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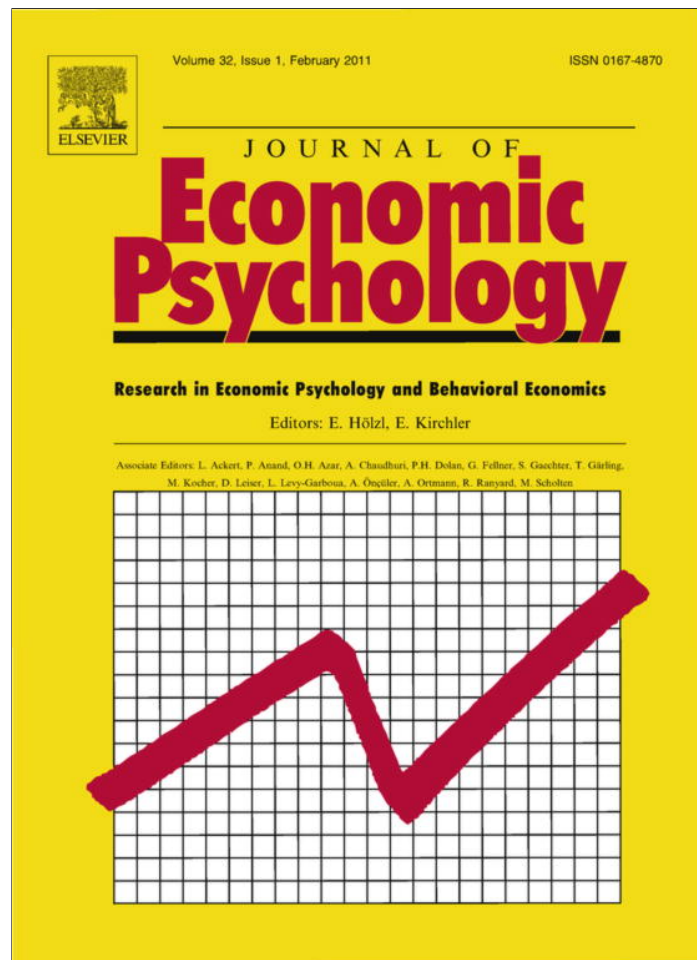
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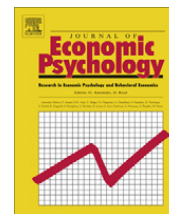
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Regret, disappointment and the endowment effect

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ABSTRACT

The endowment effect is the finding that minimum selling prices for a particular good exceed maximum buying prices. We build on and extend previous research showing that emotions influence the endowment effect, and reveal that the two negatively valenced decision-related emotions, regret and disappointment, have distinct effects on the valuation of an object. We found that an induction of regret eliminates the classic endowment effect, whereas an induction of disappointment reverses it. The findings demonstrate the necessity of a specific emotion approach to understand the effects on decision making.

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1. Introduction

The mere possession of a commodity may influence its perceived value. This is apparent in many daily life situations and also in experimental research. Generally, people tend to hold onto what they have got. As a result, they are inclined to demand more money as compensation for relinquishing a specific object than they are willing to pay so as to obtain the same object. This phenomenon has been labeled “the endowment effect” (Kahneman, Knetsch, & Thaler, 1990; Thaler, 1980). It derives from the concept of loss aversion (Kahneman & Tversky, 1979), according to which losses are weighted more heavily than gains of equal magnitude. Giving up (or selling) an object is perceived as a loss whereas obtaining (or buying) an object is perceived as a gain. Moreover, owning an item creates an association between the item and the self (Beggan, 1992; Morewedge, Shu, Gilbert, & Wilson, 2009), increasing its value for the owner. This effect has been highlighted in economic and psychological literature and is empirically confirmed for a variety of objects (see e.g., Carmon & Ariely, 2000; Carmon, Wertenbroch, & Zeelenberg 2003; Kahneman et al., 1990; Loewenstein & Adler, 1995; Reb & Connolly, 2007; Strahilevitz &

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Loewenstein, 1998; Tom, Lopez, & Demir, 2006; Van de Ven, Zeelenberg, & Van Dijk, 2005; Van Dijk & Van Knippenberg, 1998; Van Dijk & Van Knippenberg, 2005).

Interestingly, as became evident in recent years, the endowment effect may be moderated by the emotional state the decision maker is in when deciding upon the selling or buying price, even if this emotional state is not related to the decision at hand. For example, Lin, Chuang, Kao, and Kung (2006) had participants experience either positive or negative emotions – via recalling unrelated past emotional events and also via unrelated audiovisual stimuli. Next, participants were asked to evaluate how much they would be willing to accept in return for a mug they were endowed with, or how much they would be willing to pay for a mug that was not part of their endowment. In two experiments, Lin et al. found that the endowment effect occurred when positive emotions were induced prior to the valuation, but not when negative emotions were induced.

In a similar experiment, Lerner, Small, and Loewenstein (2004) found differential effects for two different negative emotions, disgust and sadness. They had participants, in an unrelated task, watch film clips that elicited one of those emotions. Next, participants were asked for their selling or choice (buying) prices of a set of highlighters. Choice prices slightly differ from buying prices, as the former type involves choosing between an object or money, whereas the latter type involves obtaining an object by giving up money (see Kahneman et al., 1990). Disgust evokes a tendency to expel current possessions and avoid obtaining new ones (Rozin, Haidt, & McCauley, 1993). Consistent with this, Lerner et al. found that both selling and buying prices were reduced. The reduction of selling prices was prominent due to the increased proximity of the object (in the selling condition) – eliminating the endowment effect completely. On the contrary, sadness is associated with loss and helplessness and evokes a tendency to change one's circumstances (Keltner, Ellsworth, & Edwards, 1993). Getting rid of current possessions (i.e., selling) and acquiring new goods (i.e., buying) both represent clear opportunities for changing one's circumstances. Indeed, Lerner et al. found that sadness reduced selling prices and increased buying prices at the same time – reversing the endowment effect.

Thus, the studies described above both show that negative emotional states that are experienced while expressing the buying or selling prices may attenuate the endowment effect, or even reverse it. In the current article, we extend these findings to other negative emotions that are highly relevant in the context of decision making.

We are interested in the behavioral differences that are associated with regret and disappointment with regard to the endowment effect. Both emotions qualify as prototypical decision-related emotions (Zeelenberg, Nelissen, Breugelmans, & Pieters, 2008). Moreover, they are also highly prevalent. Regret is the second most named emotion, after love (Shimanoff, 1984) and disappointment is the third most experienced emotion, after anxiety and anger (Schimmack & Diener, 1997). Previous research has found that regret and disappointment are clearly different emotions, with distinguishable consequences for decision-making (see for reviews, Martinez, Zeelenberg, & Rijsman, 2008; Zeelenberg, Van Dijk, Manstead, & Van der Pligt, 2000). Additionally, regret and disappointment are found to differ in their appraisals (Van Dijk & Zeelenberg, 2002). The former emotion is appraised as thinking that one could undo the event and as caused by oneself, whereas the latter emotion is more appraised as unexpected, as wanting something pleasurable, as thinking that one was morally right, and as caused by circumstances beyond anyone's control. Recent neuropsychological research and neuroimaging data have stressed both the importance of anticipated regret as a powerful predictor of future decisions (Coricelli et al., 2005), as well as the existence of learning based on cumulative emotional experiences (Coricelli, Dolan, & Sirigu, 2007).

We suggest here that regret and disappointment may have distinct implications for the valuation of objects – and, consequently, may differentially impact the endowment effect. This expectation is first of all based on the finding that regret and disappointment have differential effects on individual decision behavior (Zeelenberg et al., 2000), on consumer behavior in response to dissatisfactory service deliveries (Zeelenberg & Pieters, 2004), and on behavioral decisions in social dilemmas and ultimatum games (Martinez, Zeelenberg, & Rijsman, 2011). Below we elaborate on this and formulate more specific expectations concerning the effect of each emotion. Please note that these predictions are to some extent exploratory, but the setup of our study allows for specific tests of these predictions. This is the case because we include a control condition in which we induce no emotions. We can then compare the effects of inducing regret and disappointment not only to each other, but also to a neutral control condition. Such a neutral control was not present in the Lin et al. (2006) and the Lerner et al. (2004) research.

Before tuning to our expectations and the studies testing them, we would like to draw attention to the fact that in our research, as in the research that inspired us to run these studies (Lerner et al., 2004; Lin et al., 2006), the emotional states that were induced were unrelated to the goods sold or bought. In addition, the emotions had nothing to do with the interaction partner, neither with the experimenter. Put differently, the emotions were incidental or exogenous to the WTP/WTA decision (cf. Zeelenberg et al., 2008). From a rational standpoint, these emotions should have no impact, because they are unrelated to the value of the good. We argue here that effects of such exogenous emotions can best be interpreted as an overgeneralization of the tendencies that are naturally associated with the emotional experience. Because each emotion has a specific phenomenology and specific behavioral tendencies associated with it, we expect differential effects for regret and disappointment. Below we provide the reasoning for the specific effects that we expect. If we were to find support for our predictions, the effects cannot be explained by negative mood, because both regret and disappointment will induce negative mood (an elaborate discussion of how emotions are related to decision making can be found in Zeelenberg et al., 2008). Let us now turn to the specific expectations for regret and disappointment.

We expect regret to reduce or eliminate the endowment effect. This will occur because regret triggers “reparative” actions as people feel responsible for the situation that elicited the emotion (Zeelenberg et al., 2000). Regret is related to an outward focus and a preoccupation with other people, such that it operates as an appeasement emotion (Van Kleef, De Dreu, & Man-

stead, 2006). It has recently been found that regret may make people act more cooperatively in interdependent situations (Martinez et al., 2011). Thus, we predict that after a regret induction, selling prices will decrease (people will want to compensate others by selling their possessions at a lower price) and buying prices will increase (people will be willing to buy at a higher price in order to change their circumstances). We believe that this may attenuate or even cancel out the endowment effect.

We believe that disappointment would have different consequences. We expect disappointment might even reverse the endowment effect. We expect effects similar to those of sadness in the Lerner et al. (2004) study. Indeed, sadness and disappointment are to some extent related, although disappointment is clearly more related to decision making (Zeelenberg et al., 2000). We expect these effects to arise because disappointment involves feelings of powerlessness and evokes the goal of changing one's circumstances, turning away from the event that elicited the emotion. In addition, disappointment signals an inward focus and a preoccupation with the self, operating as a supplication emotion (Martinez et al., 2011; Van Kleef et al., 2006). Thus, we predict that after a disappointment induction, buying prices will increase (people will be willing to pay more in order to obtain a new object that will please them) and selling prices will decrease (people will want to get rid of their current possessions and obtain new ones). Both effects might be strong enough to invert the endowment effect (similar to the effect of sadness in the study of Lerner et al., 2004), as acquiring new goods and getting rid of possessions present a clear opportunity for change.

We first conducted a pilot test of our ideas, using a scenario approach (cf. Van de Ven et al., 2005) in which participants indicated buying and selling prices for lottery tickets. Next, we conducted a market experiment using real possessions (mugs) and enabling real trades to further test our predictions. In both the pilot and the real experiment we first employed an emotion induction procedure and next assessed the valuation of an object. On the basis of ample research, we believe emotions will persist beyond the eliciting situation, influencing subsequent behavior. Based on Lerner et al. (2004) and Lin et al. (2006), our research extended their settings by studying the decision-related emotions regret and disappointment. In addition, we include a Control condition in our experimental design, allowing us to investigate not only whether regret and disappointment lead to different behaviors, but also providing a benchmark to test whether both emotional states actually influence behavior. We were interested in the effects of the induced emotional state on WTA (Willingness to Accept – the lowest price that Sellers are willing to accept to sell an object) and WTP (Willingness to Pay – the highest price Buyers are willing to pay for the same object).

In the pilot study we first induced emotional states (regret, disappointment, or neutral control) in our participants, using a scrambled sentence paradigm (adopted from Reb & Connolly, 2009). Next, in a seemingly unrelated experiment, participants read a scenario concerning a lottery ticket (adapted from Van de Ven et al., 2005). Participants could be Seller or Buyer. Sellers read they were endowed with a lottery ticket that they could sell to someone else, while Buyers read that someone else owned a lottery ticket and (s)he was willing to sell it to them. The lottery ticket could be worth any possible value in the range of €0–€10. We asked Sellers for their WTA and Buyers for their WTP, using a form on which prices were listed from €0.50 to €10 (with €0.50 intervals). This procedure was adopted from Kahneman et al. (1990) (see also, Van de Ven et al.,

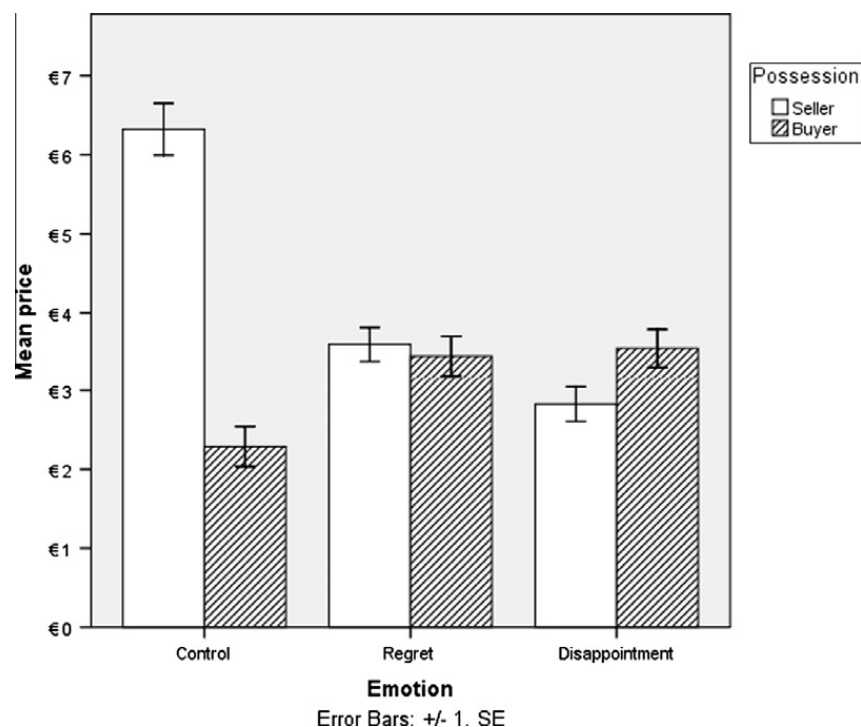


Fig. 1. Average selling (WTA) and buying (WTP) prices for the lottery ticket per emotion condition in pilot study.

2005; Van Dijk & Van Knippenberg, 1996), and also used in the main Experiment (see Appendix A). The findings supported our predictions (see Fig. 1). The endowment effect was present in the Control emotion condition ($M_{WTA} = 6.33$, $SD = 2.08$; $M_{WTP} = 2.29$, $SD = 1.60$; $t(78) = 9.73$, $p < .01$). For the Regret condition, the endowment effect was eliminated ($M_{WTA} = 3.60$, $SD = 1.36$; $M_{WTP} = 3.45$, $SD = 1.61$; $t(78) = 0.45$, ns). Finally, for the Disappointment condition, the endowment effect was reversed ($M_{WTP} = 3.55$, $SD = 1.52$; $M_{WTA} = 2.83$, $SD = 1.40$; $t(78) = 2.22$, $p < .05$). These results increased our conviction that regret and disappointment would differentially impact the endowment effect. Let us now turn to the experimental study in which we endowed some of our participants with a mug and others not, and examined how emotions may affect trading decisions in real markets.

2. Experiment

In the main experiment, we examined our hypothesis more thoroughly by extending the findings from the pilot study in two ways. First, we now chose for a more explicit emotion priming task, the often used autobiographical recall procedure. Second and most importantly, participants were actually endowed with a mug (or not), asked to evaluate it – by assessing sellers' WTA and buyers' WTP – and trade it among themselves. We extended the research of Lerner et al. (2004) and Lin et al. (2006), by including a neutral control condition in addition to the emotion conditions (Regret vs. Disappointment). Again, our prediction was that, as in the pilot study, the endowment effect would exist only in the Control condition – it would disappear in the Regret condition and it would reverse in the Disappointment condition.

2.1. Method

192 students (93 females and 99 males, $M_{age} = 29.4$, $SD = 5.62$) participated voluntarily and were paid a €5 show-up fee upfront. They were randomly assigned to one of conditions of the 2 (Seller vs. Buyer) \times 3 (Emotion: Control vs. Regret vs. Disappointment) between-subjects design. The Appendix A shows all instructions.

Participants entered the laboratory in groups of 30 people at max and received their show-up fee. Half of the participants were individually endowed with a mug (Sellers), and the rest received none (Buyers). Then, in Part I of the study, emotions were induced via an autobiographical recall procedure (e.g., De Hooge, Breugelmans, & Zeelenberg, 2008; Keltner et al., 1993; Martinez et al., 2011). Participants wrote a detailed description of either: (1) a typical day (Control, $n = 64$); (2) a recent experience of regret ($n = 64$), or a recent experience of disappointment ($n = 64$). In Part II, Sellers and Buyers could trade the mugs among themselves in the 'Coffee Mug Market'. They indicated their WTA (Buyers) or WTP (Sellers). Next, the experimenter randomly selected a price (in the range of €0.25–€5), in order to establish the 'market price' for the mug and took care of the trading. We employed the random price mechanism in Becker, DeGroot, and Marschak (1964) because we wanted participants to reveal their true preferences. The €5 show-up fee ensured that all Buyers had enough money for buying a mug. Finally, in Part III, participants were asked to reread their essay and indicate how intensely (1 = not at all; 9 = extremely) they

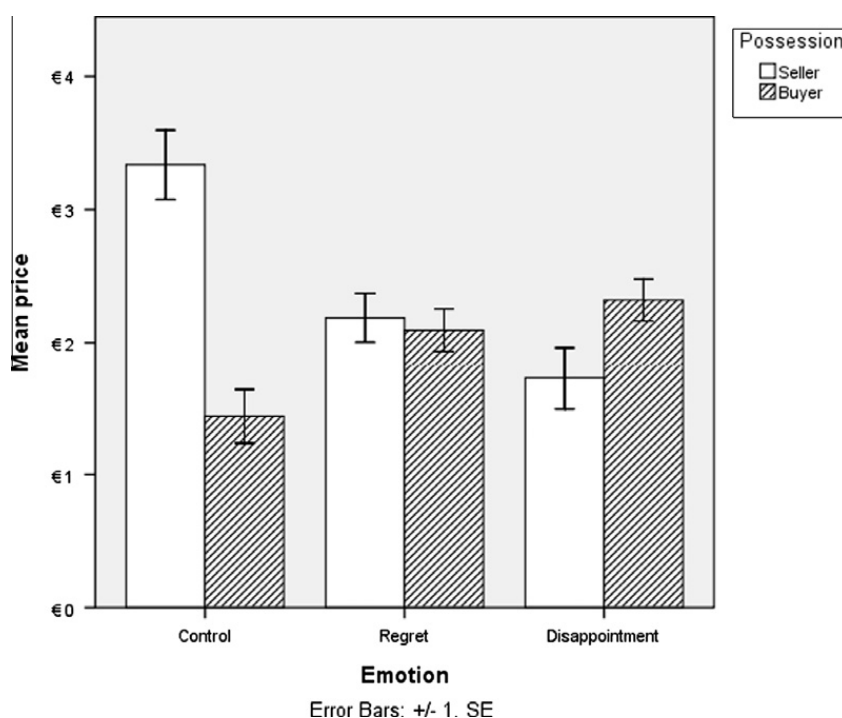


Fig. 2. Average selling (WTA) and buying (WTP) prices for the mug per emotion condition.

felt several emotions, including regret and disappointment (other emotions were guilt, shame, anger, sadness, frustration, envy and fear). Subsequently, all participants were fully debriefed and thanked for their participation.

2.2. Results and discussion

Manipulation checks showed that the emotion induction procedure was effective. Regret levels were high in the Regret condition ($M = 7.33$, $SD = 1.72$) and differed significantly from both other conditions (Regret in the Disappointment condition: $M = 4.02$, $SD = 2.54$, $t(126) = 8.64$, $p < .001$; Regret in the Control condition: $M = 1.47$, $SD = 1.21$, $t(126) = 22.31$, $p < .001$). Also, disappointment levels were high in the Disappointment condition ($M = 8.08$, $SD = 1.01$) and differed significantly from both other two conditions (Disappointment in the Regret condition: $M = 5.31$, $SD = 2.27$, $t(126) = 8.89$, $p < .001$; Disappointment in the Control condition: $M = 1.94$, $SD = 1.67$, $t(126) = 25.15$, $p < .001$). There were no differences between the conditions on the other assessed emotions, listed in the [Appendix A](#).

The findings concerning the valuation of the mug again supported our predictions. A 2 (Seller vs. Buyer) \times 3 (Emotion: Control vs. Regret vs. Disappointment) ANOVA with WTA/WTP as dependent variable showed a significant Seller/Buyer main effect, $F(1, 186) = 7.89$, $p < .01$, $\eta_p^2 = .04$. Overall, this indicates a difference between Sellers ($M = 2.42$, $SD = 1.45$) and Buyers ($M = 1.95$, $SD = 1.04$) – the endowment effect. No Emotion main effect was found, $F(2, 186) = 1.67$, ns . But, the results showed a Seller/Buyer \times Emotion interaction, $F(2, 186) = 20.06$, $p < .001$, $\eta_p^2 = .18$ ¹. Results are presented in [Fig. 2](#). An analysis of simple effects² reveals the existence of the endowment effect only in the Control emotion condition ($M_{WTA} = 3.34$, $SD = 1.48$; $M_{WTP} = 1.44$, $SD = 1.14$; $F(1, 186) = 43.65$, $p < .001$, $\eta_p^2 = .19$). For the Regret condition, the endowment effect was eliminated ($M_{WTA} = 2.19$, $SD = 1.04$; $M_{WTP} = 2.09$, $SD = 0.90$; $F(1, 186) = 0.11$, ns). Finally, for the Disappointment condition, the endowment effect was reversed ($M_{WTA} = 1.73$, $SD = 1.33$; $M_{WTP} = 2.32$, $SD = 0.89$; $F(1, 186) = 4.27$, $p < .05$, $\eta_p^2 = .02$).

3. General discussion

We started our research with the question whether regret and disappointment could exert a different influence on the endowment effect. The results of a real market experiment on trading mugs (cf. [Kahneman et al., 1990](#)) and a pilot study on trading lottery tickets (cf. [Van de Ven et al., 2005](#)) supported our expectations that regret cancels the endowment effect and disappointment reverses it. These facts are in line with previous research that reported that emotions may impact the occurrence and direction of the endowment effect ([Lerner et al., 2004](#); [Lin et al., 2006](#)).

At this point, it may be worthwhile to discuss the broader consequences of our findings. [Pierce, Kostova, and Dirks \(2003\)](#) argued that the existence of psychological ownership can be explained by three intra-individual functions – efficacy and effectance, self-identity, and the need for having a place – that are served by this state and are, consequently, among the reasons for an individual to experience it. Identifying these functions is crucial to fully understand the processes through which psychological ownership emerges. According to [Morewedge et al. \(2009\)](#), ownership – and not loss aversion – causes the endowment effect. In addition, as noted by [Beggan \(1992, p. 233\)](#), “the mere ownership effect is a self enhancement bias directed towards one’s possessions”. Our data strongly suggest that emotions may moderate the tendency for people to over-value what they own.

Our findings are relevant for research on emotion as well. According to the emotion congruency model (ECM), the evaluation of objects is negatively influenced by negative emotion and positively influenced by positive emotions ([Iness-Ker & Niedenthal, 2002](#); [Rusting, 1998](#)). Consequently, if an object is associated with negative emotions, people will project those emotions onto the object, becoming more prone to accept losses, thus canceling (or even reversing) the endowment effect. Hence, a careful study of the involved (negative) emotions is needed in order to accurately predict their effects regarding object possession. Such a study would further our knowledge concerning the specific behavioral effects of different emotions.

However, as the endowment effect is more pronounced for goods that are easy to associate with the self, such as mug with an insignia ([Tom, 2004](#)), we are more inclined to the ownership account to explain its occurrence (cf. [Morewedge et al., 2009](#)). Induced negative moods may reverse the nature of possessions, turning a “good” object into a “bad” object, resulting in lower selling prices. In this case, we are dealing with a possession loss but a valence gain (cf. [Brenner, Rottenstreich, Sood, & Bilgin, 2007](#)). Conversely, the same negative moods may increase the attractiveness of non-possessed objects, resulting in higher buying prices. Thus, a person’s affective state, even unrelated to the subsequent object valuation, influences the assessments of possessed and non-possessed items.

In sum, by reporting distinctive behavioral consequences between regret and disappointment in object valuation, this research contributed to disentangle the mechanisms associated to emotion and the endowment effect. We believe more research is needed in order to shed more light into the emotion moderation effects on the endowment effect.

¹ An analysis that excluded the control condition, also showed a Seller/Buyer \times Emotion interaction, $F(1, 127) = 3.40$, $p < .07$, $\eta_p^2 = .03$

² We opted for simple effects analysis (cf. [Lerner et al., 2004](#)) because we had clear predictions and a significant interaction effect. We do want to note that rerunning the analysis with LSD post hoc tests revealed primarily the same results, as the difference in the Disappointment condition remained significant ($p < .05$).

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Appendix A

Instructions to participants:

A.1. Part I – Autobiographical recall

Please recall and describe your TYPICAL DAY [an important situation when you felt REGRETFUL/an important situation when you felt DISAPPOINTED]. Please try to remember it carefully and describe it with as much detail as possible. Write vividly.

A.2. Part II – Coffee mug market [selling vs. buying condition]

You have [do not have] a coffee mug. You now have the possibility to sell [buy] it. Please note that these decisions are binding. For each of the possible prices below, please indicate if you: (1) will sell [buy] the coffee mug, or (2) will not sell [buy] the coffee mug. Once you are done, one of the prices will be selected at random and mugs will be traded at that price.

If you indicated that you want to sell [buy] for that price, you get [pay] the money and deliver [get] in your [a] mug. If you have indicated that for that price you do not want to sell [buy], nothing happens (you get no money and keep your mug [you pay no money and get no mug]).

Please note:

- (1) Your choices will not affect the selling price (this is randomly determined).
- (2) It is in your best interest to determine how much the mug is worth to you.

Enter now for any price (with an X) your decision to sell [buy] the mug or not.

A.3. Part III

Please reread your Part I essay and indicate, using a 9-point scale, the intensity with which you felt the following emotions (1 = not at all; 9 = extremely):

Regret	①	②	③	④	⑤	⑥	⑦	⑧	⑨
Disappointment	①	②	③	④	⑤	⑥	⑦	⑧	⑨
Guilt	①	②	③	④	⑤	⑥	⑦	⑧	⑨
Shame	①	②	③	④	⑤	⑥	⑦	⑧	⑨
Anger	①	②	③	④	⑤	⑥	⑦	⑧	⑨
Sadness	①	②	③	④	⑤	⑥	⑦	⑧	⑨
Frustration	①	②	③	④	⑤	⑥	⑦	⑧	⑨
Envy	①	②	③	④	⑤	⑥	⑦	⑧	⑨
Fear	①	②	③	④	⑤	⑥	⑦	⑧	⑨

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