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The Regret Elements Scale: Distinguishing the affective and cognitive components of regret

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Abstract

Regret is one of the most common emotions, but researchers generally measure it in an ad-hoc, unvalidated fashion. Three studies outline the construction and validation of the Regret Elements Scale (RES), which distinguishes between an affective component of regret, associated with maladaptive affective outcomes, and a cognitive component of regret, associated with functional preparatory outcomes. The present research demonstrates the RES's relationship with distress (Study 1), appraisals of emotions (Study 2), and existing measures of regret (Study 3). We further demonstrate the RES's ability to differentiate regret from other negative emotions (Study 2) and related traits (Study 3). The scale provides both a new theoretical perspective on regret, and a tool for researchers interested in measuring post-decisional regret.

Keywords: emotion, regret, measurement, decision-making

1 Introduction

Individuals often reflect on past outcomes and wish they had done something differently. Regret, the negative emotion driven by these self-focused thoughts of "what might have been" (Gilovich & Medvec, 1995), permeates daily life (Shimanoff, 1984). Regret shapes multiple aspects of decision processes, from avoidance of the decision to shifting responsibility for the decision to reframing decision alternatives (Zeelenberg & Pieters, 2007), and it motivates information search about decision alternatives (Shani & Zeelenberg, 2007; Summerville, 2011b) and motivates choice switching (Marcatto, Cosulich & Ferrante, 2015). This complex emotion can, however, have seemingly paradoxical consequences: it can help productively guide thoughts and behavior (Smallman & Roese, 2009; Zeelenberg & Pieters, 2007), but can also lead to decision avoidance (Zeelenberg & Pieters, 2007).

We suggest that these divergent outcomes occur in part because regret has two distinct components: the affective experience produced by the negative event and the cognitive understanding of the poor decision (Gilovich & Medvec, 1995). Conceptualizing regret as consisting of two distinct elements offers a more nuanced understanding of the complexities of this emotion, and provides insight into the mechanisms underlying the varied antecedents and consequences of regret.

We therefore develop and validate a new measure of post-decisional regret, the Regret Elements Scale (RES). By understanding regret as a construct composed of two components, researchers can examine the consequences of regret with more precision. Other measures measure these components idiosyncratically and thus may emphasize them differently. For example, although the RDS (Marcatto & Ferrante, 2008) includes distinct items focused on affect and on counterfactuals, the scale as a whole is intended to distinguish between regret and disappointment, and it contains only two items specific to regret alone, both of which focus on the cognitive component. (The item measuring affect intensity is conceptualized to apply to both regret and disappointment.) The PPCR scale (Lee & Cotte, 2009) is specifically focused on regret, but it is designed to address consumer regret, and it focuses more on the cognitive element of regret than the affective component.

1.1 Two components of regret

The psychological constructionist model of emotion (Barrett, 2006; Russell, 2003; Russell & Barrett, 1999) conceptualizes emotions as involving a diffuse state of core affect characterized by a generalized experience of feeling good

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or bad, coupled with a specific cognitive attribution about the cause of that affective state.[1] Following that framework of emotion being a combination of affect and cognition, the emotion of regret can be defined as encompassing both negative affect and a counterfactual thought (Gilovich & Medvec, 1994). These thoughts of "what might have been" compare an actual outcome to a hypothetical outcome (Roese, 1997). Counterfactual thoughts can focus on a situation that could have been worse (downward counterfactual) or a situation that could have been better (upward counterfactual). When an upward counterfactual thought focused on the causal role of the self results in negative affect, regret arises (Gilovich & Medvec, 1995). For any given experience of regret, a person therefore must both experience negative affect while also thinking about how the situation could have turned out better if person's had chosen differently.

Although both affect and cognition are critical components of regret (Roese et al., 2009; Zeelenberg et al.,1998) the strength of each component can vary across experiences of the emotion. Regrets can differ in how "hot", or affectively laden, they feel (Gilovich, Medvec & Kahneman, 1998). Furthermore, counterfactual thoughts can be more or less prominent depending on the given situation (Kahneman & Miller, 1986). Because actual emotional experience varies in how closely it corresponds to a fully prototypical experience (Russell, 2003), the relative salience or centrality of the affective and cognitive elements in any given actual experience of regret will vary. That is, some experiences of regret may have a particularly strong affective impact, and some may have particularly salient counterfactual thoughts. The current research thus tests the following primary hypothesis.

Hypothesis 1 (H1): Cognitive and affective components of regret are distinct dimensions.

1.2 Affect and cognition in emotional experience

The joint role of both affect and cognition in emotional experience is not unique to regret. Cognitive appraisal theory posits that different emotional experiences are uniquely characterized by, hence distinguished by, different cognitions (Smith & Ellsworth, 1985; Frijda, 1988; Frijda, Kuipers & ter Schure, 1989; Niedenthal, Tangney & Gavanski, 1994). Regret and disappointment are associated with comparisons to how things could have been different, but regret concerns how a different choice could have led to a better outcome and disappointment concerns how an external event out of one's control could have done so (Zeelenberg et al., 1998). Regret and guilt differ in that guilt is specific to violation of personal standards, social rules, or moral principles while regret is more general. One might feel regret but not guilt in an instance where things could have been better, but one's principles weren't compromised by the failed outcome. For instance, an individual who neglects to check the forecast might regret not having brought an umbrella, but generally wouldn't feel guilty. In contrast, regret and disappointment differ on the basis of the counterfactual being made. One might regret forgetting to buy a birthday present for a friend until it was too late to arrive on time ("if only I had shopped sooner. . . "), but feel disappointed that the shipment was delayed so that the present arrived late ("if only the shipping service was more reliable. . . ").

Given that distinct emotions are distinguished by distinct patterns of appraisals, we offer a necessary requirement for any measure of regret:

Requirement 1 (R1): The measure will be related to appraisals characteristic of regret and not other emotions.

That is, the measure should be positively correlated with appraisal ratings that are have established positive associations with regret, negatively correlated with appraisal ratings that have established negative associations with regret, and uncorrelated with appraisal ratings unrelated to regret. Moreover, the number of these dimensions that regret matches should be greater than the number of matches to the appraisals to other emotions.

1.3 Regret in decision process and strategic behavior

Regret plays a complex and even contradictory role in decision-making and strategic behavior. At times, regret seems detrimental to these processes. Excessive concern with past experiences of regret (Ratner & Herbst, 2005) or the future possibility of experiencing regret (Reb & Connolly, 2009) can result in sub-optimal decision-making. Furthermore, regret compromises subsequent decision-making in contexts such as negotiations (Larrick & Boles, 1995), choice (Marcatto et al., 2015), and receptiveness to feedback (Reb & Connolly, 2009). However, regret can also play a beneficial role in decision-making. Experiences of regret encourage thoughtful and thorough decision-making as well as the generation of behavioral intentions about the future (Tsiros & Mittal, 2000; Reb, 2008). People are more likely to recognize and remedy poor decisions from the past after experiencing regret (Zeelenberg, 1999; Zeelenberg, Inman & Pieters, 2001). Indeed, the continued experience of regret depends on the opportunity for future related decisions (Summerville, 2011a).

[1] Other emotion theorists have offered competing frameworks of emotion that are beyond the scope of this paper to address. The current research is not intended to test competing models of emotion, so in relying on the psychological constructionist model, we are concerned only with its utility in understanding regret and its consequences.

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We suggest that understanding regret as an emotion that encompasses both affective and cognitive components offers new clarity about the role of regret in decision-making. The ability to reliably measure these components separately would thus offer a new tool to researchers interested in post-decision processes and outcomes.

1.4 The link between components and consequences of regret

Regret can lead to a variety of negative outcomes both within and beyond decision-making. Most proximally, increased regret is associated with negative mental health outcomes including greater anxious arousal, depression, and general distress (Roese et al., 2009). As a more distal outcome, concern about feeling regret in the future can encourage sub-optimal choice strategies and reduce the desire to receive possibly helpful feedback (Reb & Connolly, 2009), and can also lead to less successful negotiations between parties (Larrick & Boles, 1995). More broadly, focusing on the negative affective reaction to a poor decision encourages people to switch away from previously effective decision-making strategies (Ratner & Herbst, 2005). Regret has also been linked to lower levels of well-being (Torges, Stewart & Nolen-Hoeksems, 2008), life satisfaction (Lecci, Okun & Karoly, 1994), and reduced quality of life (Wrosch, Bauer & Scheier, 2005). Because it appears that many of these negative consequences relate to emotional reactions to decisions and concern affective states such as anxiety, sadness, or stress, we posit the following secondary hypothesis.

Hypothesis 2A (H2A): The affective element of regret is positively associated with emotional distress.

Research has also demonstrated that regret can lead to positive outcomes. Regret encourages corrective action (Zeelenberg, 1999) such as generating intentions for future behaviors (Tsiros & Mittal, 2000) or switching service providers after a bad experience (Zeelenberg & Pieters, 1999; Zeelenberg, Inman & Pieters, 2001). Regret persists when there is opportunity in the future to attain relevant goals (Roese & Summerville, 2005; Summerville, 2011a). Furthermore, anticipated regret can encourage careful and thorough decision-making (Reb, 2008). The positive consequences of regret thus appear to center on cognitions about decision-making and the ability to use these inferences to improve future decisions about ongoing goals. This leads to the following secondary hypothesis.

Hypothesis 2B (H2B): The cognitive element of regret is positively associated with related task performance.

1.5 Overview of the present studies

Across three studies, the current research outlines a conceptualization of regret as consisting of two separable affective and cognitive elements, develops a measure of post-decisional regret, the Regret Elements Scale (RES), and tests the above hypotheses. Study 1 outlines the creation of a scale consisting of two 5-item subscales and examines the convergent relationships of the subscales (Hypothesis 1); it also examines the predictive validity of the emotion component in predicting emotional distress (Hypothesis 2A). Study 2 tests the validity of the scale as a measure of regret within the context of cognitive appraisal theory, examining how the RES converges with established characteristics of regret, thus examining whether the scale satisfies Requirement 1 (i.e., any regret scale should be consistent with the typical appraisal pattern of regret). Finally, Study 3 examines its relationships to conceptually similar and dissimilar constructs, thus providing evidence of both convergent and divergent validity.

2 Study 1

We initially examined how people understand and characterize experiences of regret by asking people to respond to 50 items assessing post-decisional regret after thinking about a regrettable situation from their past (see Preliminary Study in Supplemental Materials). This allowed us to create a 10-item scale containing 5 items measuring the affective element and 5 items measuring the cognitive element. The primary goal of Study 1 was to assess the fit of the hypothesized two-factor structure of the final version of the scale, and thus provide a replication of the test of Hypothesis 1 that cognitive and affective components of regret will emerge as distinct dimensions. We utilized structural equation modeling (SEM) to test the fit of the reduced 10-item scale predicting two elements of regret against two alternative models: the original 16-item model predicting the two elements of regret, and a model with the 10 items predicting a single construct of regret.

Additionally, we assessed the predictive relationship of the affective subscale to an established measure of emotional distress (Hypothesis 2A). Specifically, we examined whether the affective subscale would predict scores on the Mood and Anxiety Symptom Questionnaire (MASQ; Watson & Clark, 1991). The MASQ is a widely used scale to measure state mood and anxiety (e.g., "I feel tense or high strung" or "I feel uneasy"). Because previous research has raised concerns about the anxious arousal and anhedonic depression subscales of the MASQ (Buckby, Yung, Cosgrave & Killackey, 2007), we examined relationships only with the general distress subscale. If a connection exists between the general distress subscale of the MASQ and the affective but not cognitive element of the RES, it would provide

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evidence supporting our claim that the affective element is uniquely related to emotional outcomes, and more generally support the distinctiveness of these two components of regret. However, given the non-orthogonality of the subscales, we did not predict that the correlations between each subscale and general distress would necessarily differ from one another significantly. Furthermore, because the MASQ is a trait-level measure, we expected only modest correlations with the state-level RES, which measures only regret about a single, narrowly circumscribed incident.

2.1 Method

One hundred eighty introductory psychology students (125 female) at a university in the Midwestern United States participated in partial fulfillment of a course requirement. This sample size is consistent with recommendations for a sample size of at least 10 times the number of free model parameters (Hu, Bentler & Kano, 1992). Each participant completed the tasks on a personal computer in an individual cubicle. Participants were given a prompt to write about a regrettable situation (Roese & Summerville, 2005; see Appendix). Participants then rated each of 16 items (9 affective and 7 cognitive) in relation to the regrettable situation they had just described on a 7-point Likert scale (1 = Strongly Disagree, 7 = Strongly Agree). After rating the scale items, participants completed the general distress subscale from the MASQ (Watson & Clark, 1991), along with other unrelated items relevant to the fourth author's undergraduate honors thesis.

2.2 Results

We first reduced the 16-item set to a 10-item scale (Table 1) composed of two 5-item subscales (see the Supplemental Materials for details on this reduction process).

2.2.1 Model comparison

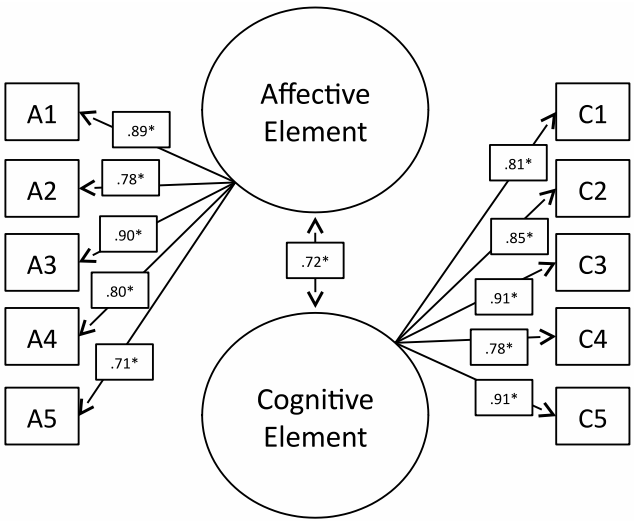
We next used structural equation modeling to assess the fit of the reduced 10-item model (Figure 1). Because most existing measures treat regret as a single construct, we wanted to ask whether our two-factor conceptualization of regret was a better fit to the data than a single-factor model. We predicted that the 10-item, two factor model would have the best fit to the data, supporting the utility of the reduced 10-item scale and the conceptual soundness of the two-subscale structure.

To analyze the hypothesized models we used Mplus v.5.21 statistical software (Muthén & Muthén, 2009). Maximum likelihood (ML) was used for all parameter estimation. The goodness of fit for each model was tested using multiple indices: chi-square statistic, Comparative Fit Index (CFI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR). For

Table 1: Regret Elements Scale (RES) Items.

Item
I am experiencing self-blame about the way I made my decision (A1)
I feel sorry (A2)
I am experiencing self-blame (A3)
I feel guilty (A4)
I feel like kicking myself (A5)
Things would have gone better if I had chosen another option (C1)
I wish I had made a different decision (C2)
I should have decided differently (C3)
I would have been better off had I decided differently (C4)
Before I should have chosen differently (C5)

Figure 1: Two factors and 10 items. The affective element and cognitive element are the two factors (latent variables), predicted by the reduced 10-item set. The factors' intercorrelation is shown in between the two factors. * $p < .01$.



the chi-square statistic, we considered a value within plus or minus two degrees of freedom and a non-significant statistic at the $p = .05$ level indicative of good fit. For the other fit indices, values equal to or greater than .97 for the CFI and values equal to or less than .06 for the RMSEA and SRMR were considered indicative of good fit (Hu & Bentler, 1999; Schermelleh-Engel, Moosbrugger & Müller, 2003).

We first examined the fit of the model in which the reduced 10-item scale measured two correlated latent constructs (Figure 1). Overall, goodness of fit indices suggested acceptable to good fit for three of the four indices: χ^2 (34) =

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89.30, $p < .05$; CFI = 0.96; RMSEA = 0.10; SRMR = 0.03. Finally, we examined the single-factor model. Goodness of fit indices suggested a poor fit for the single-factor model for all but one of the indices: $\chi^2(35) = 334.58$, $p < .05$; CFI = 0.79; RMSEA = 0.22; SRMR = 0.09. Chi-square differences between models further indicated that the 10-item model fit significantly better than the single-factor model, χ^2 (1) = 245.28, $p < .001$. Our hypothesized model for the two 5-item subscales of the RES thus offers superior fit relative to alternative models.

Additionally, we examined whether the scale showed measurement invariance across gender to ensure that the scale could be used to make comparisons between genders. We first fit a model separately estimating the parameters within each gender, and then compared this unrestricted model to a restricted model in which both genders were constrained to have identical factor loadings and intercepts. This comparison revealed a non-significant difference in the chi-square statistic, $\Delta\chi^2(10) = 5.54$, $p = .85$, indicating measurement invariance across gender.

2.2.2 Predictive validity

We related each subscale to ratings on the general distress subscale of the MASQ. As predicted by Hypothesis 2A, the affective subscale had a significant positive relationship with the general distress subscale of the MASQ, $r = .17$, $p = .02$. Conversely, and as expected, the cognitive subscale was unrelated to feelings of general distress ($r = .07$, $p = .32$); these correlations were almost significantly different by a test to compare dependent correlations ($p = .051$, one tailed, given the correlation of .67 between the affective and cognitive subscales).

We also created single-item measures of each element of regret and assessed their relationship to the general distress subscale of the These items were selected based on the strength of their factor loading onto each latent variable. Although the single affective item (A3: "I am experiencing self-blame"), unlike the subscale, was only weakly related to general distress ($r = .14$), the single cognitive item (C3: "I should have decided differently"), similar to the subscale, was unrelated to general distress ($r = .03$).

2.3 Discussion

Study 1 utilized structural equation modeling to reduce the scale from 16 to 10 items, with five items assessing the affective element of regret and five items assessing the cognitive element of regret. We then compared the fit of this hypothesized model to an alternative model in which the larger set of items was retained and a model in which all ten items predicted a single latent construct. Whereas both the 16-item model and the single construct model did not fit the data well, the hypothesized model had a significantly better and generally good fit to the data, consistent with Hypothesis 1. We therefore retained the hypothesized 10-item scale as the final form of the RES.

Furthermore, to test Hypothesis 2A, we examined the relationship of each of the five-item subscales to an established measure of emotional distress. As expected, the affective subscale was predictive of general distress whereas the cognitive subscale was unrelated. These findings provide initial evidence of the RES's ability to distinguish between the affective and cognitive components of regret as well as their differential consequences.

3 Study 2

Although the original 16 items of the RES were designed to assess regret, items such as "I feel ashamed" or "I feel guilty" suggest that the scale could also be measuring shame, guilt, or a non-specific negative affective reaction. Indeed, the initial pool of items assessed both regret and disappointment given the possibility that participants might not make nuanced distinctions in the language they use to describe a regrettable experience. Because different emotional experiences can have different influences on decision-making (Zeelenberg et al., 1998; Zeelenberg & Pieters, 1999), it is important to ensure that the RES specifically assesses feelings of regret. For that reason, Study 2 examined whether the 10-item RES is consistent with established appraisal patterns for regret and not for other negative emotions (Requirement 1). In so doing, Study 2 provides evidence on convergent and discriminant validity of the RES.

Appraisals represent a cognitive understanding of a situation, and reliably differ between specific emotions (Smith & Ellsworth, 1985; Frijda, 1988; Frijda, Kuipers & ter Schure, 1989). Two similar emotions can be distinguished by examining these appraisals. For instance, sadness and sorrow are similar emotions but differ in whether or not the self is seen as a causal agent (Frijda, Kuipers & ter Schure, 1989). In particular, we focused on nine specific appraisals identified by Tong (2010): appraising the situation as pleasant, as being controlled by the individual or the circumstances, as predictable, that obstacles were faced during the situation, as fair, as the individual or others being responsible for the situation, and that the individual exerted effort during the situation. Past work has demonstrated that regret is characterized by appraising the situation as unpleasant, feeling responsible for the negative outcome, feeling that the situation was controllable (van Dijk & Zeelenberg, 2002), and believing that one exerted effort in the situation (Frijda et al., 1989). We expected the RES to follow this pattern of correlations.

Additionally, we expected that to the extent that individuals believed their own decisions were central to the outcome, as expressed through the cognitive component of regret, they

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Table 2: Study 2: Cognitive appraisals characteristic of negative emotions. Columns refer to the nine appraisal dimensions. Cells containing "+" indicate that a positive relationship between the emotion in the left-most column and that appraisal was found by Tong (2010), Frijda et al. (1989), and/or van Dijk & Zeelenberg (2002); "-" connotes that a negative relationship was found by those authors; empty cells signify no relationship was obtained by those authors. The bottom two rows present zero-order correlations of the nine appraisal dimensions with the RES subscales in Study 2. * $p < .01$.

	Predicted Relationships								
	Pleasant	Controlled by self	Controlled by circumstances	Predictable	Obstacles encountered	Fairness	Self responsible	Others responsible	Effortful
Anger	-				+	-		+	+
Sadness	-	-	+		+	-			+
Fear	-	-	+	-	+	-			+
Guilt	-				+	-	+	-	
Regret	-	+					+		+
	Obtained Correlations								
Affective	–.44*	.21	–.08	–.01	.19	.19	.45*	–.01	.34*
Cognitive	–.44*	.36*	–.14	.06	.09	.36*	.49*	.02	.45*

should see the self as more highly causal and others as less so. This also means that they would be less likely to see the situation as having been unfairly controlled by an outside agent. Due to the focus on the decision-making process, we thus believed that appraising the situation as controlled by self and fair would be correlated with the cognitive subscale but might be unrelated to the affective subscale.

Further, Study 2 distinguished the RES from other negative decision-based emotions, specifically anger, sadness, fear, and guilt. Tong (2010) identified characteristic appraisal dimensions for these negative emotions (see top portion of Table 2 for a schematic of these appraisals for each emotion). We expected that the RES would show a stronger relationship to dimensions associated with regret (van Dijk & Zeelenberg, 2002) than to dimensions associated with negative emotions other than regret, indicating the discriminant validity of the measure.

3.1 Method

Sixty-three introductory psychology students at a university in the Midwestern United States participated in partial fulfillment of a course requirement. Each participant completed the tasks on a personal computer in an individual cubicle. Participants first wrote about "a past situation where a decision you made turned out badly. Think about a time when a choice you made resulted in negative consequences for you and/or someone else."

Participants then rated this situation using 7-point scales with anchors "Strongly Disagree" and "Strongly Agree." Items within each of the two rating blocks were randomized. In the first block, participants completed the RES (Affective subscale (RES-A): α = .87; Cognitive subscale (RES-C): α = .89). In the second block, participants rated 9 appraisal dimensions from Tong (2010): how pleasant the situation was, how responsible they or others were for the situation, how much the situation was controlled by themselves or the circumstances, how predictable and fair the situation was, and whether or not they exerted effort or faced obstacles

3.2 Results

We first examined the relationships between the RES and the appraisal dimensions (Table 2). As predicted, both components had positive relationships with feeling responsible for the negative outcome, exerting effort during the situation, and appraising the situation as unpleasant. Additionally, as predicted, the cognitive element was positively related to appraising the situation as controlled by the self. The affective subscale was not related to this appraisal, and the difference between the two correlations was significant ($p = .044$, one tailed). The cognitive element of regret was also significantly related to appraising the situation as fair. The affective element was not significantly related to this appraisal, and these correlations were also significantly different from each other ($p = .041$, one tailed). No other appraisal dimensions had significant relationships with the affective subscale or the cognitive subscale (all $r < .20$, $p > .10$).

We next compared previously established appraisal patterns of other negative emotions to the appraisal pattern associated with the RES. In order to assess which emotion was

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best represented by the RES, we compared correlations between the RES and each appraisal dimension to both the pattern of appraisals for negative emotions established by Tong (2010), and the pattern of appraisals established for experiences of regret by Frijda and colleagues (1989) and van Dijk and Zeelenberg (2002). For the RES to be best representative of an emotion, it should satisfy three criteria. First, the RES should correlate positively with an appraisal dimension when the specific emotion has an established positive relationship with the appraisal dimension. Second, the RES should correlate negatively with a dimension when the specific emotion has an established negative relationship with the dimension. Finally, the RES should not correlate with a dimension when the specific emotion has no established relationship with the dimension. Each of these outcomes thus represents a "match" to the pattern of correlations expected for a given emotion. We tested these predictions by assuming an equal probability of a positive, null, or negative relationship (in terms of statistical significance) and testing the binomial probability of the number of matches when the probability of a success was 33%.

As demonstrated in Table 2, the pattern of appraisals exhibited by the RES did not match the pattern of appraisals that Tong (2010) suggest represent anger, sadness, fear, or guilt. Specifically, the RES-A matched only 55% of anger appraisals, 33% of fear appraisals, and 55% of guilt appraisals. The RES-C matched only 44% of anger appraisals, 44% of sadness appraisals, 33% of fear appraisals, and 44% of guilt appraisals. However, the pattern of appraisals exhibited by the RES-C matched 89% of the appraisals that Frijda and colleagues (1989) and van Dijk and Zeelenberg (2002) suggest represent regret, and the RES-A matched 78% of regret appraisals.

Critically, given the emphasis on the causal role of the self in the definition of regret (Gilovich & Medvec, 1995), both subscales had a positive relationship with the appraisal of how much the individual was responsible for the situation, and of how much the individual was in control of the situation for the cognitive subscale only. This pattern of appraisals was not characteristic of any of the other emotions, indicating the discriminant validity of the RES.

Additionally, the single-item measures of the elements of regret behaved in a similar manner as their equivalent 5-item subscale. That is, the affective item was correlated with feeling responsible for the negative outcome (r = .49, p < .001), exerting effort during the situation (r = .38, p < .01), and appraising the situation as unpleasant (r = .37, p < .01), However, this single-item measure was also correlated with appraising the situation as being controlled by the self (r = .26, p = .04), unlike the 5-item subscale. The cognitive item mirrored the 5-item subscale exactly. It was correlated with feeling responsible for the negative outcome (r = .44, p < .001), exerting effort during the situation (r = .32, p = .01), appraising the situation as unpleasant (r = .45, p < .001), appraising the situation as being controlled by the self (r = .34, p < .01), and appraising the situation as fair (r = .33, p < .01).

3.3 Discussion

Study 2 examined the convergence of the RES with established characteristics of regret. In line with past research, both subscales had a significant relationship with appraisal dimensions related to regret (Frijda et al., 1989; van Dijk & Zeelenberg, 2002). Additionally, the pattern of appraisals associated with each subscale differed from the pattern of appraisals associated with other negative emotions (Tong, 2010). These combined findings suggest that the RES measures regret and not emotions such as anger, fear, shame and guilt, nor a more global negative reaction to adverse outcomes of decisions. Thus, Study 2 provides support for the convergent and discriminant validity of the RES, and establishes that it meets R1 that the measure will correspond to the pattern of appraisals characteristic of regret and not other emotions.

Examining the two subscales separately offered new insight into the nature of regret. The cognitive component, but not the affective component, was related to appraising the situation as fair and as being under one's control. These appraisals can be considered an adaptive response to regret. Interpreting a prior decision as fair and under one's control indicates acknowledgement of the opportunity to make the correct decision, but not taking it. This understanding thus allows the individual to learn from past mistakes and make better decisions in the future (Zeelenberg, 1999). In contrast, the affective component was unrelated to these appraisals. This component alone may result in individuals being less likely to draw causal inferences or learn from past failures, contributing to its negative consequences.

4 Study 3

Although Study 2 demonstrated that the RES measures the emotion of regret, it is unclear how this scale compares to existing measures of regret. Study 3 therefore examined how the RES related to two existing measures of regret: the state-level Regret and Disappointment Scale (RDS; Marcatto & Ferrante, 2008) and a trait-level measure of Regret Proneness (RP; Schwartz et al., 2002). We predicted that the RES would be positively related to the Regret Index of the RDS and unrelated to the Disappointment Index of the RDS. We also anticipated that the RES would be only modestly related to trait-level RP (Schwartz et al., 2002) as the RES is a state-level measure of regret that largely emphasizes the frequency with which an individual feels regret. We anticipate that even people who feel regret infrequently may be able to recall a single instance in which they felt relatively strong

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regret, and that regret proneness thus would not necessarily predict the amount of regret in a single instance.

Additionally, we examined how the RES related to several other constructs in the emotion and decision-making construct space, including need for cognition, faith in intuition, and neuroticism. We predicted that the RES would be unrelated to these constructs as they are conceptually distinct from the experience of regret.

4.1 Method

4.1.1 Participants

Eighty-four participants were recruited online via Amazon's Mechanical Turk worker pool (http://www.mturk.com) and paid for their participation. Because of institutional regulations, participation was limited to US workers only. Six participants who did not correctly follow instructions were removed from all analyses, leaving a final sample of 82.

4.1.2 Measures

All measures used a 7-point (1–7) scale ranging from "Strongly Disagree" to "Strongly Agree".

Regret measures. Participants completed the Regret and Disappointment Scale (RDS) (7 items; Marcatto & Ferrante, 2008). An example item is, "I wish I had made a different choice." Participants also completed the trait-level measure of regret proneness (5 items; $\alpha = .73$; Schwartz et al., 2002). An example item is, "Whenever I make a choice, I'm curious about what would have happened if I had chosen differently."

Discriminant constructs. To establish the discriminant validity of the RES-C from other cognition-related constructs, participants completed the Need for Cognition Scale (5 items; $\alpha = .89$; Cacioppo & Petty, 1982; example item: "I prefer complex to simple problems"). To distinguish the RES-A from other constructs relating emotional experience to decision-making, participants completed the Faith in Intuition Scale (5 items; $\alpha = .94$; Epstein, Pacini, Denes-Raj & Heier, 1996; example item: "I believe in trusting my hunches"). To establish that RES-A was distinct from general negative emotionality, participants completed the Neuroticism subscale from the NEO Five-Factor Inventory (13 items; $\alpha = .85$; Costa & McCrae, 1992; example item: "In general, I am anxious").

4.1.3 Procedure

Participants were given a prompt to think and write about a negative decision from their past similar to that used in Study 2. After spending at least one minute thinking and writing about the situation, participants completed the RES (Affective subscale: $\alpha = .84$; Cognitive subscale: $\alpha = .94$), followed by the RDS, and then regret proneness. The order of items within each scale was randomized. Participants then completed measures of need for cognition, faith in intuition, and neuroticism, presented in random order, with the order of items within scale randomized. Participants were debriefed and thanked for their time.

Table 3: Study 3: Correlations between Regret Elements Scale and other measures.

	Affective component	Cognitive component
Regret index	.63*	.79*
Disappointment index	.13	.01
Trait-Level regret	.08	.12
Need for Cognition	−.11	−.12
Faith in Intuition	.11	.10
Neuroticism	.12	−.02

Note: Zero-order correlations between the questionnaires measured in Study 3 and the RES. * $p < .01$.

4.2 Results

4.2.1 Regret measures

We first examined how the RES related to the existing measures of regret (see Table 3). As predicted, both subscales had a positive relationship with the Regret Index from the RDS ($rs > 0.63$, $ps < .001$) and were unrelated to the Disappointment Index ($rs < 0.13$, $ps > .26$). The state-level RES was unrelated to trait-level regret proneness, $rs < 0.12$, $ps > .29$.

4.2.2 Discriminant constructs

We next examined the relationships between the RES and the other constructs. As was expected, both subscales were unrelated to need for cognition ($rs < 0.13$, $ps > .25$), faith in intuition ($rs < 0.12$, $ps > .29$), and neuroticism ($rs < 0.12$, $ps > .30$).

4.2.3 Single-item measures

Once again, the single-item measures of each element had the same relationships with the other constructs as the 5-item subscales. The affective item was significantly correlated with the Regret Index from the RDS ($r = .63$, $p < .001$), but none of the other constructs ($rs < .16$, $ps > .16$). Similarly, the cognitive item was significantly related to the Regret Index from the RDS ($r = .69$, $p < .001$), but not the other constructs ($rs < .16$, $ps > .14$).

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4.3 Discussion

Study 3 highlights the nuanced understanding of regret provided by the RES. The state-level RES was related to another state-level measure of post-decisional regret (Marcatto & Ferrante, 2008) but unrelated to a trait-level measure of Regret Proneness (Schwartz et al., 2002). This lack of correlation may stem from the fact that we measured a single situation for each participant. If instead we had participants complete the RES as a daily diary or experience sampling procedure, we believe it is more likely that those scores would be related to regret proneness (i.e., that across all daily situations, regret prone people feel more regret). Furthermore, demonstrating discriminant validity for the scale, the RES was unrelated to the constructs of disappointment, need for cognition, faith in intuition, and neuroticism.

5 General discussion

In three studies, we provided evidence in support of the two-component conceptualization of regret, and developed and validated the Regret Elements Scale (RES). We specifically tested and confirmed three hypotheses. Supporting Hypothesis 1, through the use of confirmatory factor analysis (Study 1), we established the affective and cognitive elements as two related but distinct components of regret. In Study 2, we demonstrated the construct validity of the scale, as both of the elements of regret were consistent with appraisals characteristic of regret (Frijda et al., 1989; van Dijk & Zeelenberg, 2002), but not other negative emotions (Tong, 2010). In Study 3, the scale converged with another state-level measure of regret (Marcatto & Ferrante, 2008), but was unrelated to measures of regret proneness, disappointment, neuroticism, need for cognition, and faith in intuition. Furthermore, the two elements of the RES predicted different consequences of regret. As predicted by Hypothesis 2A, affective but not cognitive regret was related to negative mental health symptoms in Study 1. We also found support for Hypothesis 2B: in Study 2, the cognitive component predicted more functional aspects of regret, whereas the emotional component was unrelated to these functional aspects. The RES thus offers a new, validated, and reliable measure of post-decisional regret. In addition, the length of the scale allows for ease of use while still offering reliability and validity. Thus, the RES presents researchers with an alternative to the current practice of assessing state-level regret with ad hoc measures.

By distinguishing between the affective and cognitive components of regret, the RES offers researchers an opportunity to examine the underlying processes involved in the experience of regret. The distinction between the affective and cognitive elements clarifies the experience of regret, or how an individual is experiencing regret. This more nuanced perspective of regret allows researchers to better understand the broad range of responses to regret by distinguishing regret that may lead to affective distress from an experience of regret that fuels preparations for the future. In demonstrating that each subscale assesses different components of regret, we have not only provided researchers with a tool to better understand the experience of regret, but also have offered a perspective on the complexities of the emotion itself.

5.1 Usage of the RES

Although the two subscales of the RES were correlated in each of the studies reported here, the pattern of results for the aggregate scale were inconsistent and illustrate the importance of using the two subscales as distinct predictors. At times, it may not be problematic to aggregate the subscales: in Study 3, the RES-A, RES-C, and aggregate measure all had the same pattern of relationships to the criterion variables. However, at times using the overall RES would have masked distinct patterns of relationships for the RES-A versus RES-C. In Study 2, the total RES was related to appraisals of the situation as controlled by the self and as fair. However, the relationship between the aggregate RES and these appraisals were driven solely by the cognitive subscale; the affective subscale was unrelated to these appraisals. The aggregate RES would have thus missed the absent relationship between the RES-A and these appraisals. Overall, use of the subscales or the aggregate scale should be determined by theoretical factors. In most cases use of the subscales will probably more suitable; however, when researchers are explicitly interested in the combined, or total, effect of both cognitive and affective components, use of the aggregate scale may be more appropriate.

We also examined single-item versions of each subscales for situations when there are barriers to usage of a longer scale. Although the single item measures generally performed well, there are a number of caveats we would highlight in their use. In addition to the general concerns about single-item measurement (e.g., Gardner, Cummings, Dunham & Pierce, 1998; Nunnally, 1978; Oshagbemi, 1999), we would note that the single-item version of the affective subscale did correlate with an appraisal dimension to which the subscale as a whole was unrelated. Furthermore, the affective item focuses on self-blame. Although this is a central component of regret's emphasis on self-focused thoughts, researchers may have concerns about the face validity of the measure.

5.2 Future directions and limitations

The RES allows researchers to distinguish between two components of regret, which may lead to a better understanding of both the antecedents and consequences of experiences of regret. Although each subscale was able to differentially predict distinct consequences of regret, the two sub-

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scales were highly correlated with each other. Because the definition of regret contains both cognitive and emotional aspects (Gilovich & Medvec, 1995), it is likely that both the cognitive and affective components will be experienced conjointly. The fact that the scales allow separate measurement does not mean that the factors are fully orthogonal. Precisely how the two elements interact to produce outcomes should be examined in future research.

The RES could also help advance our understanding of individuals' regret regulation strategies, something the present studies did not focus on. Zeelenberg and Pieters (2007) distinguish between different methods of reducing the experience of regret, identifying feeling-, decision-, and alternative-focused strategies. Future research should examine whether the feeling-focused strategies may be best used to reduce the affective component of regret while the decision- and alternative-focused strategies may more effectively reduce the cognitive component.

Another direction for future work would be to adapt the RES to measure anticipated rather than experienced regret. Given that consumers frequently utilize anticipated regret when making purchasing decisions (McConnell et al., 2000; Zeelenberg, 1999), and often respond in problematic ways (e.g., delaying or avoiding a decision), this use of the RES might also help researchers and practitioners adapt the decision architecture to minimize maladaptive impacts of anticipated regret.

The present research established predictive validity of the RES-A only on a general measure of emotional distress, not a context-specific outcome. We also did not investigate many aspects of decision-making relevant to the RES-C. Furthermore, the current studies examined a single instance of recalled regret for each participant in each study. Future work is needed to test regret in vivo and to utilize within-participant measurement to reduce potential error variance.

Whereas we established the measurement invariance of the RES across genders, the current research did not assess cross-cultural invariance or validity. Although Study 3 used a more diverse (i.e., non-undergraduate) sample, it is worth noting that all samples were limited to the United States. Cross-cultural validity of a scale cannot simply be assumed. For example, research has shown cross-cultural differences in emotionality and goals (Matsumoto et al., 2008), as well as regret (Komiya, Watabe, Miyamoto & Kusumi, 2013) which may have implications for how respondents from different cultures respond to the RES.

Furthermore, we reiterate that the RES distinguishes between the affective and cognitive elements of regret, not functional and maladaptive consequences per se. While the majority of the consequences of the affective and cognitive elements appear to follow the pattern of beneficial and maladaptive outcomes, respectively, in some cases the opposite pattern may occur. Counterfactual thoughts may lead to ineffective learning strategies under certain conditions (Petrocelli & Harris, 2011), and may be misrepresented in memory as reality (Taylor, 1991; Garry & Polaschek, 2000; Petrocelli & Crysel, 2009). In these situations, the cognitive component of regret may lead to poorer performance on subsequent tasks. Furthermore, negative emotions, such as sadness, can facilitate cognitive processing, leading to greater attention to detail and less heuristic or stereotypic processing (Gasper & Clore, 2000; Bodenhausen, Sheppard & Kramer, 1994). The affective element of regret could have similar effects. It is thus inappropriate to conflate affective with maladaptive and cognitive with beneficial outcomes.

5.3 Conclusions

Regret, an emotion of "what could have been", permeates people's lives: when making decisions, we anticipate regret and try to avoid it; when receiving negative outcomes, we often experience regret; and when looking back at our lives, we take stock of our biggest regrets. The RES offers researchers the possibility to reliably measure two essential components of regret – affect and cognition — thus allowing a new opportunity for insight into the complex and at times conflicting role of regret in decision-making and well-being. Given the pervasive nature of regret and its ability to be a powerful force for both good and ill, we hope that this scale facilitates both better measurement as well as greater theoretical understanding of this important and complex emotion.

References

Barrett, L. F. (2006). Solving the emotion paradox: Categorization and the experience of emotion. *Personality and Social Psychology Review, 10,* 20–46.

Bodenhausen, G., Sheppard, L., & Kramer, G. (1994). Negative affect and social judgment: The different impact of anger and sadness. *European Journal of Social Psychology, 24,* 45–62.

Buckby, J. A., Yung, A. R., Cosgrave, E. M., & Killackey, E. J. (2007). Clinical utility of the Mood and Anxiety Symptoms Questionnaire (MASQ) in a sample of young help-seekers. *BMC Psychiatry, 7,* 50.

Cacioppo, J. T., & Petty, R. E. (1982). The need for cognition. *Journal of Personality and Social Psychology, 42,* 116–131.

Costa, P. T. Jr., & McCrae, R. R. (1992). *Revised NEO Personality Inventory (NEO-PI-R) and NEO Five-Factor Inventory (NEO-FFI) professional manual.* Odessa, FL: Psychological Assessment Resources.

Epstein, S., Pacini, R., Denes-Raj, V., & Heier, H. (1996). Individual differences in intuitive–experiential and analytical–rational thinking styles. *Journal of Personality and Social Psychology, 71,* 390–405.

https://doi.org/10.1017/S1930297500003107 Published online by Cambridge University Press

Frijda, N. H. (1988). The laws of emotion. *American Psychologist, 43,* 349–358.

Frijda, N. H., Kuipers, P., & ter Schure, E. (1989). Relations among emotion appraisal and emotional action readiness. *Journal of Personality and Social Psychology, 57,* 212–228.

Gardner, D. G., Cummings, L. L., Dunham, R. B., & Pierce, J. L. (1998). Single-item versus multiple item measurement scales: An empirical comparison. *Educational and Psychological Measurement, 58, 898–915.*

Garry, M., & Polaschek, D.L.L. (2000). Imagination and memory. *Current Directions in Psychological Science, 9,* 6–10.

Gasper, K., & Clore, G. L. (2000). Do you have to pay attention to your feelings to be influenced by them? *Personality and Social Psychology Bulletin, 26,* 698–711.

Gilovich, T., & Medvec, V. H. (1994). The temporal pattern to the experience of regret. *Journal of Personality and Social Psychology, 67*, 357–365.

Gilovich, T., & Medvec, V. H. (1995). The experience of regret: What, when, and why. *Psychological Review, 102*, 379–395.

Gilovich, T., Medvec, V. H., & Kahneman, D. (1998). Varieties of regret: A debate and partial resolution. *Psychological Review, 105*, 602–605.

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indices in covariance structure analysis: Conventional versus new alternatives. *Structural Equation Modeling, 6*, 1–55.

Hu, L. T., Bentler, P. M., & Kano, Y. (1992). Can test statistics in covariance structure analysis be trusted?. *Psychological Bulletin, 112*, 351–362.

Kahneman, D., & Miller, D. T. (1986). Norm theory: Comparing reality to its alternatives. *Psychological Review, 93*, 136–153.

Komiya, A., Watabe, M., Miyamoto, Y., & Kusumi, T. (2013). Cultural differences in the action effect. *Social Cognition, 31*, 562–577.

Larrick, R. P., & Boles, T. L. (1995). Avoiding regret in decisions with feedback: A negotiation example. *Organizational Behavior and Human Decision Processes, 63,* 87–97.

Lecci, L., Okun, M. A., & Karoly, P. (1994). Life regrets and current goals as predictors of psychological adjustment. *Journal of Personality and Social Psychology, 66,* 731–741.

Lee, S. H., & Cotte. J. (2009). Post-purchase consumer regret: Conceptualization and development of the PPCR scale. *Advances in Consumer Research, 36,* 456–462.

Marcatto, F., Cosulich, A., & Ferrante, D. (2015). Once bitten, twice shy: Experienced regret and non-adaptive choice switching. *PeerJ,* 3:e1035, https://doi.org/10.7717/peerj.1035.

Marcatto, F., & Ferrante, D. (2008). The regret and disappointment scale: An instrument for assessing regret and disappointment in decision making. *Judgment and Decision Making, 3*, 87–99.

Matsumoto, D., Yoo, S. H., Nakagawa, S., Alexandre, J., Altarriba, J., Anguas-Wong, A. M., & Zengeya, A. (2008). Culture, emotion regulation, and adjustment. *Journal of Personality and Social Psychology, 94*, 925.

McConnell, A. R., Niedermeier, K. E., Leibold, J. M., El-Alayli, A. G., Chin, P. P., & Kuiper, N. M. (2000). What if I find it cheaper someplace else?: Role of prefactual thinking and anticipated regret in consumer behavior. *Psychology and Marketing, 17,* 281–298.

Muthén, L. K., & Muthén, B. O. (2009). Mplus statistical modeling software (Version 5.21). Los Angeles: Muthén and Muthén.

Niedenthal, P. M., Tangney, J. P., & Gavanski, I. (1994). "If only I weren't" versus" If only I hadn't": Distinguishing shame and guilt in conterfactual thinking. *Journal of Personality and Social Psychology, 67,* 585–595.

Nunnally, J. C. (1978) *Psychometric theory.* New York: McGraw-Hill.

Oshagbemi, T. (1999). Overall job satisfaction: How good are single versus multiple-item measures?. *Journal of Managerial Psychology, 14,* 388–403.

Petrocelli, J. V., & Crysel, L. C. (2009). Counterfactual thinking and confidence in blackjack: A test of the counterfactual inflation hypothesis. *Journal of Experimental Social Psychology, 45,* 1312–15.

Petrocelli, J. V., & Harris, A. K. (2011). Learning inhibition in the Monty Hall Problem: The role of dysfunctional counterfactual prescriptions, *Personality and Social Psychology Bulletin, 37,* 1297–1311.

Ratner, R. K., & Herbst, K. C. (2005). When good decisions have bad outcomes: The impact of affect on switching behavior. *Organizational Behavior and Human Decision Processes, 96,* 23–37.

Reb, J. (2008). Regret aversion and decision process quality: Effects of regret salience on decision process carefulness. *Organizational Behavior and Human Decision Processes, 105*, 169–182.

Reb, J., & Connolly, T. (2009). Myopic regret avoidance: Feedback avoidance and learning in repeated decision making. *Organizational Behavior and Human Decision Processes, 109*, 182–189.

Roese, N. J. (1997). Counterfactual thinking. *Psychological Bulletin, 121,* 133–148.

Roese, N. J., Epstude, K., Fessel, F., Morrison, M., Smallman, R., Summerville, A. Galinsky, A. D., Segerstrom, S. (2009). Repetitive regret, depression, and anxiety: Findings from a nationally representative survey. *Journal of Social and Clinical Psychology, 28*, 671–688.

Roese, N. J., & Summerville, A. (2005). What we regret most . . . and why. *Personality and Social Psychology Bulletin, 31*, 1273–1285.

Russell, J. A. (2003). Core affect and the psychological construction of emotion. *Psychological Review, 110,* 145–172.

Russell, J. A., & Barrett, L. F. (1999). Core affect, prototypical emotional episodes, and other things called emotion: Dissecting the elephant. *Journal of Personality and Social Psychology, 76*, 805–819.

Schermelleh-Engel, K., Moosbrugger, H., & Müller, H. (2003). Evaluating the fit of structural equation models: Tests of significance and descriptive goodness-of-fit measures. *Methods of Psychological Research Online, 8*, 23–74.

Schwartz, B., Ward, A., Monterosso, J., Lyubomirsky, S., White, K., & Lehman, D. R. (2002). Maximizing versus satisficing: Happiness is a matter of choice. *Journal of Personality and Social Psychology, 83*, 1178 –1197.

Shani, Y., & Zeelenberg, M. (2007). When and why do we want to know? How experienced regret promotes post-decision information search. *Journal of Behavioral Decision Making, 20,* 207–222.

Shimanoff, S. B. (1984). Commonly named emotions in everyday conversations. *Perceptual and Motor Skills, 58*, 514.

Smallman, R., & Roese, N. J. (2009). Counterfactual thinking facilitates behavioral intentions. *Journal of Experimental Social Psychology, 45*, 845–852.

Smith, C. A., & Ellsworth, P. C. (1985). Patterns of cognitive appraisal in emotion. *Journal of Personality and Social Psychology, 48*, 813–838.

Summerville, A. (2011a). The rush of regret: A longitudinal analysis of naturalistic regrets. *Social Psychological and Personality Science. 2*, 627–634.

Summerville, A. (2011b). Counterfactual-seeking: The scenic overlook of the road not taken. *Personality and Social Psychology Bulletin, 37*, 1522–1533.

Taylor, S. E. (1991). Asymmetrical effects of positive and negative events: The mobilization minimization hypothesis. *Psychological Bulletin, 110*, 67–85.

Torges, C. M., Stewart, A. J., & Nolen-Hoeksema, S. (2008). Regret resolution, aging, and adapting to loss. *Psychology and Aging, 23*, 169–180.

Tong, E. (2010). Personality influences in appraisal emotion relationships: The role of neuroticism. *Journal of Personality, 78*, 393–417.

Tsiros, M., & Mittal, V. (2000). Regret: A model of its antecedents and consequences in consumer decision making. *Journal of Consumer Research, 26*, 401–417.

van Dijk, W. W., & Zeelenberg, M. (2002). Investigating the appraisal patterns of regret and disappointment. *Motivation and Emotion, 26*, 321–331.

Watson, D., & Clark, L. A. (1991). The Mood and Anxiety Symptom Questionnaire. Unpublished manuscript, University of Iowa, Department of Psychology, Iowa City.

Wrosch, C., Bauer, I., & Scheier, M. F. (2005). Regret and quality of life across the adult life span: The influence of disengagement and available future goals. *Psychology and Aging, 20*, 657–670.

Zeelenberg, M. (1999). Anticipated regret, expected feedback and behavioral decision making. *Journal of Behavioral Decision Making, 12*, 93–106.

Zeelenberg, M., Inman, J.J., & Pieters, R.G.M. (2001). What we do when decisions go awry: Behavioral consequences of experienced regret. In E. Weber, J. Baron, & G. Loomes (Eds.), *Conflict and decision making*, pp. 136–155. Cambridge, MA: Cambridge University Press.

Zeelenberg, M., & Pieters, R. (1999). Comparing service delivery to what might have been: Behavioral responses to regret and disappointment. *Journal of Service Research, 2*, 86–97.

Zeelenberg, M., & Pieters, R. (2007). A theory of regret regulation 1.0. *Journal of Consumer Psychology, 17*, 3–18.

Zeelenberg, M., van Dijk, W. W., van der Pligt, J., Manstead, A. S., Van Empelen, P., & Reinderman, D. (1998). Emotional reactions to the outcomes of decisions: The role of counterfactual thought in the experience of regret and disappointment. *Organizational Behavior and Human Decision Processes, 75*, 117–141.

Appendix

Regret elicitation instructions: "We would like you to think of a past situation or event where you felt regret. Think about a time when you felt your situation would have been better, if only you had behaved differently. Think about a time when a decision you made negatively affected an outcome, and you wished the decision and/or outcome was different.

Picture this situation in your mind. Try and remember as vividly as you can what this past situation was like. Think of what happened to make you feel regret, and what regret felt like in this particular situation. When you have this memory clearly in mind, answer the following questions:

1. Tell us in detail what happened to cause you to feel this emotion.

2. Tell us in as much detail as you can what you were feeling and thinking.

3. Tell us about what you did and what you said.

As much as possible, write your description so that someone reading it would feel the regret you felt from reading your description."

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