospectively.

There were several limitations of this study. First, because this study was collected in the field, it was difficult to collect confounding checks. One plausible alternative explanation of the findings is that feeling intensity (i.e., how strongly respondents felt), as opposed to the hypothesized reliance on feelings (i.e., participants’ use of feelings), changed with time perspectives. That is, describing recent graduation events may have prolonged respondents’ phenomenal experiences coming out of the graduation, while recalling distant graduation events may have cooled down their excitement. For recent past respondents, these extended feelings from attending the graduation ceremony may have transferred to the subsequent valuation task for CD-bundles, leading to the observed scope insensitivity pattern. Because distant past respondents described a different event, the intensity of feelings they experienced after the graduation may have cooled down,
allowing them to read the valuation task more objectively. Hence, the difference in intensity of residue feelings from attending the graduation event, rather than use of feelings as information for valuation, may have influenced respondents’ WTP. Second, related to the earlier point, it was unclear what the source of affect was. Although respondents indicated moderately high liking for the Beatles and music CDs was an affectively-rich product domain, was it really their affective reactions towards the Beatles? Or, was it residue feelings from the graduation events? It seems likely that intensity of feelings, rather than use of feelings, may have lead to the observed findings. These limitations of the present study suggest that additional studies are needed using retrospective time perspectives.
Chapter 16

General Conclusion

As the famed American writer Mark Twain once said, "Time cools; time clarifies; no mood can be maintained quite unaltered through the course of hours."\(^{14}\) He points out one of the effects of time, suggesting the role of time in moderating feelings. American culture also seems to recognize the strong correlation between time and feelings, as exemplified in proverbs such as "Time heals all wounds" and "Time flies when you're having fun." This research adds a different perspective on the effect of time on feelings by suggesting that not only do people experience more intense feelings in the present, they are also more likely to rely on them as pieces of information in the present.

16.1 Summary of Results

The general proposition of this dissertation is that the affective, feeling-based system is more likely to be engaged in judgments and decisions that are anchored in the present than in comparable judgments and decisions that are anchored in a more distant time horizon, whether future or past. Two consequences of the overall engagement of the affective system in the present were specifically examined through (a) a greater weighting of feelings as inputs to decisions (*weighting of feelings hypothesis*), and (b) a greater neglect for scope size in valuation decisions (*mode of thinking hypothesis*). Regarding the *weighting of feelings hypothesis*, it is predicted that once the affective system becomes engaged, affective feelings, as programs of this system, should be

\(^{14}\) http://www.quotationspage.com/quote/1645.html
weighted more heavily as inputs to decisions. If the affective system is indeed more likely to be engaged in the present, then consumers should be more likely to rely on their feelings as inputs to decisions in the present than comparable decisions for the future. A greater reliance on feelings in the present would be a direct test of the main proposition. Affect as a decision system of the present—with a greater overall engagement of the system in the present—has additional implications. Regarding the mode of thinking hypothesis, it is predicted that the engagement of the affective system can change the way consumers construe a decision context. Once the affective system is engaged, characteristics of the affective system in judgments and decisions should become more pronounced. If the affective system is more likely to be engaged in the present, then consumers should be more likely to exhibit these characteristics—such as a greater neglect for the more quantitative information—in making decisions in the present. A greater neglect for scope in the present would be an indirect demonstration of the main proposition. Both direct and indirect methods were employed in assessing the engagement of the affective system in the present.

Experiments 1-6 tested the weighting of feelings hypothesis that consumers are more likely to rely on their feelings in decisions set in the present than in comparable decisions set in the future. This hypothesis was examined through a series of marketing contexts such as apartment choices, video game evaluations, and evaluations of past vacations. Various sources of feelings and manipulations of time perspectives were considered across these experiments. It was observed across six experiments that the influence of either integral or momentary feelings on evaluative judgments was more pronounced.
among participants who had time orientations closer to the present than among participants who were under distant past or distant future orientations. This effect of greater reliance on feelings under a present orientation was found with feelings coming from different sources, including (a) feelings manipulated integrally using affect-eliciting properties of the target option and (b) feelings manipulated incidentally through mood-inducing videos irrelevant to the target option. Moreover, different manipulations of time orientations (imagined, natural) were used and different time orientations (past, future) considered.

Experiment 1-3 directly tested the main hypothesis by examining participants’ reliance on integral feelings toward the two target apartments. One of the target apartments was designed to be the affectively-superior option, presumably eliciting more positive feelings than the other option. Different manipulations of future orientations were used in experiments 1-3. Whereas experiment 1 asked participants to imagine an event that would place either in the near future or in the distant future, experiment 2 and 3 simply asked participants to think about the same event that would take place in the future. But, because this event was expected to occur at different points in time across participants, participants in experiment 2 and 3 were naturally prompted either a near future or a distant future orientation. These experiments collectively demonstrated greater reliance on integral feelings in the present: compared to more distant future, nearer future orientations increases relative preference for the affectively-superior option. Note that intensity of stimulus-induced affect was held constant across time perspectives in experiment 1-3. This suggests that nearer future participants were more likely to use
affect as information in their decisions, even though they experienced comparable levels of arousal as distant future participants did. Moreover, experiment 3 provided initial evidence on the underlying decision process of time perspectives and suggested that there is greater reliance on feelings in the present because it is more natural to rely on one's feelings in the present than in the future. This is consistent with the main proposition and that the affective system is a decision system of the present.

Experiment 4-6 tested the weighting of feelings hypothesis by examining participants' reliance on incidental feelings in judgments and decisions. Participants' momentary feelings were manipulated through videos unrelated to the target of evaluation. It was found in experiment 4 that momentary feelings carried over to participants' evaluations of the target stimulus only if they were under near future (as opposed to distant future) orientations, even though attributes of the target option was held constant across conditions. Therefore, this experiment also directly addressed a plausible alternative explanation of experiments 1-2 that time perspectives may have inadvertently changed the weighting of attributes of the options unrelated to affect. While experiment 1-4 tested the effects of future orientations, experiment 5-6 extended these findings to past orientations. If the affective system is a system of the present, then its activation should also be more likely when participants were prompted to think about a more recent past. This hypothesis was tested in experiments 5-6 using different manipulations of past orientations. Experiment 5 primed past orientations through stimulus materials and asked participants to imagine themselves playing video games that were made either about twenty years ago (distant past) or in recent years (recent past), whereas experiment 6
asked participants to recall past vacations from either two years ago (distant past) or a few weeks ago (recent past). Results from both experiments suggested that more recent past orientations increase the reliance on incidental feelings in making evaluative judgments. Together, experiment 4-6 provided even more convincing evidence that it is the greater weighting of affective feelings itself that increases under time orientations closer to the present.

Alternatively, experiments 7-9 tested a different implication of the greater activation of the affective system in the present. These experiments focused on the mode of thinking hypothesis that consumers are more likely to exhibit characteristics of the affective system in judgments and decisions under a present orientation. In particular, the scope insensitivity bias (or insensitive to the magnitude/scope information in making valuation decisions) that is associated with the affective system in decision making was used to demonstrate indirectly the activation of this system in the present. Experiment 7 showed that nearer future orientation increases the scope insensitivity bias in making valuation decisions as compared to a more distant future orientation. Further, experiment 8 identified an important moderator of the use of feelings in the present—the availability of affective information. It was found that, when affective information was removed or greatly reduced from the decision context, the scope insensitivity bias disappears in the present. When the affective information was removed, even near future participants took into account the quantitative scope of the target. Experiment 9 conceptually replicated experiment 7’s results for past orientations and found that even priming a more recent past orientation increases the neglect for scope as compared to a distant past orientation.
16.2 Theoretical Implications

16.2.1 Affect in Judgments and Decision Making

Much work in the affect-as-information domain demonstrates that people are more likely to rely on their feelings when such feelings are perceived as informative and relevant to the judgment at hand (see Raghunathan and Pham 1999). Holding the objective diagnosticity and representativeness of feelings constant, this research suggests that a present orientation can independently trigger a relatively greater activation of the affective system. As a result of the greater relative activation of the affective system, outputs of this system—affective feelings—receive greater weights in judgments and decisions set in the present. Hence, this research adds to the affect-as-information literature by suggesting that consumers are more likely to rely on their feelings under a time orientation closer to the present than one that is more remote.

Findings from this research also suggest that consumers are not necessarily slaves to their passions nor are they completely powerless in the face of emotions, as implied by much of previous work (e.g., current and delayed affective responses are differentially accessible). Implication from past research suggests that people’s evaluations and behaviors are overwhelmed by the presence of affective feelings, especially intense ones. Because feelings about current and delayed decisions tend to be differentially accessible, consumers often act against their better judgments and give into immediate temptations, victimized by the intense feelings they experience with current decisions. In contrast, implication from this research suggests that consumers may exert some control over these “passions” in making evaluative judgments and decisions. They may not rely on their
feelings, even when these feelings are intensely experienced. This provides a different perspective on the role of feelings in judgments than the view that is commonly acknowledged. In summary, this research is in line with work illustrating a more systematic use of feelings as information (Pham 1998; Schwarz and Clore 2007; Schwarz and Clore 1983). The current research supports the view that people can be selective in their reliance on feelings, and not necessarily only as a peripheral strategy (Avnet and Pham 2007; Pham 1998; Schwarz et al. 1987).

16.2.2 Dual System Models

On the basis of the systems’ assumed evolutionary properties, most dual system models (reviewed in Chapter 3) outline processing characteristics of the systems once they are instantiated. Less focus has been placed on identifying the factors that stimulate the systems. This research suggests a new situational trigger of the two systems: time orientations can differentially activate the two systems, leading to a greater relative weight placed on the affective system in the present. Further, a new characteristic of the two systems has been identified. Relatively speaking, the affective system is more present-oriented, whereas the cognitive system is more past-oriented or future-oriented. Most, if not all, of the dual-system models proposed (Forgas 1995; Petty et al. 1993) have not yet explicitly recognized this temporal property as a processing characteristic of the two systems. This temporal property is also consistent with the other evolutionary properties and processing characteristics identified by most of these dual system models.
16.2.3 Time and Decision Making

A considerable amount of research on time has illustrated that consumers often place higher value on a near-future reward than on a distant-future reward, even when the distant-future reward is overall more valuable (e.g., Epstein 1994; Kahneman and Frederick 2002; Sloman 1996; Smith and DeCoste 2000; Strack and Deutsch 2004). Past research has typically suggested that immediate temptations are difficult to resist because focusing on the affective or "hot" features of the reward produces visceral, arousing states. These visceral, arousing states are typically not experienced with long-term rewards. Thus, a differential accessibility of current and delayed feelings causes a tendency to prefer immediate temptations over long-term rewards. The current research offers a new and different explanation for the preference for immediate gratification. That is, resisting immediate temptation for a delayed, overall more valuable reward is difficult because the design of the affective, feeling-based system has evolved to focus on the present situation. As a consequence, consumers are more likely to use and rely on their feelings for decisions anchored in the present time than for comparable decisions anchored at a more distant time. Resisting immediate temptations is difficult for at least two reasons: Not only do consumers experience more intense feelings about immediate rewards than about delayed rewards, but they also tend to rely on their feelings in making decisions across time.

This research demonstrates a greater influence of affective information in the present, even in situations that cannot be accounted for by the accessibility of feelings explanation. For instance, this new weighing of feelings mechanism suggests that consumers are more
likely to rely on their feelings for imminent decisions, even when they have the same
phenomenal experiences about remote decisions. Experiments 1-6 held the accessibility
of feelings constant across time, yet demonstrated a greater influence of affective feelings
in judgments and decisions in the present. The accessibility of feelings explanation
cannot account for these findings. This old explanation would posit that feelings exert
different influences depending on how accessible they are. If the affective information is
equally accessible, then it should have comparable influences on decisions across time.
Hence, whereas affect-dependent time discounting posits a change in affective content of
outcomes across time, this research speculates a change in judgmental process across
time.

A greater engagement of the affective system in the present also leads to implications that
cannot be explained by the accessibility of feelings explanation. Experiments 7-9
showed that, not only do participants rely more on their feelings in the present, their
whole way of thinking about the situation—the way they construe the environment—
becomes different once the affective system is engaged. These experiments again held
the accessibility of feelings constant in decisions across time, yet demonstrated a greater
neglect for scope (a characteristic of the affective system in valuation) in the present.

One may argue that the hypothesized and observed tendency to rely on feelings in the
present may merely reflect a change in people's self-control strategy across time
perspectives. Research in self-control has already suggested and demonstrated that
people are often myopic and shortsighted decision makers, overweighting immediate
benefits over long-term benefits (e.g., see (Ainslie 1975; Ainslie and Haslam 1992; Loewenstein and Elster 1992; Mischel et al. 1989). Translating this to different types of consumption goods, a relative vice option provides greater immediate benefits and lesser delayed benefits than a relative virtuous option (Ainslie 1975; Schelling 1992; Thaler and Shefrin 1981). In the short-term, people are more likely to give-in to a vice option (e.g., chocolate cake), which provides relatively more of the immediate benefits and less of the delayed benefits, than a virtuous option (e.g., fruit salad). Hoch and Loewenstein (Wertenbroch 1998) modeled this behavior as a conflict between two psychological forces—desire and willpower.

Using the language of self-control research, experiment 1 and 2’s findings can be interpreted as the following: compared to farsighted participants who are deciding for the distant-future, shortsighted participants who are deciding for the near-future were more likely to prefer the relative “vice” option (the affectively-superior apartment) over the relative “virtuous” option (cognitively-superior apartment). However, while this alternative explanation may partially account for the greater preference for the affectively-superior option in the near-future than in the distant-future, it cannot address the observed interaction effect of momentary mood and time perspective (or, more specifically, the simple effect of mood within near-future condition) in experiment 4’s finding. There are two reasons. First, the self-control explanation would apply only if there were at least two options in the consideration set, a vice and a virtue. Because experiment 4 provided only one target option to be evaluated, the self-control explanation would be silent in making predictions (i.e., there is no self-control dilemma). Second,
assuming that participants may perceive this target option as a vice and search for other more virtuous options elsewhere, this alternative account would predict that near-future participants would prefer this vice option irrespective of the valence of their momentary moods. Feeling good or bad about the target option would not change its immediate and delayed benefits. Thus, the self-control explanation would predict only a main effect of time perspective in experiment 4. In contrast, as hypothesized in this dissertation, a relative change in decision process across time perspectives can explain the observed interaction effect of momentary mood and time perspective. As with experiment 4, this alternative explanation of self-control cannot address experiments 5 and 6’s findings. These two experiments showed that even time orientations of the past can influence participants’ preferences, while the self-control explanation can only explain effects of future time perspectives. Thus, experiments 5 and 6 further ruled out this alternative explanation by prompting past time perspectives. In summary, the current research does provide an explanation that differs from the standard self-control explanations in decision conflicts over time. It also provides a process-level explanation to why self-control dilemma occurs.

This research also contributes to the stream of research investigating the discrepancy between different types of utility (e.g., decision utility and experienced utility; see Chapter 5 for a review). The current research offers an alternative account to why people’s remembered and predicted utilities often diverge from their actual, experienced utility. People may be relying on different processes when recalling the past or predicting the future than when they are reporting ongoing affective experiences. When
they are recalling the past or predicting the future, they may be relying on a relatively more cognitive process. In contrast, when they are reporting ongoing experiences, they may be relying on a relatively more affective process. For instance, in the domain of affective forecasting, this research recognizes a new cause to the impact bias: the different judgmental processes underlying prediction of future event and reporting of current, on-going event. Affective forecasts of future experience tend to diverge from actual experience because the former is about affective beliefs (a product of the cognitive process) and the latter is about affective feelings (1991). Predicted utility diverges from experienced utility because the affective beliefs people hold are different from the genuine feelings they experience.

Such interpretation can also apply to retrospective evaluations in which affective recalls of past experience are reconstructed affective beliefs. In a related work, Robinson and Clore’s (a product of the affective process; see Robinson and Clore 2002a) hypothesized that people rely on different judgment strategies in their self-reports of emotion over short versus long time frames. They suggested that people tend to retrieve episodic, experiential emotion knowledge when reporting over short time frames, but that they retrieve semantic, conceptual emotion knowledge when reporting over long time frames (2002b). In line with their conjecture and Smith and DeCoste’s (2000) two-memory systems model, the current framework argues that time frames can differentially activate the two systems, and focusing on the more recent past leads to a relatively greater activation of the affective system. This relates to Suh, Diener, and Fujita’s (Robinson
and Clore 2002b) finding that only recent events matter in influencing judgments of subjective well-being.

In addition to the tendency to misremember the past and mispredict the future, research has found that final moments of retrospective experience and/or beginning moments of prospective experience typically receive disproportionate weights in the overall evaluation of that experience (1996). Soman (2003) referred this phenomenon as the Temporal Proximity Hypothesis. One interpretation that follows from this research is that these select moments receive greater affective weights because they are closer to the present. This may also explain why people’s anticipation and recollection of an event are often more comparable to each other than to their actual experience during the event (Kahneman et al. 1993; Redelmeier et al. 2003; Soman 2003). For instance, Mitchell et al. (1997) found that people’s anticipation and recollection of vacation or bike trip were more positive or “rosier” than their actual experience during the event. Likewise, Wirtz and colleagues (2003) found that predicted and remembered affective experiences were more positive, but also more negative, than actual ongoing experiences. They further found that remembered experiences were better predictors for future choice of affective experiences. Again, these results can be reinterpreted as caused by a differential weighting of cognitive vs. affective processes, whereby a relatively more reason-based, cognitive process is used in predicting future and remembering past affective experiences, and a relatively more feeling-based, affective process dominates in reporting on-line experiences. In short, this research offers an alternative, process-based explanation to the divergence of different utilities, accounting for both prospective and retrospective biases.
16.3 Marketing Implications

Many consumer decisions have a “natural” timeline in determining when they are usually made. Some examples of purchase decisions that are usually planned in advance include retirement (401k) plan, insurance, durable goods, seasonal goods (e.g., holiday merchandise), and airline tickets. One of the implications from the current research is that marketers can design different product appeals—with an affect-focus or a reason-focus—depending on the anticipated timing of consumers’ decisions for the particular product consumption. By taking into account the natural timing of consumer decisions, marketers can promote the product accordingly by emphasizing either its affective or cognitive dimensions. Presumably, products should seem more appealing to consumers when affective dimensions are emphasized for imminent decisions, and cognitive dimensions are highlighted for remote decisions. Note that, in addition to the natural timing of certain consumer decisions, consumers may differ in their dispositional tendency in when they make purchase decisions. For the same product purchases, some consumers routinely purchase in advance whereas other consumers routinely purchase last minute (e.g., last minute vacation packages). Marketers can design product or advertising appeals based on the consumer segment they want to target.

For product consumption domains where consumers’ timing of decisions seem less apparent, marketers can similarly “set” the time perspective in making a product appear more attractive. This approach can be especially useful for products that are particularly strong in either affective or cognitive dimensions. Based on the specific strengths of the product, marketers can promote accordingly by prompting a specific time perspective.
For a product that is more appealing on its cognitive dimensions (e.g., utilitarian or informational goods), marketers can advertise this product by prompting a distant past or distant future perspective. In contrast, for a product that is more appealing on its affective dimensions (e.g., hedonic goods), marketers should advertise the product by prompting a present-oriented perspective.

This research also has implications for consumer decisions involving a number of items or products. In promoting product bundles, it may be effective to prompt a distant past or distant future orientation and highlight the number of items in a bundle. In addition, for imminent decisions, it may not matter as much whether to emphasize the number of items in a bundle or not. But for distant decisions, it may be especially effective to point out the number of items in a bundle.

16.4 Open Questions and Directions for Future Research

Findings from experiments 1-9 suggest that—given two systems available for decision making—consumers seem to shift the relative weights they place on their affective vs. cognitive systems in assessing value in judgments and decisions, using their feelings selectively depending on the time perspectives they adopted. Several plausible alternative explanations were ruled out, such as the differential accessibility of current and delayed affective reactions (experiment 4), change in decision process across time perspectives (experiment 1 and 4), unintended correlates of time perspectives (experiment 3, 4, and 8), and time discounting of delayed consumption (experiment 5, 6, and 9). Between experiments 4 and 5, distant-past perspectives were found to exert
comparable effects as distant-future perspectives, and recent-past perspectives more similar to near-future perspectives. Results emerged holding the affective experience constant and outside of the delay of gratification and self-control domains. In short, this research demonstrates a new characteristic of affect as a decision system and suggests that the reliance on feelings can be more selective and flexible than previously thought in the literature. Several open questions remain that may be worthy of future research.

First, a worthy future direction is to identify potential factors that moderate the effect of time on the reliance on feelings. One possibility is to examine how the nature of consumption (experiential vs. instrumental) interacts with time perspective. As mentioned in Chapter 6, under certain situations, feelings may remain informative for distal events. Previous research has suggested that moods are more likely to be incorporated in certain type of judgments (Pham 1998; Adaval 2001; Young and Wyer 2004). Pham (1998) suggested that consumers are more likely to rely on their feelings under experiential motives than instrumental motives. Depending on underlying consumption motives and nature of product category, it is possible that the hypothesized and empirical findings are more likely to hold in some situations than others (see Kim and Rao 2007). Hence, a potential future study is to manipulate consumption motives (experiential vs. instrumental) and time perspective (near future vs. distant future). Findings from such a study may potentially help rectify discrepant findings on positive discounting and negative discounting.
Second, although there is preliminary evidence for the underlying judgmental process of time orientations, additional research is needed. Findings from experiment 3 seem to suggest that the reliance on feelings is more likely for decisions set in the present because this decision process is more natural when used in the present. Reliance on feelings may just "feel right" when used for decisions set in the present than for comparable decisions set in other times. There is initial evidence that time perspective may have influenced consumers' decision process in two stages. First, it changes consumers' mental representation of the decision problem. Representation of target objects may have become affect-free once a distant time perspective (past or future) has been activated. Then, time perspective changes the relative weighting of affective inputs based on this representation. This conjecture can help explain why distant-future participants in experiment 3 were unable to rely on their feelings even after they were explicitly instructed to do so. There are also other possibilities not directly addressed by the nine experiments. For instance, does a nearer future orientation increase the perceived diagnosticity of feelings because feelings typically provide information about the present environment? Also, perhaps feelings as information are perceived as more predictive of one's current situation than one's future state. Further investigation can help shed light on the decision processes underlying time orientations. For example, future studies can directly measure the perceived diagnosticity of feelings in making decisions across time.

Third, following up on these two earlier points, an interesting question is whether affective feelings are necessary more intensely experienced for immediate outcomes than remote outcomes. Our personal experiences seem to agree that this is what happens in
most situations. We tend to feel much more strongly about a tempting dessert that is
given to us right now than one that will be given to us later. Van Boven and colleagues
suggest that people seem to intuitively associate stronger feelings with the present,
judging temporally immediate emotions to be more intense than temporally distant
emotions (2003) and using the intensity of feelings as a proxy for psychological distance
(even when the actual intensity of feelings is held constant; Van Boven and White 2007).
While research in self-control, delay-of-gratification, and time discounting also seem to
agree that affective feelings tend to be more intense in the present, it is possible that there
are situations in which people experience more intense feelings for outcomes at a more
distant time. One speculation is that people may experience more intense feelings for a
distant event when the event is more affective or hedonic in nature. When affective
values constitute the essence or higher construals of the event, construal level theory
suggests that these higher construals would be weighted more heavily as temporal
distance increases. People may savor and feel much more excited about a dream vacation
taking place three months from now than if the same vacation takes place three days from
now. Hence, feelings may be more intense for a hedonic event taking place in the distant
future than in the near future. Another speculation is that people may experience more
intense feelings for a remote outcome than an immediate outcome when the outcome is
part of an extended sequence of events than when it constitutes a relatively short, one-
time event. As reviewed in Chapter 3 and 5, past research has illustrated that people tend
to prefer increasing trend for experiential consumptions, delaying dinner at the preferred
French restaurant when it was presented as part of a consumption sequence than when it
was presented as a one-time event (Van Boven et al. 2007). It may be that, when an
outcome is part of a consumption profile, its affective values may become more salient and thus weighted more heavily as temporal distance increases. In short, the current research is not arguing that affect is always more intense in the present. There may be situations in which people experience more intense feelings in the future.

Fourth, it is unclear how this research reconciles with construal level theory. One can argue that this research is consistent with construal level theory, because affective feelings tend to be more concrete than cognitions (see Loewenstein and Prelec 1993). But one can also argue that it is not consistent with construal level theory, because affective values tend to be more desirable than cognitive values and construal level theory suggests that desirable attributes should carry greater weight as temporal distance increases. So when do predictions based on this dissertation and those of construal level theory align? When do they diverge? One conjecture is that time perspective may influence representation of the decision problem along (at least) two dimensions: (a) affective/cognitive dimension, and (b) desirability/feasibility dimension. These two dimensions do not necessarily have a one-to-one correspondence. A desirable (feasible) attribute may be either more affective or more cognitive. Similarly, an affective (cognitive) attribute can address either a desirability consideration or a feasibility consideration. Depending on the decision context and information available, it is possible that differences on one dimension would exert a relatively greater influence on consumer decisions across time orientations. For instance, this may occur when the decision context involves affective and cognitive features that have the same type of consideration (e.g., desirability, feasibility). One could argue that, in this situation,
construal level theory is less applicable in making predictions because the decision context does not include both desirability and feasibility concerns. In experiments 1 and 2, most apartment attributes (except rental price) were designed to be desirable but differed in terms of their affective and cognitive appeal. “Size of the apartment” and “view from the apartment” were both desirable attributes, but the former was more cognitive and the latter was more affective. Similarly, there may be situations in which features of the decision involve desirability and feasibility concerns that hold the type of valence (e.g., affective, cognitive) constant. In this situation, predictions based on construal level theory should prevail. In summary, this dissertation offers novel predictions in some decision contexts that cannot be explained solely by construal level theory. It is suggested that time perspective may affect two orthogonal dimensions of a decision problem—affective/cognitive and desirability/feasibility. In many cases, the two theories can make the same predictions for different reasons—when affective features coincide with feasibility concerns and cognitive values correspond to desirability concerns. The interesting question is: What happens when the decision context involves equal tradeoffs between affective/desirable features and cognitive/feasible features? The answer to this question awaits empirical corroboration.

Fifth, following experiments 7-9, it may be worthwhile to examine whether the influence of time perspective applies to other documented properties of the affective system in judgments and decision making. For instance, past research has suggested that reliance  

15 The hypothetical scenario used in experiments 1-4 was designed to downplay participants’ potential concern for this feasibility dimension. Participants were asked to imagine that they have found a well-paying job in the apartment rental scenario.
on feelings can lead to greater consistency in evaluations both interpersonally (Pham et al. 2001) and intrapersonally (Lee, Ariely, Amir 2007). Taken together with implications from the current research, one possible speculation is that nearer future orientations may increase consistency and agreement in evaluations as compared to more distant future orientations.

Sixth, it may be interesting to extend the present findings to other dimensions of psychological distance (e.g., social distance, spatial distance, hypotheticality). As stated in Chapter 6, if the affective system is engaged with decreased psychological distance, this suggests that decreased psychological distance increases the reliance on feelings and the scope insensitivity bias. For example, Raghunathan and Pham (1999) examined the effect of social distance on the reliance on feelings. They observed that participants were more likely to incorporate their feelings into decisions for themselves than for others, suggesting that the reliance on feelings may increase with decreased social distance. Thus, one possible future direction is to examine the effect of decreased social distance on the likelihood to neglect the scope information in making valuation decisions. Extending to physical distance, this can potentially offer a new explanation to the propinquity effect that physical proximity leads to enhanced liking and greater interpersonal attractions (Metcalf and Mischel 1999; Trope and Liberman 2000).

Finally, note that most of the experiments manipulated time perspectives situationally. One extension is to examine the relation between consumers' chronic time perspective (Zimbardo and Boyd 1999) and their reliance on feelings in making judgments and
decisions or likelihood to exhibit the scope insensitivity bias in valuation decisions. The prediction follows that chronically present-oriented consumers would be more likely to rely on their feelings and neglect the scope information in making decisions than either past-oriented or future-oriented consumers would. This may have additional implications for individual pathology and may be especially helpful in suggesting effective therapies or treatments for certain disorders.


Heidbreder, Edna (1933), Seven psychologies. New York, London, Century co.


---- (2005), "Hot-cold empathy gaps and medical decision making," Health Psychology, 24 (4), S49-S56.


Appendix A

Process instructions

Feelings-based instructions:

We would like you to make your decision based on how you would feel toward living in the apartments. As you picture either apartment in your mind, would it feel pleasant to live in this apartment or would it feel unpleasant? In other words, would it make you feel happy, proud, excited, etc. to live there, or would it make you feel unhappy, tense, depressed, etc.? As you make your decision of which apartment to rent, please focus on your emotions and feelings toward each apartment.

Reasons-based instructions:

We would like you to make your decision based on your reason and logic. That is, we would like you to evaluate the balance of pros and cons of living in the two apartments. In other words, thinking logically, are there more advantages (pros) than disadvantages (cons) in living in a particular apartment, or are there more disadvantages (cons) than advantages (pros)? As you make your decision of which apartment to rent, please focus on the logical balance of these pros and cons.
Appendix B

Manipulation of Time Perspectives using Imagined Time of Graduation

Near-Future Perspective:

Imagine that you are about to graduate next month, after years of hard work in college, and that you have accepted a well-paying job in the city. You have been looking forward to this day, which will be in May 2007, envisioning how life would be like after your college graduation. In just a month, you will be starting a new chapter in your life.

As your graduation is approaching next month, you begin your apartment search process, looking for a one-bedroom apartment to rent after your graduation. You are considering the following two apartments that will be available by the time you graduate from college next month:

Distant-Future Perspective:

Imagine that you are about to graduate in a year, after years of hard work in college, and that you have accepted a well-paying job in the city. You have been looking forward to this day, which will be in May 2008, envisioning how life would be like after your college graduation. In just a year, you will be starting a new chapter in your life.

As your graduation is approaching in a year, you begin your apartment search process, looking for a one-bedroom apartment to rent after your graduation. You are considering the following two apartments that will be available by the time you graduate from college in a year:
### Appendix C

*Apartment stimuli*

<table>
<thead>
<tr>
<th>Apartment A</th>
<th>Apartment B</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Characteristics of Apartment A:</strong></td>
<td><strong>Characteristics of Apartment B:</strong></td>
</tr>
<tr>
<td>• Partial courtyard view</td>
<td>• Breathtaking view from most rooms</td>
</tr>
<tr>
<td>• Single window in living room and small window in bedroom</td>
<td>• Oversized windows with lots of sunlight</td>
</tr>
<tr>
<td>• Spacious closet space</td>
<td>• Limited closet space</td>
</tr>
<tr>
<td>• 630 sq. ft.</td>
<td>• 450 sq. ft.</td>
</tr>
<tr>
<td>• Steps from the subway</td>
<td>• Four bus stops from the subway</td>
</tr>
<tr>
<td>• Monthly rent: $1,600</td>
<td>• Monthly rent: $2,300</td>
</tr>
</tbody>
</table>
Appendix D

Manipulation of Time Perspectives Using Expected Time of Graduation

Please take a moment to think about your expected graduation from the current program of study.

Imagine that you are about to graduate, after years of hard work in college, and that you have accepted a well-paying job in the city. As your graduation is approaching, you begin your apartment search process, looking for a one-bedroom apartment to rent after your graduation. You are considering two available apartments.
Appendix E

Manipulation of Momentary Moods

Documentary (Neutral)

Bill Cosby (Positive Mood)

Lorenzo's Oil (Negative mood)
Appendix F

Manipulation of Past Time Perspectives through Stimulus Materials

Distant-Past Perspective:

**Game Title: PONG**

Pong debuted in 1984. This is a simple paddle ball game that plays like table tennis or air hockey and is simple to learn. Its objective is to hit the ball across the playing field by moving the paddle up and down and try your best to hit the ball past your opponent’s paddle on the other side to score. It can play up to two players.

**Game Title: COMBAT**
Combat was developed in 1980. Players pilot a tank around a field apparently constructed out of wooden building blocks, dropping mines and firing shells at the opponent tank. It can play in either the single-player or two-player mode.

**Game Title: DUCK HUNT**

Duck hunt was developed in 1985. Using a zapper light gun for the game, players attempt to shoot down as many ducks or clay pigeons on mid-flight as they can. More than one duck or clay pigeon can appear at once.
Pong debuted in 2007. This is a simple paddle ball game that plays like table tennis or air hockey and is simple to learn. Its objective is to hit the ball across the playing field by moving the paddle up and down and try your best to hit the ball past your opponent's paddle on the other side to score. It can play up to two players.

**Game Title: PONG**

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Combat was developed in 2007. Players pilot a tank around a field apparently constructed out of wooden building blocks, dropping mines and firing shells at the opponent tank. It can play in either the single-player or two-player mode.

**Game Title: DUCK HUNT**

Duck hunt was developed in 2008. Using a zapper light gun for the game, players attempt to shoot down as many ducks or clay pigeons on mid-flight as they can. More than one duck or clay pigeon can appear at once.
Appendix G

Saving Pandas stimuli

Distant-Future Perspective and Four Pandas condition:

Imagine that a team of zoology student volunteers from Columbia University had discovered four pandas in a remote Asian region. These four giant pandas were found in a region with dense bamboos and coniferous mountains, occupying small forest fragments in a small isolated area. Throughout Asia, it has been generally estimated that giant pandas now exist in only a few isolated populations and that most of these contain few individuals. However, habitat encroachment and destruction are posing great threats to the continued existence of giant pandas in the wild. This newly discovered habitat of pandas is facing the same threats: Major construction has already been scheduled for in two years, May 2009, to convert these forests into mining operations and bamboo harvesting. If this area of the forest is destroyed, these newly discovered pandas will face serious survival issues. The team intends to save these endangered animals and is soliciting donations for the rescue effort, to save these pandas from serious survival problem due to construction scheduled in two years (May 2009).

1. The team of zoology student volunteers from Columbia University is soliciting donations from their fellow students, including you. Each image in the table represents one animal that the team discovered. Please indicate the most you would be willing to donate to save these four pandas from the construction scheduled in two years (May 2009), by circling the closest figure (between $0 to $50) below:

<p>| | | | | |</p>
<table>
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<tr>
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<tbody>
<tr>
<td>$0</td>
<td>$10</td>
<td>$20</td>
<td>$30</td>
<td>$40</td>
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Appendix H

Graduation stimuli

Large scope size condition:

**Instructions:** The purpose of this study is to understand how people evaluate second-hand products and their ability to identify with and project themselves into hypothetical situations. Please read the following description of a hypothetical scenario very carefully, imagining that it is real.

Imagine that a good friend of yours who was from a foreign country had to unexpectedly leave the United States for family reasons. This friend is a Beatles fan and owned a number of *The Beatles* CD albums. These CDs are all in good condition, and you do not currently own any of these CDs. Because your friend is leaving the country, he would like to sell the 10 Beatles CDs he owns as a bundle.