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THE ENDOWMENT EFFECT AND EMOTIONS: POSSESSION TRUMPS PASSION

by

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ABSTRACT OF THE DISSERTATION

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Our emotions can exert a powerful influence on our judgments. Decades of psychological research bears witness to the influence of mood on a variety of processes, with mood being treated as a single dimension ranging from good to bad. This scheme, however, does not reflect the diversity of human feeling as conceived by either lay people or psychologists who specialize in emotion, and recent research investigating the impact of emotion on judgment has demonstrated that this scheme is too simple to account for the effects of affect on judgment. A variety of findings have shown that different emotions have differing effects on judgments and decisions, on measures as diverse as subjective probability (DeSteno et al, 2004), risk (Lerner & Keltner, 2001), and judgments of monetary value (Lerner, Small, & Loewenstein, 2004). The Appraisal Tendency Framework attempts to explain these findings, in part by invoking the motivational goals associated with specific emotions in the appraisal literature. Despite the prominent role of goals in the appraisal literature and in the ATF, there has been no attempt to measure the operation of goals in the paradigms where emotions affect judgment. This dissertation attempted to replicate previous research implicating emotion-induced goals as driving the effects of sadness and disgust on the endowment

effect. Importantly, the current study also attempted to measure the activation of these goals, testing a mediational model where emotions activate goals, and those goals drive the effect on judgment. However, despite adequate power, successful manipulation of emotions, and a significant endowment effect, the relationship between the specific emotions and value judgments did not emerge. The proposed intermediate relationships between emotions and goals, and goals and prices, were not confirmed either, though this may have been due to a lack of internal consistency in the goal measures. A meta analysis of the effect of sadness or negative mood on the endowment effect indicated affect as a reliable moderator of the endowment effect, but also a significant level of heterogeneity among reported findings. More research is needed to determine when and how emotion influences the effect of ownership on value.

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Table of Contents

Abstract.....	ii
Acknowledgement.....	iv
Table of Contents.....	v
List of tables.....	vi
List of illustrations.....	vii
Chapter 1: Introduction.....	1
Chapter 2: Review of Emotion and Goal Literature.....	3
Chapter 3: Method.....	24
Chapter 4: Main Analyses.....	30
Chapter 5: Ancillary Analyses.....	48
Chapter 6: Discussion.....	51
Appendix: Emotion Manipulation Check.....	62
References.....	65
Curriculum Vitae.....	71

Lists of tables

Table 1: Meta analysis of sadness' influence on the endowment effect (p. 57).

List of illustrations

Figure 1: Emotions trigger goals, which then influence judgment (p. 2).

Figure 2: Goal activation is thought to mediate effects of emotion on judgment (p. 14).

Figure 3: Relationship between emotion induction condition and z-score of manipulation check subscales for the present study and Lerner, Small, and Loewenstein, 2004 (p.31)

Figure 4: Hypothesized relationship between sadness, change goal, and the endowment effect (p. 33)

Figure 5: Prices by emotion condition, ownership status, and task order (p. 35).

Figure 6: Prices in Lerner, Small, & Loewenstein and the present study (p. 37).

Figure 7: Facilitation scores on the Lexical Decision Task (p. 42).

Chapter 1: Introduction

There is currently a burgeoning interest in how emotions and moods influence judgment and choice. Moods and emotions affect perceptions of likelihood (DeSteno, Petty, Rucker, Wegener, & Braverman, 2004; DeSteno, Petty, Wegener, & Braverman, 2000; Johnson & Tversky, 1983; Lerner et al., 2003; Lerner & Keltner, 2000, 2001; Nygren et al., 1996; Slovic & Peters, 2006) evaluative judgments (Schwarz & Clore, 1983; Finucane et al., 2000), reliance on heuristics (Bless, Clore, Schwarz, Volisano, & Rabe, 1996; Bodenhausen, 1993; Park & Banaji, 2000), and judgment biases (Salovey & Birnbaum, 1989; Yen & Chuang, 2008). A number of theories and frameworks have been proposed to explain these phenomena, including memory-based models (Bower, 1981; Isen, Shaker, Clark, & Karp, 1978), models based on controlled inference (Schwarz, 1990), and blends of the two (Forgas, 1995).

This dissertation focuses on the only one of these theories of emotion and judgment: the appraisal-tendency framework (ATF: Lerner & Keltner, 2000). Unlike most theories of affect and judgment, which are solely concerned with the positive or negative valence of affective experience, the ATF addresses specific emotions. Because the theory bases predictions on discrete emotions rather than the valence of emotion, it can address the situations where emotions of the same valence have differing effects on judgment. In fact, the ATF is currently the only theory that offers an account of the effects of specific emotions on judgment and choice.

In addition to the focus on specific emotions, the ATF also asserts that emotions exert at least part of their influence on judgment through emotion-linked goals (Figure 1), a possibility that has not previously received attention in the judgment and decision

making literature, despite the prominence of goals in emotion research. Some preliminary data has suggested that the role of emotion-induced motivational goals is as important as the subjective feeling state that is often

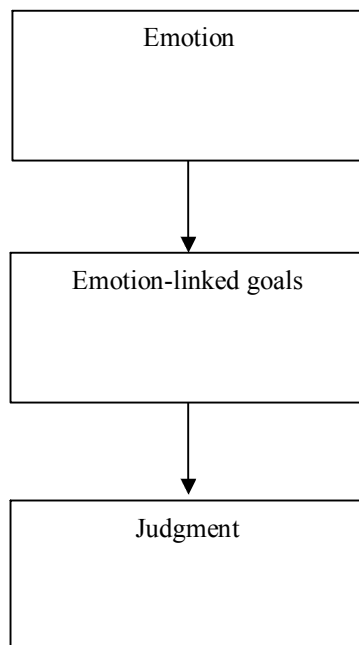


Figure 1. The experience of an emotion is hypothesized to trigger emotion-linked goals, which then exert an effect on judgment.

assumed to affect judgment (Lerner, Goldberg, & Tetlock, 1998). Perhaps most interestingly, the ATF has spawned work that suggests different emotions can eliminate or even reverse well-known decision biases, including the effects of ownership on value—that is, the endowment effect. Such findings may be of great importance to theories of emotion and judgment, our understanding of basic judgment processes, and in the commercial sphere as well. However, as one swallow does not make a summer, breakthroughs must be confirmed, and their generality tested. Therefore, this dissertation will serve to replicate the influence of specific emotions on the endowment effect, and attempt to demonstrate the mediating role of motivational goals.

Chapter 2: Review of emotion and goal literature

Affect

Philosophical discussions on the nature of emotion have been with us a long time. Plato considered affect as one of the three aspects of the tripartite soul, along with cognition and conation (2004). Both Charles Darwin (1872/1998) and William James (1890) wrote about emotion. However, despite the longstanding interest in affective experience and phenomena, there is little consensus in the field, even about the most fundamental issues. Debates rage over whether emotions are discrete categories (e.g., Izard 1977) or made up of more basic dimensions, such as valence and arousal (Schacter & Singer, 1964; Feldman-Barret, 2006), if there are basic emotions that combine to form other emotions, what the criteria for basic-ness is (Ortony & Turner, 1990), whether our emotions are natural kinds to be discovered or constructs we have created (Feldman-Barret, 2006), and what, exactly, is meant by the word emotion. Though the resolution of these debates is not a prerequisite for studying the influence of affect on behavior, some clarification of terms is necessary in order to assess whether the operational definitions in the empirical literature are appropriate.

Psychologists use the term ‘affect’ to describe a variety of phenomenon, and as such there is some confusion in the literature as to what the term means. For instance, affect is used to describe facial expression (flat affect), preferences, and the evaluative component of attitude, as well as moods and more acute emotional experiences. To what extent these things are or are not facets of the same construct is beyond the scope of this dissertation, which will be limited to the impact of moods and emotions. However, even

making a distinction between these two constructs is wrought with difficulty. Where does an irritable mood end and the emotion of anger begin?

The literature on affect and judgment, and the theories that attempt to explain the influence of affect on judgments, make several distinctions among different types of affective experience. A common and longstanding distinction is between moods and emotion. A popular conception of mood is of an emotional state of low intensity, with a pervasive character that does not have a clear target. In contrast, emotions are intense affective experiences, usually short-lived, which have a clear referent. Problematically, judgment researchers attempting to integrate a person's emotional feeling state into their work often assume that mood has no affective color beyond positive and negative, and the few researchers who study specific emotions distinguish their affective states not according to referents and intensity, but to consideration of affective dimensions beyond valence.

So a clear distinction between moods and emotion is not apparent in the operational definitions in the literature. While standard definitions differentiate emotions and moods according to intensity, duration, and referents, the experiments that study affect and judgment do not seem to honor these distinctions in their operational definitions of these states. There are several studies purporting to study the effects of specific emotions on subsequent judgments, but which are not studying the effects of short-lived, intense affective states with clear referents, but rather the effects of recalling such a state. If emotions are different from moods, then this should be reflected in the procedures used to elicit these states. Moods will be elicited in a way that encourages the

affect to be long-lasting, diffuse, and of low intensity. Emotions will be more intense, shorter-lived, and have a clear referent. This is not the case.

The distinction between moods and emotions that is tractably clear in the definition evaporates when attempting to distinguish the two categories of affect by the procedures used to induce them. A negative mood is often induced by writing about a sad event in one's past (e.g. Lambert et al., 1997; Forgas & Bower, 1987; Strack, Schwarz, & Gschneider, 1985) while the emotion of sadness is often induced in the very same way (Tiedens & Linton, 2001; DeSteno et al., 2004). The distinction in practice is not the distinction in theory, but rather whether affect is broken down by valence or by some scheme that allows for more variety than positive, neutral, and negative. Negative moods have typically been operationalized by sadness (though there are exceptions; cf. Zhang & Fishbach, 2005), and positive moods by happiness, amusement, or perhaps surprise. Given the lack of precision in the terms used by researchers in this area, this review will specify the operational definition used in each study, and follow previous authors in adopting the umbrella term of 'affect' for both moods and emotions (Wilder & Simon, 2004).

Similar problems exist with the manipulation checks used in this area. Though emotion is often discussed as involving changes in disparate systems, involving subjective feeling states, characteristic behaviors, and physiological changes (cf. Frijda, 1988; Lazarus, 1991; Zajonc, 1998), the research reviewed here limits its attempts to confirm the presence of a given emotion to self-report scales.

Another distinction popular in the literature is between integral and incidental affect. Unlike the distinction between moods and emotions, this distinction is based on

the relevance of the affect to the judgment or decision at hand, rather than the characteristics of the emotion per se. Integral emotion arises from the decision or target of judgment, though this may be too vague a distinction. For example, the decision about whether to have some elective surgery may be accompanied by fear or disgust arising from aspects of the surgery. This affect would be considered integral to the decision, because it is arising from the target of judgment. However, integral affect has been used not only to describe emotions arising from an object of judgment, but also arising from judgment or choice task itself. For instance, Luce studied decisions where an individual target of judgment was not the cause of the emotion, but the comparison between objects aroused emotion because they forced participants to consider trading off cherished values, such as safety and environmental responsibility against cost (Luce, 1998). This is clearly emotion that is relevant to the decision, but it seems of a different character than being disgusted or angered by an individual option.

Integral affect becomes incidental affect when the person leaves the situation that elicited the emotion, but the emotion remains. The same person who needs to decide about his surgery, still anxious over the prospect of undergoing a procedure, goes shopping for some new clothes as a distraction. The anxiety is now irrelevant to the target of judgment, and so would be termed incidental affect, though it is the same emotion. It is not normatively relevant to his choice of cravat, though it may affect it. Both integral and incidental emotion are the same psychological phenomena, though in the case of integral affect, emotion's role in judgment is not readily disentangled from information about the target, limiting research to correlational or quasi-experimental designs.

Admittedly, using incidental emotions to study the effects of emotion on judgment does bring with it some problems. In most modern theoretical discourse, emotions—at least, acute emotional episodes—are acknowledged to play a functional role, orienting the individual in the environment by directing attention to the object that elicited the emotion, signaling the situation to others through facial expression and posture, preparing the organism physiologically to deal with the circumstances that tend to elicit them, and motivating the appropriate action (cf. Frijda, 1988; Keltner & Kring, 1998; Lerner & Keltner, 2000; Tooby & Cosmides, 1990; Zajonc, 1984, 1998). This suggests that, at least in the case of an acute emotion, judgments are likely to be made with minimal effort because attention and processing resources will be focused on the eliciting event. However, if the eliciting event has been resolved and is no longer a cause for emotion, there is the possibility that the judgment is being affected not only by the emotion under consideration, but by an opponent process (Solomon, 1980).

Another area of confusion is the relationship between evaluation of objects as good or bad and subjective feeling states, and how one may affect the other. Research has demonstrated that objects are evaluated as positive or negative almost immediately upon being encountered, and that this happens automatically (Duckworth et al., 2002; Fazio et al., 1986). It now appears that this evaluation affects mood (Chartrand, van Baaren, & Bargh, 2006; Monahan, Murphy, & Zajonc, 2000), suggesting interplay between affect and judgment at a very basic level. Clearly a great deal of work is left to be done on affect and judgment.

Affect, judgment, and decisions

Though many unanswered questions remain about the origin of moods, the distinction between mood and emotion, and the interplay between integral and incidental emotions, a literature exploring the effects of affect on judgment and decisions has been growing steadily for decades. The domains of judgment are varied, but several patterns have emerged. One is that judgments tend to be affect-congruent, with positive mood or positive emotion leading to more positive judgments; this is especially true of judgments of ambiguous stimuli (Schwarz & Clore, 1983; Forgas, 1995). A second pattern is that common judgment biases are also affected by one's affective state, with certain affective states being more prone to judgment biases than others (Forgas, 1998; Tiedens & Linton, 2001; Bodenhausen, Sheppard, & Kramer, 2000; Park & Banaji, 2000). Demonstrations that emotions moderate decision biases are especially interesting, because they shed light both on emotional processes and also on the mechanisms underlying the bias. For instance, if a decision bias is thought to result from a fundamental way we process information, then an influence of emotion on the bias suggests either that affect is actually a part of that process, or that the bias is based on some other mechanism amenable to emotion effects, such as information processing style (i.e., Chartrand, van Baaren, & Bargh, 2005) or reliance on preexisting knowledge structures (Storbeck & Clore, 2005). Of course, if an emotion affects a bias in a way that does not seem to be the result of more careful information processing, less reliance on preexisting knowledge structures, or affect congruence, then it suggests there is another mechanism operating. The particular mechanism explored in this dissertation is that emotional states trigger certain goal states, and these goal states then have implications for whether a decision bias occurs.

Emotions and goals

Psychological theory postulates a bidirectional relationship between emotions and goals. Appraisal theory (Arnold, 1960), which may be considered the dominant theory in the study of emotions, posits that our emotional state is a reflection of our relationship to our goals. Negative emotions are the result of being blocked from achieving important goals, while positive emotions arise from progress toward cherished goals or their attainment.

Other research and theorizing has suggested that specific emotions serve as a proximal cause for certain goals. Lazarus (1991) has put forward the idea that emotions each have a central theme that captures their cause and the challenge for the organism, including the goals that may be imparted. Roseman and colleagues (1994) have shown that individuals are more likely to endorse certain goals when made to reflect on a time when they were experiencing different emotions. Since activated goals can exert influence on our judgments and decisions regardless of how they were activated (Bargh & Chartrand, 1999), it is possible that one avenue by which emotions affect judgments is by activating goals, with the goals then exerting an influence in concert with other aspects of the emotion (misattributed positive feeling, etc.) or instead of a direct influence of the emotion per se. If emotions do activate goals, then theories of affect and judgment should include the action of emotion-linked goals.

Appraisal-tendency framework

The appraisal-tendency framework (ATF) was proposed by Lerner & Keltner (2000) to account for emotion-specific effects on judgments and decisions. It is noteworthy for being the only theory of affect and judgment that makes explicit

predictions for the effects of specific emotions on judgment and choice—that is, breaks down affective experience beyond the dimension of valence. The framework applies appraisal theory (discussed below) to predict how emotional states will influence judgment and choice.

Appraisal theory primer

Given the central role of appraisal theory in the ATF, I feel a short introduction to appraisal theory is appropriate here.

Appraisal was originally suggested as a cause of emotion by Magda Arnold (1960) and popularized by the work of Richard Lazarus (1982; 1991). The core of the theory is that, rather than events or objects eliciting emotion, it is their meaning for the individual and her goals that inspire feelings. The proposal that cognition implied by appraisal theory is required for the elicitation of emotion formed the basis of Lazarus's public debate with Robert Zajonc (see Lazarus, 1982, 1984; Zajonc, 1980, 1984), and is not universally held (Izard, 1993). Also, whether appraisals are necessary or sufficient to elicit emotion is still a current debate (see Berkowitz & Harmon-Jones, 2004; Clore & Centerbar, 2004; Siemer, Mauss, & Gross, 2007; Smith & Kirby, 2004).

Despite the debate about whether appraisals are causes of emotion, appraisal's role in emotion in general is well-accepted, and numerous theorists have offered specific theories specifying which appraisals account for the variety of human emotions (Arnold, 1960; Fridja, 1986; Lazarus, 1991; Oatly & Johnson-Laird, 1987; Ortony, Clore, & Collins, 1988; Roseman, 1979, 1984; Scherer, 1984, 1988; Smith & Ellsworth, 1985). The focus of much of the work by appraisal theorists has been to determine which assessments differentiate one emotion from another. What assessments determine

whether we feel, for instance, fear or anger in regards to a specific event? Despite the profusion of theories, there is considerable overlap among the theories, if not exactly consensus (see Ellsworth & Scherer, 2003, for a review).

While there is considerable consensus across appraisal theories, there is little work exploring the actual mechanisms of appraisal. There is general agreement that these assessments need not be conscious, and are thought to be implicit assessments more often than otherwise (Ellsworth & Scherer, 2003; Smith & Kirby, 2004). However, the precise nature of the appraisal process is still a mystery, which has been a cause for criticism. Zajonc quipped, "...Lazarus's definitions of cognition and cognitive appraisal also include forms of cognitive appraisal that cannot be observed, verified, or documented" (1984, p.117). Unfortunately, that criticism is still valid today.

A strength of appraisal theory is that the proposed appraisal dimensions specify which emotion we will experience with considerable accuracy (Frijda, 1988; Smith & Ellsworth, 1985), and so it stands to reason that people do appraise the environment somehow, whether consciously or not. There is evidence of very rapid and unconscious evaluation of objects on the dimension of pleasant-unpleasant (e.g., Duckworth et al., 2000; Fazio, Sanbonmatsu, & Kardes, 1986). But there is no evidence for implicit and rapid evaluation of objects on the broader set of dimensions proposed by appraisal theorists. Furthermore, there are a number of dimensions that must be assessed in order to account for the variety of emotional experience. According to Smith and Ellsworth, the dimensions include pleasantness (or goal-congruence), certainty, attentional activity, anticipated effort, control, and responsibility. Though appraisal theorists differ on what appraisals underlie emotions, with some suggesting fewer dimensions, and others as

many as 13, the field clearly thinks there are many assessments that combine to determine one's emotional state.

Appraisal theory is an account of the cause of emotions¹, but appraisals can also be the consequence of emotions (Keltner, Ellsworth, & Edwards, 1993). Experiments which use emotion inductions that do not target appraisal processes directly, but rely on proprioceptive feedback, such as posed facial expressions, result in individuals making the same appraisals as if the emotions were induced in a way that would more directly influence appraisals, such as a saddening story with themes of loss. This observation suggests that appraisals might underlie the effect of emotions on judgments. Indeed, if emotions can influence our appraisal of the environment, these evaluations might also influence our assessments of anything we turn our attention to. Furthermore, the appraisal dimensions suggest how each emotion might influence our judgment on a variety of dimensions, predicting the influence of affect in much greater detail than simply suggesting that feeling good or bad will make things seem better or worse than they really are.

The specifics of the ATF

The ATF applies appraisal theory to judgment and choice. The particular appraisal dimensions incorporated into the framework are the six dimensions found through factor analysis by Smith and Ellsworth (1985), as well as Lazarus's idea of core relational themes (Lazarus, 1991; Smith & Lazarus, 1993). The six dimensions are used to capture the differences among the different emotions quantitatively, while the core themes are a kind of gestalt that sum up an emotion's meaning for the individual.

¹Other causes for emotions have been proposed (*cf.* Izard, 1993; Thompkins, 1984).

Examples include sadness revolving around the theme of loss, fear around the theme of threat, and anger the theme that identifiable others are to blame for harm.

Lerner and Keltner (2000) posit that emotions act to coordinate physiology, attention, thought, and behavior to address the situation that elicits the emotion in a goal-directed way, but these effects are not limited to the eliciting situation. The ATF proposes that emotions influence judgment through “appraisal tendencies”. Emotions are thought to give rise to “an implicit cognitive predisposition to appraise future events in line with the central appraisal dimensions that characterize the emotions—what we call an ‘appraisal tendency.’” These are thought to be “goal-directed processes through which emotions exert their effects upon judgment and choice until the emotion eliciting event is resolved” (Lerner & Tiedens, 2006, p.119). The consequences of these appraisal tendencies are both appraisal-congruent judgment and depth-of-processing effects. Appraisal tendencies are thought to have an especially strong influence when a situation or object is ambiguous, and one of the appraisal dimensions or themes is closely related to the judgment at hand; this results in emotion-congruent judgment, with the influence of the emotion depending upon its associated appraisal. For instance, the constructs of certainty and control are central to risk perception (Slovic, 1987), and so emotions that differ on those appraisal dimensions—such as anger and fear—have different effects on risk perception, despite being of the same valence (Lerner & Keltner, 2000, 2001).

The most original part of the ATF is the suggestion that the core meaning or theme of one’s emotion will activate associated goals, and that judgments and choices will be made in service of these goals, as seen in Figure 2.

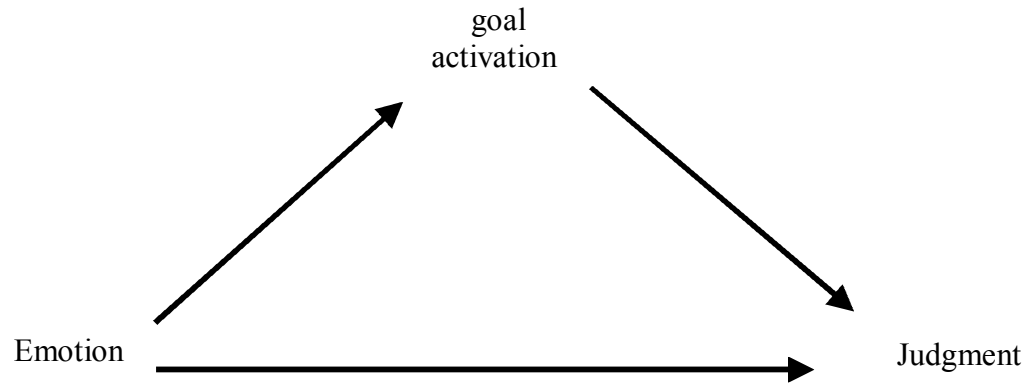


Figure 2. Hypothesized relationship between emotion, goals, and judgment. Observed effect of emotion on judgment are thought to be explained by the activation of emotion-linked goals.

A later addition to the framework suggests that appraisal tendencies have processing consequences. Emotions that are higher in certainty, such as happiness, disgust, and anger, will lead to shallower, more heuristic processing strategies, while emotions lower in certainty, such as sadness, fear, and hope will lead to deeper, more systematic processing (Lerner & Tiedens, 2006).

Goal measurement

The goal-activation aspect of the ATF has yet to receive a direct test. Though previous results have hinted at the action of emotion-induced goals (Lerner, Small, & Loewenstein, 2004), no study has yet measured them and assessed whether goal activation significantly mediates the relationship. Part of the reason may be the difficulty of measuring goals, especially measuring them without either priming the goal (c. f. Bargh et al., 2001) or introducing demand effects, or arousing reactance (Brehm, 1966). This is particularly a concern with explicitly asking participants about goal activation before they perform the task on which the goal might operate.

Another worry is that the emotion-activated goals may operate implicitly, and not be accessible to self-report.

One possibility for measuring goal activation may be through the use of a lexical decision task (LDT). In an LDT, the respondent must decide whether the string of letters presented is a word or not, with faster responses indicating greater cognitive activation of the concept. There is some evidence that the task may be sensitive to activated goals, as well. Words associated with a plan formed to carry out a goal, such as landmarks in a set of directions, are recognized more quickly by people who are pursuing that goal than those who simply read the directions (Aarts, Dijksterhuis, & Midden, 1999).

Similar results were obtained by Marsh and colleagues, who conducted a series of experiments where participants learned simple action scripts, such as the steps involved in brewing coffee, and later informed the participants which of the scripts they would have to carry out, explicitly giving them a goal of performing the behavior (Marsh, Hicks, & Bink, 1998). They found that participants who had yet to complete the intended behavior were faster to respond to the script words related to the behavior they were slated to perform than words from the script they would not perform. Importantly, if the action had already been completed, script words were inhibited, consistent with the principle of the goal being deactivated after attainment (Forster, Liberman, & Friedman, 2007).

Finally, there is also evidence that the LDT may be sensitive to goal activation, even if there are no specific implementation intentions. Aarts and Dijksterhuis (2000) showed that habitual cyclists were faster to recognize the word *cycling* if the goal to travel had been activated, but not if it had not. Thus, the LDT seems to be a viable

indirect or implicit way to measure goal activation, but it has yet to be used to measure the rather abstract goals hypothesized as mediators in the ATF.

Emotion and the endowment effect

One of the most novel predictions derived from ATF is that induced emotions could alter decision processes because of the emotion-triggered appraisal themes. Consequently, emotional states could reduce or even reverse well-known decision biases. One such decision bias is the pivotal phenomenon of the endowment effect (Kahneman, Knetsch, & Thaler, 1990; Thaler, 1980). The endowment effect refers to the gap between mean buying price and selling price, where individuals with an object value the object significantly more than those who do not possess the object. This is not simply that people who think that an item is worth more than its purchase prices are the ones who buy the item in the first place. Rather, experimental evidence suggests that owning an object imbues the object with a value over and above its replacement cost. Previous research has demonstrated that this is a very robust bias, and not attributable to the cost of making a trade, bargaining strategies, or an attachment to one's sentimental possessions, but manifests in situations even when there is no cost to trade, there is no opportunity to bargain, and the item is newly acquired (Kahneman, Knetsch, & Thaler, 1990).

There have been several experiments investigating the impact of affect on the endowment effect. The first study to examine the influence of mood on this bias was conducted by Forgas and Ciarrochi (2001). Before the affect induction, participants were instructed to list three items they owned in each of three price ranges (\$5-20, \$20-50, and \$50-100) and three items in each of those ranges that were not owned, but desired. They then completed an autobiographical writing task to induce either a happy

or sad affective state. After the induction, participants assigned prices to each of a number of items, generated by the participants themselves. For each item, individuals provided a personal price, which for owned items was how much money they would demand in order to sell the item, and for desired items, how much they would be willing to pay for it. Participants also provided an objective value, defined as how much one would actually have to pay to buy the item. Comparing the two provides an index of the value of ownership; if individuals place a larger personal than objective value for an owned item; this represents a kind of endowment effect.

The disparity between personal and commercial value of items was significantly larger among owned items than desired ones, consistent with the endowment effect. However, the effect of mood on the endowment effect emerged only as an interaction with score on the Openness to Feelings (OF) scale (Costa & McCrae, 1985). The difference between personal price and market price was larger in happy individuals who scored high in openness to feelings.

A second study was conducted to replicate the effect using a different affect induction, to ensure the effect was not due to the writing task. The procedure and results were the same, except the affect induction used some edited scenes from a movie involving a death due to cancer—to induced a sad mood—or some scenes from a comedy show. The results were consistent with the first experiment.

However, this study is rather problematic. The procedures do measure a difference between what an item is worth to a person and what it would be worth commercially, but there is nothing non-normative about such a premium; people buy items because they are worth more to them than the purchase price, and that they would

have purchased the items that were most valuable to them before items of less personal worth is very reasonable behavior, not an endowment effect. If I own an iPod, then I most likely value it enough to have bought it, whereas at least some of the people who don't have an iPod value it less; otherwise, they would have bought one.

In a typical demonstration of the bias, some participants are endowed with an item. In many demonstrations this is a mug with a university logo on it, but the effect has been demonstrated with a variety of items, such as nondescript pens (Zhang & Fishbach, 2005), chocolate bars (Kahneman et al., 1990), and highlighter sets (Lerner, Small, & Loewenstein, 2004). After all participants are made familiar with the item, the participants' valuations of the item are elicited. In the case of those who are endowed with the object, the valuation of interest is the minimum amount of money they are willing to accept (WTA) in order to sell the item, so they would prefer to keep their item rather than accept any lesser offer. The other participants provide the maximum amount they would be willing to pay (WTP), so they would prefer to go without the item rather than pay any more for it. Since owning an object should not make the item any more or less valuable, there should be very little discrepancy between the mean willingness to accept and willingness to pay. Typically this is a real decision; either buyers and sellers are matched, and the trades are completed (Kahneman, Knetsch, & Thaler, 1990), or the experimenter determines a price, usually at random, and those who were willing to sell at that price point are given the money for the item (or, in the case of buyers or choice prices, are given the cash), and those who preferred the item at that price point keep it (or are given the item; Lerner et al., 2004). Thus, it is not an idle, abstract exercise in valuation, but a situation with real (albeit minor) consequences involving real money.

The other studies reviewed here more closely to convention, and reach conclusions different from those reached by Forgas and Ciarrochi (2001).

Another study was conducted by Zhang and Fishbach (2005). They provided participants with a pen to complete some surveys. The first of these surveys was actually an affect induction, designed to induce a positive, negative, or neutral mood. Some participants were made to 'pretest' a 'funny thoughts survey' composed of amusing questions. Other participants completed a survey designed to make people feel bad, while neutral mood participants answered a series of general knowledge questions. After the induction, some participants were told that the pen was theirs to keep, but they could sell it back to the experimenter. Other participants were given the opportunity to buy the pen. The transactions were completed after the valuation was made. The endowment effect was eliminated among participants in a positive mood, but was observed among those in a neutral mood, while those in the negative mood condition showed a significantly larger bias.

Lerner and colleagues (Lerner, Small, & Loewenstein, 2004) conducted a similar study, though different affective states were induced, and with much different results. They endowed some of their participants with a set of highlighters, while others did not receive any item, and were told the item was part of a subsequent experiment. Participants then were made to feel sadness, disgust, or a neutral emotion by watching a short film and writing about their experience as though they experienced the situation depicted in the film. Shortly afterward, in what was ostensibly a separate study, participants assigned a value to the highlighter set. The valuation was elicited by a choice-pricing procedure. Participants were told that they would receive either money or

the highlighter set, depending on their preference, but the amount of cash would be determined randomly. For each amount between \$0.50 and \$14.00, in \$0.25 increments, participants indicated whether they would prefer to receive money or the highlighter set. In order to ensure participants took the task seriously and indicated their true preferences, they were informed that after they had completed the study, the amount of compensation would be determined through drawing a random amount, and the choice they made at that amount would be honored.

The endowment effect was replicated among the participants who were in a neutral emotional state (having just seen a documentary on the Great Barrier Reef), as choice prices were significantly higher among the endowed participants than those who were not given ownership of the highlighter set. Interestingly, the pattern actually reversed for sad participants, who assigned a higher value to the highlighter set when they did not own it than when they did, while disgusted participants showed no effect of ownership on choice prices. Disgusted participants showed suppressed prices regardless of ownership status. Some follow-up experiments on disgust (Han, 2006) showed that this effect occurred even if participants were warned about the tendency of disgusted participants to lower their valuations.

Another pair of studies was conducted in Taiwan (Lin, Chuang, Kao, & Kung, 2006). In these studies, participants were either endowed with a mug or not, and then underwent an emotion induction. The first experiment used an autobiographical writing task, about a happy or sad event, while the second experiment used films to induce a happy or sad mood, and then WTA was elicited from mug owners and WTP from those

without a mug. Results from both studies showed that owners valued their mugs more than non-owners, but this difference was only significant for those in a happy mood.

Unfortunately there is little consistency among these studies. The results obtained by Forgas & Ciarocchi (2001) suggest positive affect leads to a greater endowment effect, at least to those high in openness to feelings, while the endowment effect was eliminated among the participants who read a humorous questionnaire before pricing the pen in Zhang and Fishbach's (2005) study. However, as mentioned previously, the methods employed by Forgas & Ciarrochi call into question whether they are really measuring the endowment effect, so there may be no real inconsistency there. There are also some conflicting findings experiments using more typical methods.

The point of greatest agreement is between Lin et al. (2006) and Lerner and colleagues (2004). Lin et al. saw happy participants demonstrate an endowment effect, which was eliminated among their sad participants, while Lerner et al. observed a reversal of the endowment effect among participants who watched a sad film clip. Though not exactly the same result, these are in a consistent direction, despite possible cultural differences between individuals studying in Taiwan and those living in Pittsburgh. However, Zhang and Fishbach (at the University of Chicago) obtained results at odds with both of these studies. They observed a greater endowment effect in those participants who completed a questionnaire intended to produce a negative mood, while those in a positive mood showed no endowment effect.

While these findings seem to contradict one another, there were a variety of procedural differences. Perhaps most importantly, the emotion inductions were different, as the questionnaire used by Zhang and Fishbach to induce negative affect included items

that were not of a single emotion, such as sadness. The items included questions about losing a loved one, being jealous of one's friends, and being pushed around, among others. It is possible the resulting affective state would not be sad, but more heterogeneously negative. Furthermore, the study was conducted in a public place, and so perhaps the induced mood was actually one of mild anxiety, or resentment toward the experimenter. Anxiety might make someone reluctant to change from their current state, so perhaps the prices reflect caution about changing ownership status; those who own the pen will keep it, and those who do not own it will not buy it, though the effects of anxiety have not been studied in the endowment effect². The emotion inductions were also considerably shorter in the Zhang and Fishbach study, raising questions about the time course of the effects.

Another procedural difference concerns when ownership of the endowed item was conferred. Zhang and Fishbach had participants actually use the pens to complete the affect induction, while Lerner and colleagues had only the sellers in possession of the object during the affect induction; it was introduced to the other half of the participants only after the emotion induction was complete. Another difference pertains to the elicitation of values. Zhang and Fishbach had participants actually buying and selling the pen; buyers parted with their own money, while Lerner's buyers were choosing between gaining money and gaining a highlighter set; it is not clear whether the transactions implied by the prices in Lin et al.'s study were carried out.

Clearly, the relationship between the endowment effect and bias is a complicated one. It can eliminate or reverse it, and some emotions might enhance it. However, more

² This possibility is intuitively appealing, but the results of Yen & Chuang (2008), reviewed below, argue against this explanation.

research needs to be conducted to clarify the conditions under which emotion affects valuation, and what mediating mechanisms might be involved. Recent research has replicated the impact of sadness on buying prices, with sadness (induced using the same film clip as in Lerner et al., 2004) increasing buying prices relative to a neutral emotion control (Cryder et al., 2008). Further research is needed, especially to understand what happened in Zhang and Fishbach's study. The results of many studies on mood and judgment should be scrutinized if it turns out that mood effects can be reversed by being in a public place, or if ambivalent negative affect has markedly different effect from sadness, which has often been used as a way to induce a negative mood.

It is possible that factors specific to each study are to blame for the heterogeneous findings. A common concern is that it is not emotion or mood that drives the effects in experiments that use affect inductions, but other aspects of the inductions. The routine procedure is to conduct a similar experiment using a different operational definition of emotion; if the effect was demonstrated with a movie, have participants recall an emotional event in a replication, or at least a different movie that will induce a similar affective state.

Chapter 3: Method

Overview

The current study is an extended replication of the study conducted by Lerner and colleagues (2004) on specific emotions and the endowment effect, with adjustments to the procedure so that the goals thought to mediate the relationship between emotions and the endowment effect might be measured. The current study hews very closely to the original, utilizing the same baseline emotion measure, film clips, and manipulation check. As in the study by Lerner and colleagues, participants were visually isolated from one another, and the endowed item was a set of highlighters. Half of the participants were endowed with a set of highlighters, while other participants were merely shown the highlighters. Participants watched one of three film clips used in previous research to induce disgust, sadness, or a neutral emotion. After the emotion induction, participants provided a monetary value for the highlighters and completed a lexical decision task meant to measure the goals associated with sadness and disgust. The valuation task and lexical decision task were counterbalanced across participants in case the act of deciding the worth of the highlighters in the valuation task served to deactivate the goal, thereby preventing measurement of the goals.

Method

Participants

Four-hundred thirty-six individuals (159 females) were recruited through the psychology department subject pool. Participants received money or a highlighter set for their participation, depending on the preference revealed by their choices in the experiment, as well as partial completion of a course requirement.

Materials

Participants completed all aspects of the experiment on a computer except for the writing task, which was administered on paper. All questionnaire items were presented as single questions in the order in which they appeared in the original paper questionnaires, with participants responding with the computer mouse.

Prescreening questionnaire: Everyone who participated in the subject pool completed a department-wide computerized screening questionnaire before signing up for any study. This questionnaire included a broad variety of measures which are not discussed here, as well as the short form of the need for cognition scale (Cacioppo, Petty, & Kao, 1984).

Baseline Affect: The Positive and Negative Affective States questionnaire was used to measure baseline affect (PANAS, Watson, Clark, & Tellegen, 1988). Lerner and colleagues reported that covarying baseline affect as measured by the PANAS strengthened the relationship between emotion and the endowment effect.

Emotion induction: Emotions were induced through watching a short film clip and a writing exercise. This study used the same procedure and the same sad and disgusting scenes as the study by Lerner, Small, and Loewenstein (2004). Participants in the sadness condition watched the death scene from *The Champ*, which depicts the death of a father in front of his young son. Participants in the disgust condition watched the toilet scene from *Trainspotting*, which depicts a man defecating in a dirty toilet, then attempting to retrieve something from his feces. Neutral-condition participants watched a clip on the kiwi bird taken from the nature documentary *The Life of Birds*. In order to strengthen the emotion induced by the film clip, as well as to maintain consistency

between the current study and previous research, participants in the sad and disgust conditions were instructed to imagine how they would feel if they were the main character in the scene they just watched, and to spend a few minutes writing about how they would feel in that situation. Participants in the neutral emotion condition wrote about what they did during their typical day.

Lexical decision task: I used a lexical decision task (LDT) to assess goal states that were triggered by the emotion elicitation procedure. This task required the participant to judge whether or not a string of letters is a meaningful English word as quickly and accurately as possible. Each trial began with a string of asterisks displayed for 500 milliseconds, followed by the target string of letters, which is displayed until the participant makes a response. There were a total of 100 trials, which were evenly split between real words and non-words to prevent against a response bias. The participant pressed the L key on the keyboard if the letter string was an English word, the A key if it was not. The task began with 10 practice trials, which provided feedback after each response in order to facilitate the participants' learning the task. The practice trials were followed by 100 test trials. These trials were identical to the practice trials except they did not provide feedback. Among the 50 words displayed during the task, 8 are relevant to a 'change circumstances' goal (*change, alter, morph, revise, shift, transform, fix, modify*), and 8 relevant to an 'expel' or 'reject' goal (*reject, expel, deport, eject, disown, dismiss, banish, evict*). If those goals are activated by the experience of the emotions, then I expect the response to be facilitated, that is, to take less time than if the goal were not activated.

Explicit goal measures: In addition to the lexical decision task, I also attempted to measure goals explicitly by having participants rate their agreement to a series of statements. Responses were made on a seven-point scale, ranging from 1 (not at all) to 7 (extremely). The statements relevant to the change goal were: *I want to change my circumstances, I feel like reassessing my priorities, I need to improve my situation, and I feel like everything is okay the way it is* (reverse scored). The reject/expel goal statements consisted of: *I want to avoid taking in anything new, I feel like getting rid of things, I need to cleanse myself of contamination, and I feel like getting something new* (reverse scored).

Valuation task: The worth of the highlighters was measured in a choice task, wherein participants have to indicate their preference for the item (a highlighter set) or an amount of money. The participant indicates with the mouse whether they would prefer the item or the money for each amount, which ranges from \$.50 to \$10.00 in \$.25 increments. This is equivalent to the Becker, Degroot and Marshak (1964) procedure typically employed in research on judgments of the monetary value of items, including the study by Lerner and colleagues (2004), to reveal participants' real valuation of the item. Participants were informed that one of the values would be randomly selected, and that individuals would receive whatever they selected for that value; i.e., if \$2.50 was randomly drawn at the end of the experiment, everyone who indicated a preference for \$2.50 over highlighters would receive \$2.50 in cash, and everyone who indicated a preference for highlighters would take home highlighters.

Manipulation check: Participants' emotional states during the induction were measured with the 27-item scale employed by Lerner and colleagues (2004) to confirm

successful induction of sadness and disgust in their work on the endowment effect. The participant is asked to rate the extent to which they felt each emotion while watching the film clip. The measure includes three items that measure sadness (sad, blue, and downhearted) and three that measure disgust (disgust and repulsed). A copy of this measure can be found in the Appendix.

Market value: During the follow-up questionnaire, participants were asked what they would expect to pay for the set of highlighters at a retail store.

Procedure

The study employed a 3 (emotion: sad, disgust, or neutral emotion) \times 2 (ownership/selling price or not/choice price) \times 2 (task order: goal measurement first or valuation task first) factorial design. The design closely hews to that employed by Lerner and colleagues, but includes the LDT and explicit items intended to measure goal activation. The design is virtually identical to the Lerner study up to and including the emotion induction, but the original study provided only the pricing data as evidence of goals in mediating the effect of emotions, while the current study attempts to measure the goal activation more directly. However, it is possible that the goal measurement preceding the pricing task would alter the very pattern of results on the pricing task that the goals are intended to explain. At the same time, if the pricing is goal-driven, it is possible that making the pricing choices consistent with that goal serves to fulfill the goal, rendering it inactive, and thus leaving no goal activation to measure. Therefore, the order of the goal activation measures and the pricing task was counterbalanced.

Participants were run in groups of up to nine individuals, and told they would complete multiple unrelated studies during the session. After providing informed consent, each participant was seated at a cubicle that prevented them from seeing other participants, which was equipped with a computer and headphones. In the endowed condition, the highlighters were distributed to the participants, and told they would be part of the ‘object valuation’ study that takes place during an intermission in the study with the film clips. For half of the sessions, the instructions informed them that the highlighter set is theirs to keep, and that they will indicate their preference for keeping the highlighters or selling them back to the lab during the object evaluation study, and that a random price-point would be selected, and their indicated preference for that price point honored. In sessions where participants were not endowed with highlighters, the researcher showed all participants one of the highlighter sets, and offering each one the opportunity to handle it and inspect it closely. As in the endowed condition, participants were told that they would receive either the highlighter set or some amount of money according to their choices during the object valuation study.

The participants were told to put on headphones so they may listen to the sound on the film clip. The participants then completed the baseline affect measure, followed by the affect induction. They next completed the valuation task or goal measures, depending on order condition. The manipulation check followed. Participants then completed a few follow-up questions, were checked for suspicion of hypotheses, and debriefed.

Chapter 4: Main analyses

Results

Manipulation checks for emotion induction:

As in Lerner, Small, & Loewenstein's (2004) study, I constructed two subscales using five of the 27 items on the manipulation check. The items assessing sadness were *Downhearted*, *Sad*, and *Blue*. The items measuring disgust were *Disgusted* and *Repulsed*. Both scales showed acceptable reliability, with $\alpha = .86$ for the sad scale and $\alpha = .93$ for the disgust scale. A pair of one-way ANOVAs demonstrated that the emotion manipulations were effective in producing the intended emotions, with the film clips influencing both the sadness subscale, $F(2, 396) = 238.16, \eta^2 = .55, p < .0001$, and the disgust subscale, $F(2, 396) = 369.13, \eta^2 = .65, p < .0001$. As in previous research, sad participants were more sad than disgusted, $t(132) = 16.60, d = 1.53, p < .001$, and disgusted participants were more disgusted than sad, $t(128) = 21.54, d = 2.20, p < .001$. Figure 3 displays the mean z-score of the manipulation check scores by emotion condition for the current study alongside the analogous graph from the study by Lerner, Small, and Loewenstein.

In addition to the analyses conducted in the original study, I also conducted ANOVAs incorporating the effects of order and gender in addition to experimental condition. A 3 (emotion condition) \times 2 (sex) \times 2 (order, LDT first vs. valuation task first) ANOVA on the sadness subscale confirmed the results of the previous analysis, with higher levels of sadness reported in the sad-movie condition $F(2, 369) = 246.62, \eta^2 = .57, p < .0001$. It also revealed a significant main effect of sex, $F(1, 369) = 12.17, \eta^2 = .03, p < .001$, with females reporting higher sadness ($M = 4.87$) than males ($M = 4.31$).

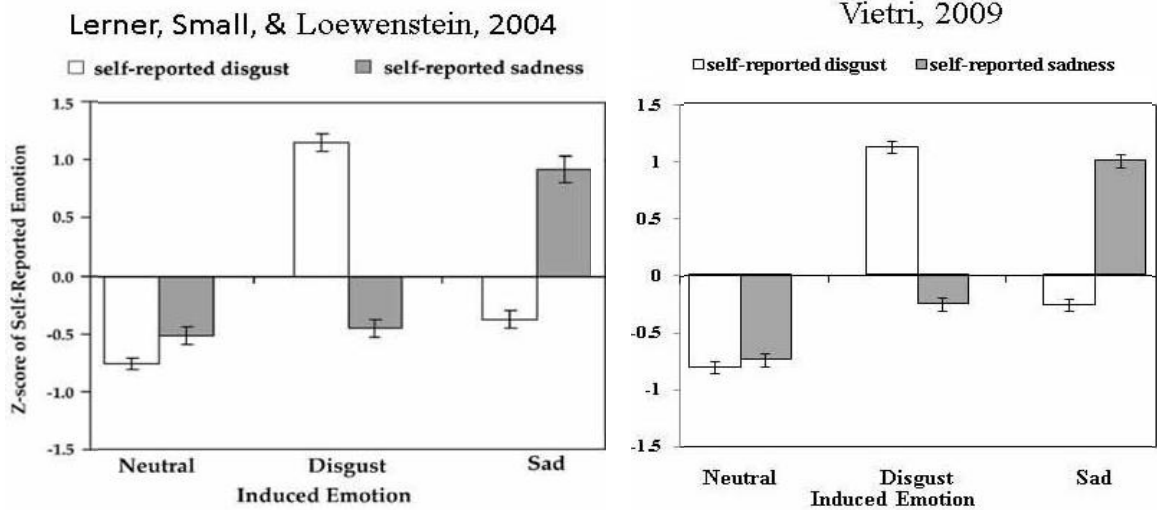


Figure 3. Relationship between emotion induction condition and z-score of manipulation check subscales, for both the present study and Lerner, Small, and Loewenstein, 2004.

This was qualified by an interaction with experimental condition $F(2, 369) = 4.09$, $\eta^2 = .02$, $p < .05$, such that the difference between the induction conditions was greater in females than in males. There was also a marginal effect of order, $F(1, 369) = 3.81$, $\eta^2 = .01$, $p = .052$, with participants who completed the LDT before the valuation task tending to report more sadness ($M = 4.75$) than participants who completed the valuation task first ($M = 4.44$). There was also a significant interaction between order and gender, $F(1, 369) = 8.04$, $\eta^2 = .02$, $p < .01$, with women in the LDT-1st condition tending to be sadder than women who did the valuation task first, whereas order had no effect on males' reported sadness. Order did not interact with experimental condition $F(2, 369) = .21$, $\eta^2 = .00$, $p = .81$, and the three-way interaction was not significant, $F(2, 369) = .03$, $\eta^2 = .00$, $p = .97$.

A similar analysis was conducted on self-reported disgust. As expected, the effect of experimental condition on disgust was confirmed, $F(2, 369) = 360.34$, $\eta^2 = .66$, $p <$

.0001. Participant sex also had a main effect, $F(2, 369) = 15.93$, $\eta^2 = .04$, $p < .001$, with women reporting higher levels of disgust ($M = 5.30$) than men ($M = 4.57$). This was qualified by an interaction between experimental condition and sex, $F(2, 369) = 3.23$, $\eta^2 = .02$, $p < .05$, with women's self-reported disgust being more responsive to the experimental conditions than men's. The interaction between task order and gender approached significance, $F(1, 369) = 3.51$, $\eta^2 = .01$, $p = .06$, as did the three-way interaction $F(2, 369) = 2.43$, $\eta^2 = .01$, $p = .09$.

Goal activation measures:

The explicit goal activation statements were intended to form two scales measuring motivation to a) change one's circumstances and b) distance oneself from possible sources of contamination. Analysis revealed that the items measuring change motivation formed a scale with marginally acceptable reliability, $\alpha = .73$, while the items intended to measure motivation to keep oneself from contamination did not meet the conventional threshold for reliability, $\alpha = .01$. Eliminating the reverse-coded item raised reliability to $\alpha = .50$, still well below acceptable levels.

Consistent with previous literature, a log transformation was applied to the response latencies in the lexical decision task to reduce the positive skew (Aarts, Dijksterhuis, & Midden, 1999; Fazio & Williams, 1986). Because of the difficulty in interpreting incorrect responses, only latencies for correct responses were analyzed. Participants were generally highly accurate, with 96% correct responses. If a goal is active, then associated concepts should be primed, and the words representing those concepts recognized more easily, and therefore more quickly, than if the goal was not activated.

Selling and Choice Prices:

I next examined responses in the valuation task where participants indicated selling prices or choice prices for the set of highlighters. Participants used the entire breadth of the monetary scale. Only participants with consistent preferences were included in the analysis. Because the task is meant to assess the least money they would accept in lieu of the highlighters, anyone who indicated a preference for highlighters at a price point below which they had indicated a preference for money was eliminated from the sample. For example, if someone said she preferred the highlighters to \$4.00 but also preferred \$3.50 to the highlighters, that person would be eliminated, since the highlighters cannot be simultaneously worth more than \$4.00 but less than \$3.50. This resulted in the elimination of 35 participants, leaving a final sample of 401 participants with usable prices. Three dozen participants indicated they would prefer \$0.50 to the highlighters—the lowest price on the scale—and I assigned a value of \$0.25 to their preference for the purpose of the analyses. Others chose the highlighters at all price points, and were assigned a value of \$10.25 for the purposes of the analysis.

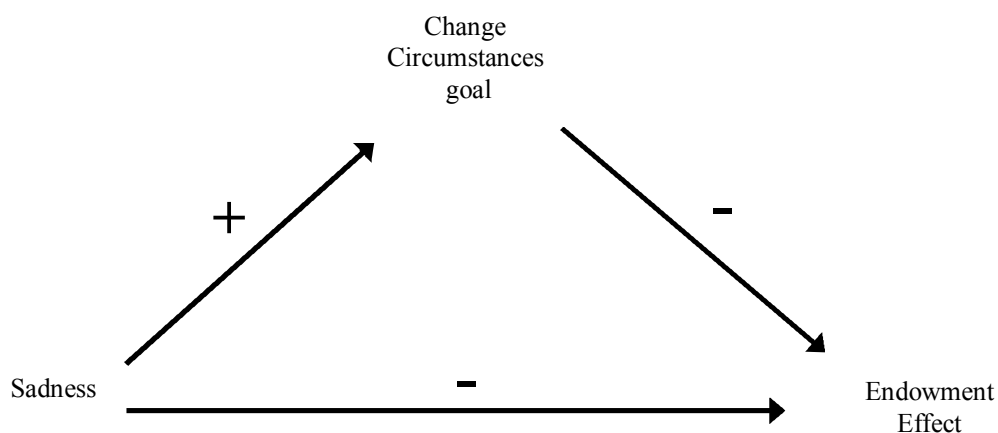


Figure 4. Hypothesized relationship between sadness, goal to change one's circumstances, and the endowment effect. Sadness increases the motivation to change one's circumstances, which then interacts with ownership to determine prices.

Emotions and Prices

The primary purpose of this research is to test whether the effect of emotions on the endowment effect can be explained by goal activation, as hypothesized by Lerner and colleagues, and picture (for the sadness condition) in Figure 4. Having demonstrated the effectiveness of the emotion inductions on the manipulation checks, the next logical step is to confirm an effect of ownership on prices (i.e., the endowment effect) and that this effect is moderated by emotion condition. Participants were expected to show an endowment effect (meaning selling prices higher than choice prices) in the neutral-emotion condition, and the effect should vary by emotion condition. An omnibus ANOVA on the prices assigned to the highlighters was conducted using with 2 (endowment condition: selling or choice prices) by 3 (emotion induction; neutral, sad, or disgust) by 2 (task order; goal measurement before object valuation or vice-versa) by 2 (gender) conditions. As expected, the effect of endowment was significant, $F(1, 359) = 25.17, \eta^2 = .07, p < .001$, with endowed participants demanding an average of \$3.96 cents for their highlighters, while the same highlighters were worth only \$2.60 to participants in the choice condition. Thus, participants demonstrated an endowment effect. The endowment effect was not reduced or reversed by disgust or sadness, however, as evidenced by the lack of an interaction between endowment condition and emotion condition, $F(2, 359) = .12, \eta^2 = .001, p = .89$. The only other significant effect was sex, $F(1, 359) = 4.25, \eta^2 = .01, p < .05$, with females assigning greater value to the highlighters

($M = \$3.56$ vs. $\$3.00$). The mean prices are presented in Figure 5, collapsed across gender for clarity.

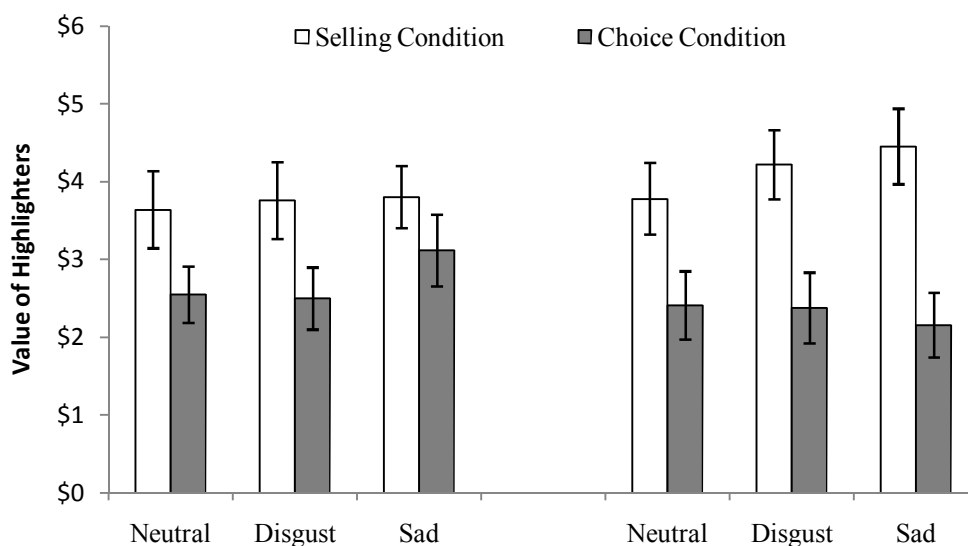


Figure 5. Prices by emotion condition, ownership status, and task order. Error bars represent standard error of the mean.

Given the hypotheses and previous literature, the $3 \times 2 \times 2 \times 2$ ANOVA may have been too conservative a test. Because this study is such a close replication of the study by Lerner and colleagues, the data were also analyzed using separate 2 (selling versus choice) $\times 2$ (emotion versus neutral) ANOVAs for each emotion condition, allowing the endowment effect in each emotion condition to be compared with the endowment effect observed in the neutral condition.

The current study includes tasks intended to measure goal activation, and approximately half of the participants completed these goal-activation measures between the emotion induction and the valuation task, a significant departure from the procedure used in the study conducted by Lerner and colleagues. However, 211 of the participants

completed the goal measures after the valuation task, making the experimental procedure up to and including the valuation task virtually identical to the procedures experienced by the 199 participants in the original study. I therefore performed the contrasts as per Lerner et al., to see whether the effect would replicate in this subset of participants. Figure 6 displays the mean values of the highlighter set by emotion and endowment alongside the analogous values reported in the original study (Lerner, Small, & Loewenstein, 2004).

As with the omnibus ANOVA, these analyses failed to support the hypothesized reversal of the endowment effect among sad participants. Unlike the Lerner study, where selling prices were reduced by sadness relative to the neutral condition, the current study showed no difference in the selling prices of the sad and neutral-condition participants, $t(121) = .66, d = .12, p = .51$. Nor were the choice prices increased by sadness relative to neutral emotion, $t(147) = .29, d = .05, p = .78$. A 2×2 ANOVA confirmed no difference between neutral and sad participant in the endowment effect, $F(1, 141) = .20, \eta^2 = .03, p = .66$.

The expected pattern of results also failed to appear in the disgust condition. Unlike the results obtained by Lerner and colleagues, there was no main effect of disgust on prices, $F(1, 137) = .01, \eta^2 = .00, p = .69$. There was also no interaction between endowment and disgust, indicating that disgust did not moderate the endowment effect in this study, $F(1, 137) = .04, \eta^2 = .00, p = .84$. Rather, the endowment effect was robust in the disgust condition, $t(64) = 2.098, d = .53, p < .05$.

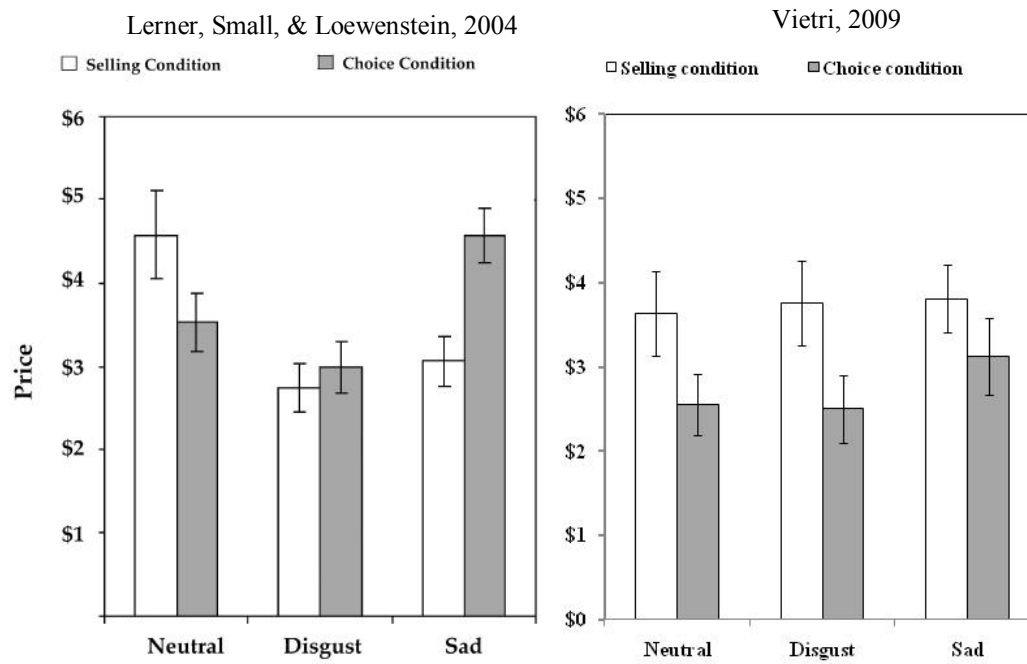


Figure 6. Prices by emotion condition and ownership status for the original study by Lerner, Small, & Loewenstein (2004) and participants in the current study who experienced the procedures in the same order as the original participants.

As mood is known to affect judgment across a variety of domains, it is possible that the effect of the emotion induction on prices coexists with effects of baseline mood, and that this variability in prices is masking the effect of sadness and disgust. Lerner and colleagues (2004) provided some evidence for that, noting that an analysis of covariance that included the PANAS scales showed a stronger effect of the inductions on prices, but reported the analysis without the covariates to provide a more conservative test of the effect. However, no such relationship existed in the present data. A pair of 2 (emotion vs. neutral) $\times 2$ (selling vs. choice prices) $\times 2$ (order) ANCOVAs including the positive and negative scales of the PANAS as covariates yielded the same results as the ANOVAs

without the covariates. When comparing neutral with sadness, there was a main effect of endowment, $F(1, 253) = 19.68, \eta^2 = .07, p < .001$, but no effect of emotion, $F(1, 253) = 1.25, \eta^2 = .01, p = .26$, and no interaction between ownership and emotion $F(1, 253) = .05, \eta^2 = .00, p = .82$. There was no main effect or interaction involving task order, all $F_s(1, 253) < 2.40, \eta^2 < .005, p_s > .12$. The results of the ANCOVA comparing disgusted participants with those in an emotionally-neutral state were similar. There was a significant effect of endowment, $F(1, 250) = 23.00, \eta^2 = .08, p < .001$, but no effect of emotion, $F(1, 250) = .39, \eta^2 = .01, p = .53$, and no interaction between ownership and emotion $F(1, 250) = .24, \eta^2 = .00, p = .64$. Again, no main effect or interaction involving task order was statistically significant, all $F_s(1, 250) < .60, \eta^2 < .01, p_s > .43^3$.

Analyses employing the self-reported emotions were also conducted, and returned similar results. A regression using self-reported sadness, endowment, and the interaction between the two yielded only a main effect of endowment, $B = 1.43, t = 5.63, p < .001^4$, with no effect of either self-reported sadness or the interaction term, $B_s < .1, t_s < .7, p_s > .50$. Similar results were obtained using self-reported disgust, with both self-reported disgust $B = 0.00, t = 0.02, p = .99$ and the interaction between disgust and endowment $B = -.04, t = -0.48, p = .63$ showing no reliable relationship with values assigned to the highlighters.

A final analysis of prices tested the relationship of self-reported emotions within the relevant experimental condition that would arouse that emotion. For example, does self-reported sadness predict prices within participants in the sad condition? The

³ Gender was not a part of the analyses conducted by Lerner and colleagues, and so is not included here in order to preserve power. The conclusions are the same regardless of whether gender is included, except for a significant main effect of gender in the comparison between sad and neutral, $F(1, 236) = 4.64, \eta^2 = .02, p < .05$. Women valued the highlighters more than men ($M_s = 3.70$ vs. 2.97).

⁴ Unstandardized coefficients reported here because they are easily interpretable as dollars and cents.

conclusions were largely the same as in the previous analyses. a regression using ownership, self-reported sadness, and gender to predict prices showed only significant effects of endowment, and gender, though there was some indication of a trend for self-reported sadness to be associated with lower prices among participants who watched the saddening movie $B = -.22, t = -1.64, p = .10$. Most importantly, there was a significant interaction between sadness and endowment within the sad condition, $B = -.53, t(123) = 3.56, p < .01$, consistent with the sadness weakening the endowment effect. Neither the main effect of self-reported sadness $Bs < .05, ts < .50, ps > .50$ nor the interaction reached significance in the other experimental conditions, though the interaction approached significance in the neutral condition $B = .58, ts = 1.88, p = .06$, though in the opposite direction from the sad condition, with sadness *strengthening* the endowment effect. The interaction did not approach significance in the disgust condition, $B = -.36, t(114) = -1.11, p = .27$. A similar series of regressions using disgust as a predictor within each experimental group did not reveal any effect of self-reported disgust on prices, $Bs < -.25, ts < 1.3, ps > .20$. Though the ATF does not hypothesize an interaction between disgust and endowment, such an interaction emerged among participants in the disgust condition, $B = -.48, t(114) = -2.42, p < .05$, but not in either the neutral condition $B = .38, t(126) = .93, p = .35$, or the sadness condition, $B = .15, t(123) = .52, p = .60$.

Emotions and goals

Even if the emotion inductions were to show no effect on the endowment effect or the perceived value of the highlighters, it is possible that the emotions are activating the goals as hypothesized. That is, sadness makes an individual want to change

circumstances, and disgust activates a goal to reject possible sources of contamination. Such a pattern would serve as partial support for the proposed model.

However, a one way ANOVA found no effect of the emotion induction on the explicit measure of change motivation ($M_s = 3.99$ to 4.19 , $SD_s = 1.20$ to 1.36), $F(2, 398) = .767$, $\eta^2 = .00$, $p = .47$. The emotion induction did have a small but significant effect on the three-item version of the decontamination scale, $F(2, 398) = 5.34$, $\eta^2 = .03$, $p < .01$, though post-hoc tests revealed that the significant between-groups difference in decontamination motivation was between participants in the sad condition and neutral-condition participants, with participants in the sad condition showing higher decontamination motivation ($M = 3.18$, $SD = 1.08$) than those in the control condition ($M = 2.71$, $SD = 1.17$), $t(270) = 3.45$, $p < .01$; $d = .37$. Disgusted participants showed a trend toward higher decontamination motivation ($M = 2.99$, $SD = 1.33$) than neutral condition participants ($M = 2.71$, $SD = 1.17$), $t(265) = 1.83$, $p = .07$; $d = .18$, but there was no difference between the two emotion conditions, $t(261) = 1.29$, $p = .20$; $d = .13$.

Self-report measures require an individual to have both introspective access and be willing to report on their mental states to give a valid measurement, and people are often unaware of what is motivating them (Wegener, 2002; Wilson, 2002). Therefore, it is conceivable that the goals that mediate the relationship between the emotion and the endowment effect are operating without conscious awareness, and may be more accurately measured through an implicit measure. If sadness is activating a “change circumstances” goal, and disgust is instilling a goal to reject or expel possible sources of contamination, then sad participants should respond more quickly to the change words than the disgust or neutral participants, while the disgust-condition participants would

show quicker response times to the reject/expel words than words of other categories. However, the mean transformed latencies on the lexical decision task were not affected by the emotion induction for either the change items. A 2 (goal: change vs. reject) \times 3 (emotion; neutral, sad, disgust) by 2 (task order) by 2 (gender) mixed-model ANOVA revealed that participants responded more quickly to the change words than the expel words $F(1, 371) = 27.10, \eta^2 = .07, p < .001$, but no effect of emotion condition, $F(2, 371) = .20, \eta^2 = .00, p = .82$. Most importantly, the difference between the change and expel words was constant across emotion conditions $F(2, 371) = .49, \eta^2 = .00, p = .61$. There were no main effects or interactions involving gender or task order, $F_s < 1.0, \eta_s^2 < .01, p_s > .30$.

While some authors have shown effects of goal activation on response latencies (Aarts, Dijksterhuis, & Midden, 1999), such an analysis does not control for between-subjects variability, and a significant effect can be obscured by baseline differences in reaction time. To correct for this, I calculated facilitation scores by subtracting each participant's mean latency for the neutral trials from that participant's mean latency for each of the goal categories. Mean facilitation scores are presented in Figure 7. This analysis has the advantage of controlling for baseline differences in reaction time, which can be large relative to the effect of goal activation, and therefore could obscure the effect of goal activation on latencies. The facilitation scores were entered into a 2 (word type) by 3 (emotion condition) by 2 (task order) by 2 (gender) ANOVA. As in the first analysis of the latencies, this analysis indicated a main effect of word type, $F(1, 371) = 5.24, \eta^2 = .01, p < .05$, indicating faster responses to change words than expel words. The only other effect that approached significance was a trend towards a main effect of

emotion condition, $F(2, 371) = 2.29$, $\eta^2 = .01$, $p = .10$, with disgusted participants showing greatest facilitation for the goal-relevant words and neutral-emotion participants showing the least facilitation. However, there was no sign of the expected interaction between emotion condition and goal, $F(2, 371) = 1.16$, $\eta^2 = .00$, $p = .31$, indicating that the emotion manipulations did not differentially affect facilitation the recognition of goal-related words.

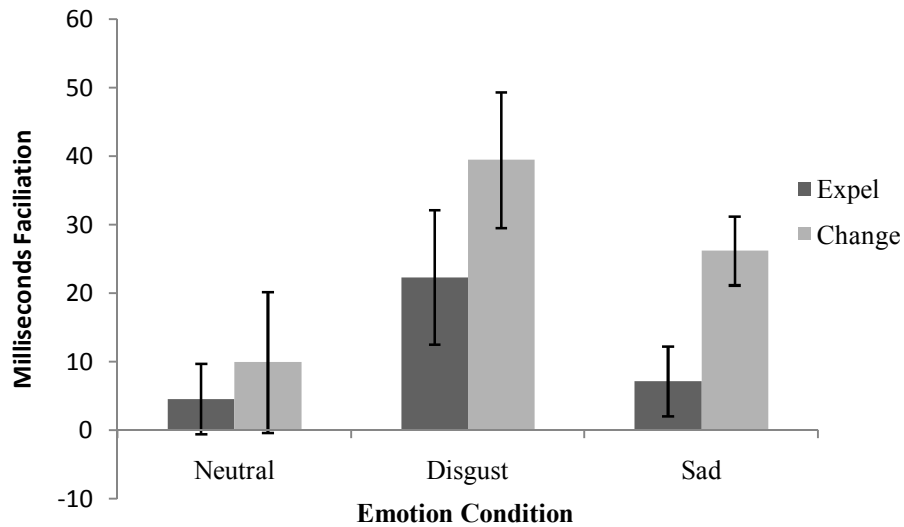


Figure 7. Facilitation scores were calculated by subtracting individual participants' mean latency on neutral-word trials from the mean latency of the expel and change trials. The signs have been reversed for ease of interpretation, so that higher bars indicate greater facilitation.

The relationships between emotions and goals were also investigated using self-reported emotions in lieu of experimental condition. A regression using self-reported sadness, gender, and task order to predict explicit change motivation revealed that as self-reported sadness increased, so did explicit change motivation, $\beta = .19$, $t(377) = 3.71$, $p < .01$, but neither task order $\beta = -.02$, $t(377) = -.35$, $p = .73$, nor gender $\beta = .04$, $t(377)$

$=.70, p = .48$ had an influence. The predictors did not interact with one another, $ts (374) < 1.0, ps > .30$. However, the variables that predicted explicit change motivation did not show any relationship with change facilitation scores in the LDT, $ts < 1.0, ps > .30$.

Regressions testing whether self-reported disgust, task order, and gender were associated with explicit motivation to reject or expel showed an effect of self-reported disgust, $\beta = .12, t(377) = .226, p = .05$, but no other main effects or interactions, $ts < 1.2, ps > .15$. A similar analysis predicting facilitation to expel or reject words in the LDT demonstrated only an effect of gender, with men showing less implicit motivation to reject or expel $\beta = -.12, t(377) = -2.34, p < .05$. There were no other significant main effects or interactions, $ts < 1.0, ps > .30$.

As with the relationship between emotions and prices, the effect of self-reported emotions within each experimental condition on goals was tested. Regressions predicting explicit change motivation using self-reported sadness, gender, and task order demonstrated that self-reported sadness was related to increased change motivation in the neutral emotion group $\beta = .26, t(128) = 2.99, p < .01$ and in the disgust group $\beta = .22, t(119) = 2.46, p < .05$, and neared significance in the sad-emotion group, $\beta = .17, t(125) = 1.88, p = .06$. No other predictors neared significance in any of the groups, $ts < 1, ps > .30$. In contrast, similar regressions predicting facilitation scores for change in the LDT were only predicted by sadness in the control group, $\beta = .04, t(128) = 2.10, p < .05$, but not in the other groups, $ts < 1.5, ps > .10$.

Analogous regressions were calculated to predict motivation to expel or reject. This revealed that the earlier analysis showing an effect of self-reported disgust was not present in the participants who watched the disgust clip, $\beta = .05, t(116) = .50, p = .62$,

but did significantly predict expel/reject motivation among participants in the neutral condition $\beta = .18$, $t(128) = 2.02$, $p < .05$, and neared significance among those who watched the sad movie $\beta = .17$, $t(125) = 1.97$, $p = .052$. There were no significant effects of task order, gender, or interactions, $ts < 1.0$, $ps > .30$. Similar analyses predicting the reject/expel facilitation scores on the LDT revealed that the previously observed gender effect was significant only in the neutral emotion group, $\beta = -.23$, $t(128) = 2.60$, $p < .05$, and neared significance in the disgust group $\beta = -.18$, $t(116) = 1.92$, $p = .058$, but not in the sad group, $\beta = .03$, $t(125) = .37$, $p = .71$. No other predictors neared significance in any of the groups, $ts < 1.4$, $ps > .15$. Finally, a series of regressions were calculated including both self-reported sadness and disgust as predictors in each equation, to test whether self-reported sadness and disgust would uniquely predict change and expel motivation, respectively. However, self-reported sadness emerged as the only significant predictor in each of those analyses, significantly predicting explicit change motivation $\beta = .18$, $t(376) = 3.43$, $p < .01$ and explicit expel/reject motivation $\beta = .20$, $t(376) = 3.81$, $p < .01$, with disgust predicting neither motivation to change, $\beta = .06$, $t(376) = 1.17$, $p = .24$, nor expel/reject, $\beta = .08$, $t(376) = 1.55$, $p = .12$, suggesting no real relationship between disgust and the expel goal.

Correlations between implicit and explicit measures of goal activation

One possible explanation for the lack of relationship between the emotion induction and the goal activation measures is a lack of construct validity in one or both of the measures. Since the manipulation checks show significant effects of the emotion inductions, and also show conventional levels of reliability, the lack of relationship between emotion induction and goal activation is unlikely to be due to a failed emotion

induction or invalid emotion measures. Though the lack of internal validity of the explicit goal activation measure places an upper limit on its usefulness in an analysis of convergent validity, I correlated the facilitation scores from the LDT with the explicit goal activation scales. The explicit reject scale did not correlate with the relevant facilitation score $r = -.04, p = .40$. The change circumstances facilitation score was similarly uncorrelated with the explicit change motivation scale at $r = .06, p = .27$.

However, the lack of a relationship between the explicit measure and the implicit measure is not as great a concern as if the two measures were both explicit measures of goal activation. Indeed, some of the best known implicit measures correlate only modestly with one another when used to measure the same construct, or with explicit measures of the same construct (Cunningham, Preacher, & Banaji, 2001). In fact, there would be little utility in an implicit measure that demands more of the participants' attention, takes longer to complete, and requires more equipment to administer than an explicit measure of the same construct if the implicit measure and explicit measure were perfectly correlated. Rather, the value of implicit measures lies in their ability to tap aspects of constructs that may be inaccessible by other means.

Goals and Prices

While the overall result did not replicate previous research showing emotion as a moderator of the endowment effect, there are several hypothesized relationships in the model that can be supported or refuted by the current study. Perhaps the most interesting implication of the study by Lerner and colleagues is that the goal to change one's circumstances reverses the endowment effect. This would provide support for the ATF by establishing that the hypothesized proximal cause of emotion's influence on the

endowment effect. Indeed, the pattern showing that sadness influences prices in opposite ways in the two ownership conditions is explained by the role of the change circumstances goal, and if such a goal affects prices, it should interact with ownership to influence prices regardless of how it was activated. Indeed, implicitly activated (“primed”) goals and consciously pursued goals have been shown to have the same effects on behavior (Bargh & Chartrand, 1999), and in the absence of evidence to the contrary, I must assume that goals activated by emotion would operate in the same way as well.

A change circumstances goal should make someone more willing to sell his or her item for a lower price, whether that goal was activated by an emotion or not. That goal should also make people more interested in obtaining something they do not have, and therefore to specify a higher price in the choice condition. Meanwhile, the expel goal should lower prices in either condition, regardless of ownership. In order to assess the relationship among goal activation, endowment, and prices, I regressed goal activation and endowment onto the monetary valuations. Because the explicit and implicit measures of goal activation were not correlated with one another, I conducted this analysis with each measure of goal activation separately. Consistent with the ANOVA results, endowment significantly increased the revealed value of the highlighters, $B = 1.42$, $SE = .252$, $t(398) = 5.64$, $p < .001$. However, explicit decontamination motivation marginally predicted *increased* prices, $B = .23$, $SE = .13$, $t(398) = 1.85$, $p = .07$, while there was no relationship between explicit change motivation and prices, $B = .04$, $SE = .12$, $t(398) = .37$, $p = .71$. Endowment did not interact with either explicit change

motivation $B = -.12$, $SE = .20$, $t(399) = -.58$, $p = .57$, or explicit expel motivation, $B = -.27$, $SE = .22$, $t(399) = -1.25$, $p = .21$

A similar analysis of the facilitation scores yielded the same conclusions. Change facilitation scores were not significantly related to prices, $\beta = 0.00$, $t(400) = .28$, $p = .45$, nor was the interaction of change (centered) and endowment, $\beta = 0.00$, $t(400) = .38$, $p = .71$. The facilitation scores for the reject/expel words were similarly unrelated to prices, $\beta = 0.00$, $t(400) = .27$, $p = .98$. As expected, these facilitation scores did not interact with endowment, $\beta = 0.00$, $t(400) = .11$, $p = .91$.

Chapter 5: Ancillary Analyses

The role of self-focus in value judgments

Though Lerner, Small, and Loewenstein hypothesized that goal activation was responsible for the moderating effects of emotions on the endowment effect, subsequent research suggests that self-focus is crucial to the influence of sadness on buying prices (Cryder, Lerner, Gross, & Dahl, 2008). Though that study focused exclusively on buying prices rather than selling or choice prices, the study demonstrated that individuals were willing to pay more money for an item after watching a sad film clip than after watching a neutral film clip, consistent with the previous finding that sadness increases choice prices. However, this relationship only held for individuals who were self-focused. Thus, the result is consistent with the Lerner et al. finding that sadness reverses the endowment effect but indicates that the effect of sadness is moderated by self focus.

In that study self-focus was measured by counting the number of first person pronouns used in the writing portion of the emotion induction. The moderating role of self focus is potentially important in explaining the effects of emotion in the endowment effect, but no replications have yet been reported in the literature. Since the current study used the same emotion induction, the same measure of self-focus could be calculated for each participant. Though the present study elicited only selling and choice prices, the participants in the choice condition face a decision very similar to those participants in the study by Cryder and colleagues: how much money should I part with in order to obtain this object? Though not exactly the same paradigm, the participants in the sad choice condition should behave as the sad buyers in Cryder's study, with increased self-

focus leading to higher prices. However, there was no such relationship between the choice prices of the saddened participants and self-focus, $r = -.15, p = .25$.

The role of individual differences

There is evidence that the decisions of individuals high in need for cognition (NFC; Cacioppo & Petty, 1982) are less affected by transient affective states (Kuvaas & Kaufmann, 2004) than those low in NFC. This difference also extends to mood-induced biases in risky decisions, with individuals high in NFC showing smaller effects of sad mood than low-NFC individuals (Lin, Yen, & Chuang, 2006). It is not clear whether NFC will moderate the influence of sadness on the endowment effect, which is generally considered an instantiation of loss aversion in riskless choice rather than a bias relevant to risk perception. The prices assigned to highlighters were entered into a 3 (emotion; neutral, sad or disgust) by 2 (endowed or not) by 2 (NFC: above or below median) ANOVA. This analysis again demonstrated a main effect of endowment $F(1, 362) = 23.66, \eta^2 = .06, p < .001$, but no other main effects or interactions, $F_s < 2.1, \eta_s^2 < .01, p_s > .14$.

Market value of highlighters

To be thorough, the market values indicated during the debriefing questionnaire were also analyzed in light of the factors hypothesized to influence the selling and choice prices. Estimates of the retail price of the highlighter set were also affected by endowment condition, $F(1, 328) = 5.02, \eta^2 = .02, p < .05$. Mean estimates retail price was \$3.92 in the endowed condition and \$3.46 in the unendowed condition. Retail price estimates were unaffected by emotion condition $F(2, 328) = .06, p = .94$, and there was no interaction between emotion and endowment, $F(2, 328) = 1.0, p = .91$. Thus, these

price estimates also did not show any evidence that emotion induction moderates the endowment effect.

Chapter 6

Discussion

The present study attempted to clarify the role of motivational goals in how our emotional state interacts with ownership to determine the value we place on goods. However, the current study failed to replicate the effect of emotion on the endowment effect previously demonstrated by Lerner and colleagues (Lerner, Small, & Loewenstein, 2004), and consequently could not clarify the role that goals might play as mediators in the effects of emotion on judgment. Rather, the findings of the current study call the reliability of that relationship into question. The current study failed to replicate the moderating effect of emotion on the endowment effect, despite adequate power, strong effects of the emotion induction on the manipulation checks, and a clearly present endowment effect. The study included a condition that was a precise replication of the procedure employed in the previous Lerner et al. (2004) study. When the present results are considered along with the two studies demonstrating a misery-is-not-miserly effect (where sadness increases the price of an object one does not own), it seems that the effect of emotions on economic decisions may be rather fragile—though even fragile effects should replicate when the exact procedures are used (c.f. Brewer & Chapman, 2004). The implications of the Lerner et al. finding for our understanding of emotions and decision making may consequently be less than previously thought.

Analyses within each experimental condition did suggest that emotions as measured by self-report and endowment interact to influence prices, but these results cannot really be cited in support of the ATF. Though self-reported sadness interacted with endowment among sad participants, there was also a similar interaction between

self-reported disgust and endowment among participants in the disgust condition. In both cases, the stronger the focal emotion, the smaller the endowment effect. Instead of a pattern of divergent effects from different negative emotions, the pattern may be most parsimoniously explained by participants focusing more attention on their emotional state, drawing attention away from the ownership manipulation and thereby reducing its weight in the pricing task. Though not significant, the trend towards greater sadness increasing the endowment effect among neutral participants also argues against sadness reversing the endowment effect.

The mediating role of goals

The appraisal tendency framework predicts the effects of specific emotions on judgments, and by extension, decisions based on those judgments. However, unlike earlier theories of affect and judgment, the ATF does not make a strong prediction regarding the mechanism by which affect influences judgment. In recent descriptions of the theory (Lerner, Han, & Keltner, 2007), both memory-based explanations (i.e., Bower, 1981) and the informational use of feelings (i.e., Schwarz, 1990) have been mentioned as possible mechanisms. Another proposed mechanism is the focus of this dissertation, the activation of emotion-related goals (Lerner, Small, & Loewenstein, 2004). How should this failure be interpreted? There seem to be two possibilities. The first possibility is that the measures themselves were to blame for the null result; the proposed goals were activated, but the measures did not detect them. The second possibility is that the proposed goals were not activated, and so the validity of the goal measures is irrelevant.

Given the novel status of the goal measures, the first possibility seems plausible. Unlike the current experiment, studies investigating the influence of goals on behavior

often infer the action of goals by the effect of the goal manipulation on a relevant task, such as achievement motivation resulting in greater perseverance in a word-search task. Attempts to measure goal activation in other ways are few and far between⁵, and so there is an unfortunate lack of validated measures available to assess goal activation. The present study attempted to measure the goal of changing one's circumstances and the goal of rejecting possible sources of contamination through self-report measures and a lexical decision task. These tasks, though based on accepted procedures, were original to this study, and their reliability and validity are not well established. The explicit goal measures were face valid, but lacked internal consistency. The lack of consistency is a problem, since a measure that is not strongly correlated with itself cannot be strongly correlated with anything else, and so would limit my ability to detect relationships between the goals and the other constructs, though there was some evidence that self-reported emotions were associated with goal activation. However, as opposed to the relationships predicted by the ATF, when both sadness and disgust were used to predict goal activation, only sadness emerged as a significant predictor, even for the reject/expel motive.

The lexical decision task, though a common tool to assess the activation of concepts, has not previously been used to assess the particular goals under investigation in this study. It is possible that these tasks were not sensitive enough to detect the relationships under investigation. Thus, if the goals were activated, it is possible that the current measures would not have detected them.

⁵ The studies that do attempt to measure goal activation or goal strength generally rely on face-valid ad hoc measures (c. f. Aarts et al., 2005).

However, that the proposed goals were not activated in the first place is also a distinct possibility. Despite the possible weakness of the goal activation measures, it is important to point out that the previously validated procedures for assessing value and the effectiveness of the emotion induction performed as expected, replicating previous results. The emotion inductions showed robust effects on the manipulation checks, and the endowment effect was present in the neutral condition. In fact, the endowment effect was, if anything, more robust in the present study than in the study by Lerner and colleagues (2004), who had to resort to a single-tailed test to confirm the endowment effect among their neutral-condition participants. If emotions activate goals, and those goals in turn influence the endowment effect, then there should have been an effect of emotion on the endowment effect, regardless of whether the goal measurements were valid or not. The mismeasure of goals would have proven a problem for the mediation analysis, but evidence of their action on prices would have been apparent. Thus, it seems likely that goals were not activated, and so whether the current measures were appropriate is an open question.

The quality of the literature

It is worth noting that the psychological literature addressing the influence of moods and emotions on the endowment effect is limited in quality as well as quantity. A few studies, this dissertation among them, are rigorously controlled laboratory experiments, with participants undergoing the emotion induction procedures and valuing the objects in isolation from other people (e.g., Lerner, Small, & Loewenstein, 2004, Cryder et al., 2008), while other experiments take place in relatively uncontrolled situations. Zhang and Fishbach (2005) conducted their study in a cafeteria, while Lin and

colleagues (2005) seem to have relied on a large classroom setting—though the paper does not make the exact circumstances of the experiment clear. This is important because it is plausible that the same induction would have different effects depending on the context. Just as a poignant moment in private may be rather embarrassing in public, emotion inductions experienced in front of others may have a different psychological impact than those experienced in the isolation of a laboratory cubicle. It is possible that the effects of emotion on judgment are moderated by the situation in which the emotion is experienced, and that some compensatory process is affecting the results of these studies.

Emotion and the endowment effect

Though the primary thrust of the current study was to assess goal activation as a mediator for emotion in the endowment effect, the varied findings in the literature and the lack of a finding here raise the question of whether there is a reliable effect of affect on the endowment effect. There are currently five studies in the literature that report the effect of some affective manipulation on the endowment effect, with all including inductions that might be considered sadness. Does the literature as a whole support a role for emotion—especially sadness—as a moderator of the endowment effect? In order to investigate this systematically, I conducted a meta analysis combining the current study with those previously reported in the literature. While different specific emotions have been shown to have correspondingly specific effects on judgment (Lerner & Keltner, 2001; DeSteno et al., 2004; Raghunathan & Pham, 1999), much of the literature

is concerned with the effects of negative mood. However, as previously mentioned, there is not always a difference in the techniques used to induce these different constructs.

Therefore, this meta analysis includes both studies that induce a negative mood as well as those that induce the specific emotion sadness. The studies are summarized in Table 1.

All studies reported the results of a 2 (emotion) \times 2 (ownership) ANOVA, and all except Lin and colleagues (2008) compared a saddened group with a neutral control. Lin and colleagues used a positive-emotion comparison group. Other work on emotion and judgment comparing positive and negative moods with a neutral control has found that inducing a positive mood often has the opposite effect of inducing sadness (Zhang & Fishbach, 2005; Forgas, 1998; Bless et al., 1996), and so the results of Lin and colleagues errs on the side of overestimating the power of sadness to moderate the endowment effect.

Table 1 shows the effect size of the interaction between ownership and emotion for each study, such that positive values denote a reduction in the endowment effect. The meta analysis confirmed the role of sadness in reducing the endowment effect relative to neutral or positive mood, with an average effect size of $\eta^2 = .04$, $r = 19.2$, with a 95% confidence interval from $r = .13$ to $r = .26$. There was significant heterogeneity among the studies as measured by the Q statistic, $Q(4) = 43.44$, $p < .01$, which is not surprising given one of the five studies showed an effect of sadness of approximately the average magnitude but in the opposite direction. Given the heterogeneity of results, it is possible that some as yet undetermined factor reverses or eliminates the effect of the sadness on the endowment effect. Systematic exploration of how judgments and decisions are

differently affected by emotions in public versus private may provide some explanation for the heterogeneity, and may be of both theoretical and practical importance.

Other explanations for sadness and the endowment effect

The current study found no support for a role of emotion or goals in the endowment effect, the above meta analysis indicates that sadness does reduce the endowment effect. If it is not through goal activation, what is the possible mechanism? There are several possibilities in the literature, the most prominent of which is that the negative evaluation implied by one's feeling state carries over to unrelated judgments (Schwarz, 1990). However, if the perceived value of an object were simply reduced by a constant amount regardless of ownership, then there would likely be no moderation of the endowment effect, but simply a main effect for emotion and a main effect for ownership. All the published studies have demonstrated an interaction between emotion and ownership—though not always in the same direction—suggesting this is not the case. However, it is also possible that there is a floor effect at work, where the two

Table 1. Meta analysis of sadness' influence on the endowment effect.

Study	Affect	Induction technique	Neutral condition	Item	N	Effect of Sadness on EE	Effect size η^2
Lerner, Small, & Loewenstein (2004)	Sadness	Film + writing	Y	Highlighter set	199	Reversed	.09
Vietri 2009	Sadness	Film + writing	Y	Highlighter set	401	None	.00
Zhang & Fishbach (2005), study 1	Negative mood, neutral mood	Downer questionnaire	Y	Pen	114	Increased	-.06
Lin et al. (2006), study 1	Sad mood, positive mood	Writing	N	Mug	160	Eliminated	.20
Lin et al. (2006), study 2	Sad mood, positive mood	Film	N	Mug	240	Eliminated	.09

effects cannot be additive, because the individual realizes that the object does have some use or retail value, and this realization restricts the range of possible values, meaning once an object is devalued, it cannot be devalued much further, creating a statistical interaction.

Another possibility, which seems to be supported by the results of Cryder and colleagues' (2008) study on sadness and buying prices, seems to suggest that the negative emotion influences judgments of value when individuals are focused on themselves, and perhaps this leads to a motivation to enhance one's self-worth through material acquisition. In the case of the Cryder study, the self-enhancement motivation was not limited to the trappings of power and success, but extended even to a lowly plastic water bottle. However, despite this provocative result, it must be pointed out that self-focus was measured rather than manipulated, and so the causal importance of self-focus remains unclear. My own analysis of self-focus did not show a similar relationship among choice prices, despite my employing a larger sample of participants.

Mainstream social-psychological theorizing also points to a role for evaluation of the self in the valuation of objects. In Greenwald and colleagues' unified theory of implicit attitudes (Greenwald, Banaji, Rudman, Farnham, Nosek, & Mellot, 2002), associating an object with the self is expected to change one's evaluation of that object in a way that allows for cognitive consistency. At least as measured at the implicit level, if I associate an object with myself, and I have positive self-esteem, I am expected to positively evaluate that object. Though owning a set of highlighters or a water bottle is likely not as central to one's self-concept as gender, race, or occupation, I expect ownership would lead to a closer association between the self and the object than non-

ownership would. If the emotion manipulation has an affect-congruent effect on self-esteem, then inducing a positive emotion would lead to higher prices among owners, as a high self-worth creates a halo of value around all that a person owns, and may lead to devaluation of things that are not owned. This would be result in the elimination of the endowment effect as observed by Zhang and Fishbach, though it seems that Lin and colleagues results are at odds with this pattern, as they observed an exaggerated endowment effect among happy participants. Putting aside the issue of positive affect, if experiencing a negative emotion leads to a negative implicit attitude toward the self, owned objects may be similarly devalued, and perhaps more value perceived in objects that one does not own. This is consistent with the results of the meta analysis, and suggests a future study testing for mediation of the effect by implicit self-esteem.

Implications for the ATF

The appraisal tendency framework is appealing in part because it provides an avenue for incorporating the dominant theory of discrete emotions into the study of affect and judgment, which has primarily emphasized affective valence to the exclusion of all other affective experience. A novel aspect of the framework is the assertion that goals are part and parcel of emotion effects. That is, judgments are influenced by emotions only while the goal is unfulfilled; the subjective feeling state is secondary, and can persist without influencing judgment.

While the ATF has been successful in predicting the divergent effects of different negative emotions on judgment, especially in risk judgments (Lerner & Keltner, 2000; 2001; Lerner, Gonzalez, Small, & Fischhoff, 2003), there is a distinct lack of studies supporting the proposed role for goals in emotion effects on judgment. The only study

that clearly implicates the operation of goals (Lerner, Small, & Loewenstein, 2004) formed the basis for the present dissertation, but the anticipated reversal of the endowment effect—the only finding that requires invoking goals to explain the results—did not replicate despite painstaking adherence to the procedures employed in the original study. While the meta analysis did confirm a role for the sadness as a moderator of the endowment effect, it did not confirm a reversal of the endowment effect by sadness. Rather, the literature as a whole suggests the endowment effect is merely attenuated by sadness, like many other biases (i.e., Forgas, 1998; Yen & Chuang, 2008), an attenuation that might just as easily be explained by other theories, notably the affect-as-information hypothesis (Schwarz, 1990). As there is increasing consensus on different emotions of the same valence having different effects on judgment, more research attention needs to be paid to the other aspects of the theory, such as the role of goals versus subjective feelings.

Concluding remarks

The effect of emotions on decisions is a worthwhile area of inquiry for a variety of reasons. The first concerns basic psychological theory; how do we form our judgments, and how do we arrive at our decisions? What is the role of affect in these processes? Given the prominent role of affect in our subjective experience, our scientific understanding of the role of mood and emotion in the construction of our preferences, judgments, and decisions is underdeveloped in relation to other aspects of mental life. This argues for further experimentation to determine the causal relationships between affect and judgment, relationships most easily studied using experimentally induced incidental affect.

Experiments on the influence of incidental affect on decisions are also important to our understanding how decisions and judgments operate in increasingly complex world. Modern life is filled with choices, both mundane and pivotal. Since the pace and connectivity of modern life provides a nearly constant stream of affective information—be it text messages from a loved one, an angry email from a supervisor, or the latest gyrations of the stock market—our mood and emotions are likely to fluctuate frequently throughout the course of the day, in close proximity to decisions for which the emotion has little relevance. However, as the results of the current study are any indication, sometimes irrelevant emotions are nothing to fear.

<u>Disdain</u>	0	1	2	3	4	5	6	7	8
Not at all									More strongly than ever
<u>Disgust</u>	0	1	2	3	4	5	6	7	8
Not at all									More strongly than ever
<u>Downhearted</u>	0	1	2	3	4	5	6	7	8
Not at all									More strongly than ever
<u>Elated</u>	0	1	2	3	4	5	6	7	8
Not at all									More strongly than ever
<u>Fearful</u>	0	1	2	3	4	5	6	7	8
Not at all									More strongly than ever
<u>Gleeful</u>	0	1	2	3	4	5	6	7	8
Not at all									More strongly than ever
<u>Interest</u>	0	1	2	3	4	5	6	7	8
Not at all									More strongly than ever
<u>Irritated</u>	0	1	2	3	4	5	6	7	8
Not at all									More strongly than ever
<u>Mad</u>	0	1	2	3	4	5	6	7	8
Not at all									More strongly than ever
<u>Nervous</u>	0	1	2	3	4	5	6	7	8
Not at all									More strongly than ever
<u>Repulsed</u>	0	1	2	3	4	5	6	7	8
Not at all									More strongly than ever

<u>Sad</u>	0	1	2	3	4	5	6	7	8
Not at all									More strongly than ever
<u>Scared</u>	0	1	2	3	4	5	6	7	8
Not at all									More strongly than ever
<u>Scornful</u>	0	1	2	3	4	5	6	7	8
Not at all									More strongly than ever
<u>Surprise</u>	0	1	2	3	4	5	6	7	8
Not at all									More strongly than ever
<u>Tense</u>	0	1	2	3	4	5	6	7	8
Not at all									More strongly than ever
<u>Turned Off</u>	0	1	2	3	4	5	6	7	8
Not at all									More strongly than ever
<u>Warmhearted</u>	0	1	2	3	4	5	6	7	8
Not at all									More strongly than ever

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2003-2004: Research technician, Addictions Treatment Research Center, University of Pennsylvania.

Publications

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