
Sex Differences in Regret: All For Love or Some For Lust?

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Few sex differences in regret or counterfactual thinking are evident in past research. The authors discovered a sex difference in regret that is both domain-specific (i.e., unique to romantic relationships) and interpretable within a convergence of theories of evolution and regulatory focus. Three studies showed that within romantic relationships, men emphasize regrets of inaction over action (which correspond to promotion vs. prevention goals, respectively), whereas women report regrets of inaction and action with equivalent frequency. Sex differences were not evident in other interpersonal regrets (friendship, parental, sibling interactions) and were not moderated by relationship status. Although the sex difference was evident in regrets centering on both sexual and nonsexual relationship aspects, it was substantially larger for sexual regrets. These findings underscore the utility of applying an evolutionary perspective to better understand goal-regulating, cognitive processes.

Keywords: *regret; counterfactual; sex differences; regulatory focus; evolution; parental investment; sexual strategies; goals; motivation; affect*

What might your life be like if you had made key choices differently? What if you had attended a different college, chosen a different career, married someone else? Most people ponder such possibilities at least once in a

while; sometimes they are haunted by the apparent failings such musings reveal. These sorts of thoughts are termed counterfactual, defined as representations of alternatives to past factual events. Many counterfactuals are framed as conditionals, containing an if and a then component, with the if referencing a personal action and the then outlining a personal goal, as in, "If only I had asked her out, we might now be happily married." Regret

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is usually defined as the negative emotion that springs from counterfactual musings, particularly those counterfactuals that are upward (i.e., focusing on how things could have been better) and centered on personal action (Connolly & Zeelenberg, 2002). Regret and counterfactual thinking are widely studied because of their impact on emotional well-being, decision making, behavior regulation, and mental health (Mandel, Hilton, & Catellani, 2005; Roese, 1997, 2005; Zeelenberg, 1999).

Sprawling as this literature has become, it contains barely a hint of replicable sex differences. This absence may be a reflection of the social domains in which past research has been situated. The present research tests whether sex differences in regret might be evident within some, but not other, domains of social life. A tantalizing hint as to this possibility appeared in Landman and Manis's (1992) investigation of which aspects of life people regret most (cf. Roese & Summerville, 2005). Although overall they found "no age or sex differences . . . in frequency of counterfactual thought" (p. 474), they also noted that within the domain of romantic relationships, a sample of young adults "was almost equally divided among those imagining having had more relationships and those who imagined having had fewer, with males predominating in the first group and females in the second" (p. 476). To our knowledge, this intriguing observation has never been further pursued.

Indeed, past research on regret and counterfactual thinking has focused mainly on achievement domains, such as those involving educational (Nasco & Marsh, 1999), athletic (Grieve, Houston, Dupuis, & Eddy, 1999), gambling (Markman, Gavanski, Sherman, & McMullen, 1993), or work-related goals (Morris, Moore, & Sim, 1999), with relatively little examination of the romantic domain. To close this gap in the literature, the present research examined regrets centering on close romantic relationships and compared them to regrets in other domains, both interpersonal (e.g., friend and parental relationships) and achievement related. Within the domain of romantic relationships, there are compelling theoretical reasons to expect that sex differences will emerge in the form of variation between subtypes of regrets.

One reason why sex differences in regret might be especially pronounced in romantic as opposed to other close relationships derives from an evolutionary perspective on mating strategies (e.g., Buss & Schmitt, 1993; Kenrick, Groth, Trost, & Sadalla, 1993; Li, Bailey, Kenrick, & Linsenmeier, 2002; Li & Kenrick, in press). According to this perspective, basic differences in the reproductive biology of women and men account for divergences in mating preferences and behavior. Whereas the minimum required parental investment for men can be as little as a few minutes and a few gametes, it is much larger for women, who incur the costs of pregnancy, lactation, and

child care (Trivers, 1972). In addition, men who take on multiple sexual partners in a given time period can potentially sire offspring with each partner, whereas women with multiple sex partners are limited to having one child per year. Thus, casual sex tends to confer more fitness benefits and fewer fitness costs to men than to women (Symons, 1979). Indeed, past research has confirmed men's relative willingness and women's relative caution toward casual sex (e.g., Buss & Schmitt, 1993; R. D. Clark & Hatfield, 1989; Kenrick, Sadalla, Groth, & Trost, 1990). In a study of new relationship initiation (C. L. Clark, Shaver, & Abrahams, 1999), men recalled using more direct and active strategies than did women. These considerations suggest that, on average, women will be more cautious than men when it comes to initiating romantic encounters in general. As such, men more than women may regret neglecting to pursue romantic opportunities.

In romantic relationships, women typically take on the tasks of monitoring emotional needs, maintaining harmony, defusing conflict, and regulating negative emotions (Cross & Madson, 1997; Duncome & Marsden, 1995; Strazdins & Broom, 2004). Women more than men focus on keeping matters of romance from deteriorating. Because women's reproductive value drops off more sharply with age than men's, it follows that when a relationship fails, the lost time may pose a larger reproductive cost to women than to men. Thus, women more than men may have long-term romantic regrets centering on prevention failures and having made the wrong choices. Taking into consideration both the differential time decay of reproductive value as well as the differential costs and benefits of sexual encounters, we may expect these sex differences to be especially apparent when individuals focus on regrettable sexual as opposed to nonsexual actions.

The present research frames sex differences in terms of prior investigations regarding the structure of regret: inaction versus action. Regrets of inaction center on what should have been done, whereas regrets of action center on what should *not* have been done (Gilovich & Medvec, 1995; Roese & Olson, 1993; Zeelenberg, van den Bos, van Dijk, & Pieters, 2002), and these distinctions have been shown to map onto regulatory goals centering on promotion and prevention, respectively (e.g., Higgins, 1997; see also Elliot & Thrash, 2002). Following a failure to obtain a valued outcome (e.g., failure to achieve a passing grade, i.e., promotion failure), individuals focus on actions they should have taken to have achieved that outcome (i.e., an additive counterfactual, akin to a regret of inaction, as in "I should have studied"). By contrast, following a failure to prevent an undesirable outcome (e.g., failure to avoid a car accident, i.e., prevention failure), individuals focus on actions they should have foregone so as to have preserved the status quo (i.e., a subtractive counterfactual,

akin to a regret of action, as in “I shouldn’t have been speeding”; see Pennington & Roese, 2003; Roese, Hur, & Pennington, 1999). Thus, regrets may be understood partly in terms of their relation to individuals’ ongoing goals, meaning that there is a close correspondence between desires toward which individuals acted or did not act and regrets regarding actions or inactions that might have resulted in different outcomes.

Overview of Research

We tested whether sex differences in regret, absent in other domains, might emerge exclusively within the domain of romantic relationships. Study 1 was the first test of domain-specificity, examining retrospective reports of actual regrets of inaction (i.e., promotion focus) versus action (i.e., prevention focus) as a function of participant sex and social domain (romantic relationships vs. parental interactions vs. academic achievement). Study 2 tested retrospective reports of actual regrets within the domains of friendship versus romance. Study 3 presented participants with a set of regrets that were rated in terms of self-perceived frequency and intensity and tested whether regret content centering on sexual versus nonsexual aspects of romantic relationships moderated the sex difference in regret.

Because these studies focused on long-term regrets, we expected to replicate the commonly reported finding that regrets of inaction outnumber regrets of action for temporally distant but not recent events (Gilovich & Medvec, 1995; Zeelenberg, van der Pligt, & Manstead, 1998). For this reason, we anticipated that sex differences would be superimposed over this main effect: The tendency for regrets of inaction to outnumber regrets of action should be substantially weaker among women than men, but only within the domain of romantic relationships.

STUDY 1: DOMAIN SPECIFICITY OF SEX DIFFERENCES

This study assessed sex differences in recollections of regrets derived from actual interpersonal experiences. Women and men completed questionnaires containing a request to record three salient regrets. On a between-subject basis, these regrets were requested to fall within romantic relationships, nonromantic relationships (interactions with parents), or academic achievement. We hypothesized a sex difference within the romantic domain only, such that men more than women would emphasize regrets of inaction (promotion) over action (prevention). The nonromantic relationship condition permitted a test of the degree of domain specificity of sex differences in romantic relationships. In other words, might sex differences be common to regrets centering on any

close interpersonal relationship, or might they be specific to romance per se?

Participants and Procedure

This study comprised three samples assessed at different points in time. Each sample was asked to focus on a different domain (romantic relationships, parental relationships, or academic achievement). In total, the samples included 62 women and 61 men attending the University of Illinois who participated in exchange for course credit. The mean age of participants was 20.1 years ($SD = 1.59$).

Each participant completed a one-page questionnaire containing spaces for three regrets that focused on one of the three life domains. This questionnaire was bundled along with a variety of other, unrelated questionnaires. Regrets were assessed using the following instructions:

As you look back across all the things that have happened to you . . . , is there anything in particular that stands out as a regret? In other words, is there something that you wish you had done differently, or some actions you wish you had or had not taken? In the space below, please record a few details about three different regrets. The spaces below are set up using an “if-then” format.

Participants recorded regrets using three numbered, underlined spaces that included stems for both the counterfactual antecedent (“IF ____”) and the consequent (“THEN ____”).

Results and Discussion

The coding of regrets into inaction versus action was completed by two raters blind to the research hypotheses (mean Cohen’s $\kappa = .83$). Disagreements were resolved by discussion with the first author. Because not all participants recorded three unique responses in the spaces provided, and because not all such responses could be coded as regrets, we used the proportion of all thoughts recorded for each regret subtype (inaction vs. action) as the dependent measure. Thus, a participant who recorded only one inaction regret in total and another who recorded three inaction regrets of inaction in total would both have scores of 1.0 for the variable of inaction regret. This measurement strategy is more appropriate than raw frequencies because our conceptual interest centered on the relative salience as opposed to overall volume of regrets of inaction versus action. Also, proportions were arc sin transformed to achieve a more normal distribution (Smith, 1976) prior to assessment via analysis of variance; means presented in the text, tables, and figures are the untransformed proportions. Because the three samples were assessed at different points in time, random assignment to domain condition was obviously not achieved.

Each sample was assessed using a 2 (sex) × 2 (regret: action vs. inaction) ANOVA. No sex differences were evident in the regrets centering on parental relationships (interaction $F = .05, p = .82$) or on those centering on academic achievement ($F = .26, p = .61$). In both of these domains, a main effect of regret subtype was significant, such that inaction regrets outnumbered action regrets; parental relationships: $F(1, 38) = 14.8, p < .001, d = 1.22$; academic relationships, $F(1, 39) = 14.9, p < .001, d = 1.21$ (see Table 1 and Figure 2).

Within the domain of romantic relationships, the 2 × 2 interaction was significant, $F(1, 40) = 7.29, p = .01, d = .83$. Men reported more inaction than action regrets ($M_s = .71$ vs. $.29, SD_s = .34, .34$), $t(20) = 3.05, p = .006, d = 1.33$, whereas women reported equivalent numbers of inaction and action regrets ($M_s = .47$ vs. $.53, SD_s = .27, .27$), $t(20) = .39, p = .70, d = .17$.

This study thus revealed a sex difference in regrets that was domain specific. Men focused more on regrets of inaction than action, whereas women reported an even mix of these two regret types. As in previous research, women and men were very similar in their achievement-oriented regrets, which focused mainly on inaction (what past actions should have been done to have achieved success). Moreover, the sex difference is apparently unique to romantic as opposed to nonromantic relationships, in that no sex difference was evident in regrets centering on interactions with parents.

STUDY 2: REGRETS IN ROMANCE VERSUS FRIENDSHIP

Study 2 was designed to replicate the finding of a sex difference within the romantic domain and to probe further the degree of domain specificity by assessing regrets for relationships with friends. Although parents (examined in Study 1) tend to be emotionally close, they differ from romantic partners in a number of ways, including relative age and hierarchical power. Relationships with friends may be as emotionally close as those with parents; they not to differ so much in terms of age and power. If sex differences are absent from friendship regrets as well as parent regrets, we may rule out simpler explanations centering on age and power and focus instead on theoretical aspects intrinsic to romantic relationships. A second goal was to conduct content analyses to test more directly whether regulatory focus (i.e., promotion vs. prevention) maps onto the structural distinction between regrets of inaction and action.

An important concern for such a content analysis is whether the regrets provided by participants are comparable in terms of their focus. In Study 1, participants reported regrets from a potentially wide assortment of past romantic relationships. That is, the instructions

TABLE 1: Regrets of Inaction Versus Action Expressed by Women and Men

Domain		Inaction Regret	Action Regret	Difference
Romance (Study 1)				
Women	21	.47 _a (.27)	.53 _a (.27)	-.06
Men	21	.71 _a (.34)	.29 _b (.34)	.43
Parents (Study 1)				
Women	21	.69 _a (.30)	.31 _b (.30)	.38
Men	19	.65 _a (.30)	.35 _b (.30)	.30
Achievement (Study 1)				
Women	20	.65 _a (.30)	.35 _b (.30)	.30
Men	21	.69 _a (.35)	.31 _b (.35)	.38
Romance (Study 2)				
Women	40	.60 _a (.35)	.40 _a (.35)	.20
Men	29	.80 _a (.31)	.20 _b (.31)	.60
Friendship (Study 2)				
Women	40	.67 _a (.31)	.33 _b (.31)	.34
Men	29	.64 _a (.27)	.36 _b (.27)	.28

NOTE: Values represent proportion of each regret type of the total number of thoughts recorded, with standard deviations in parentheses. Means within rows not sharing a common subscript differ at $p < .05$.

did not specifically request participants to focus on one particular romantic partner but instead allowed participants to report regrets centering on perhaps just one, or maybe a few, or even many prior romantic relationships, with the determination of this left to participants' own discretion. Although this procedural aspect might simply incur random error, we cannot rule out the possibility that women and men systematically differed in how they interpreted the vagueness of this instruction. Therefore, in Study 2, participants were asked first to focus on a single individual (and to record that individual's initials so as to keep that individual firmly in mind). Participants then reported regrets derived from experiences with that individual only. Any sex differences observed using this technique could not so easily be attributed to sex-specific preferences for discussing many versus few past relationship partners. This procedural revision also benefits the test of the correspondence between regulatory and regret subtype. For each regret, a subjective coding of promotion versus prevention focus by an independent rater could be compared to the coding of regret subtype (inaction vs. action) within a particular relationship.

With the results of Study 1 in hand, we expected that for romantic relationships, men would report regrets more often emphasizing promotion over prevention, whereas women would report regrets emphasizing promotion and prevention in more equivalent numbers. But would this same sex difference appear in regrets focusing on friendships?

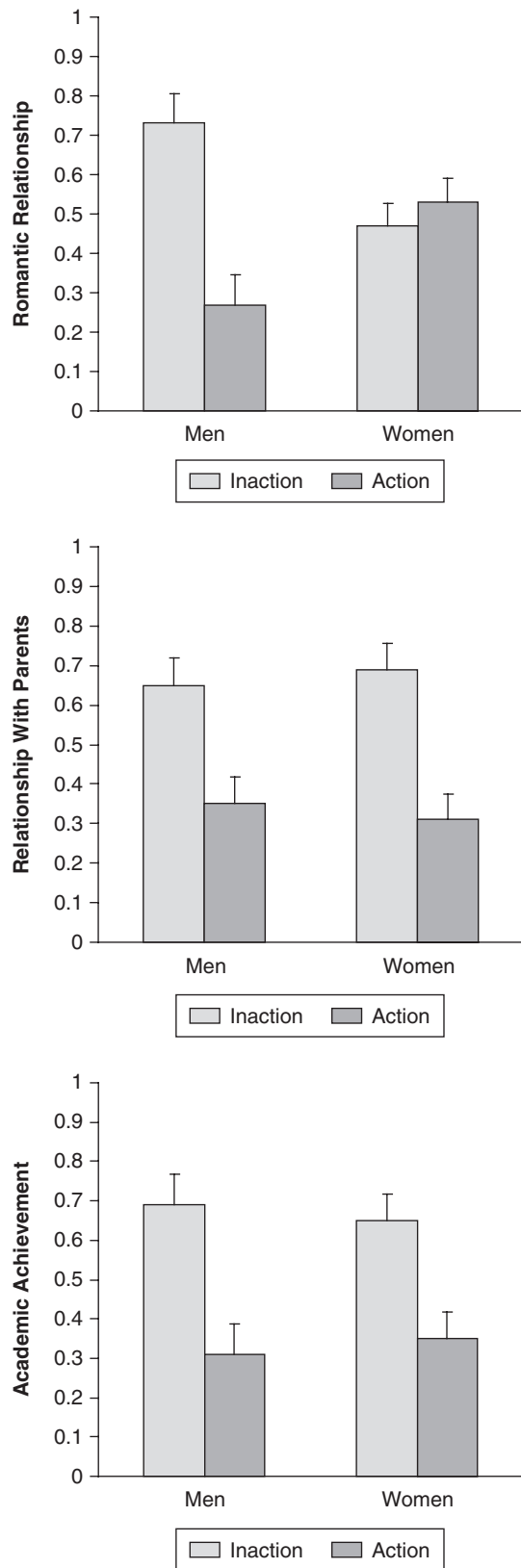


Figure 1 Domain specificity of regret sex differences (Study 1).

Participants and Procedure

Sixty-nine participants (40 women, 29 men) attending the University of Illinois participated for course credit. The mean age of participants was 19.0 years ($SD = 1.18$).

In counterbalanced order, participants recorded regrets regarding interactions with a friend and romantic partner. Care was taken to ensure that participants focused on a particular individual for both relationship types (as opposed to summarizing regrets across multiple relationships). This was done by having participants record the initials of the individual whom they had in mind. The instructions were as follows:

Think for a moment about the interactions with a very close friend [person that you have dated or been romantically attached to]. Try to pick one particular person that you have known for a long time and been very close to [you have dated recently].

Write the initials of this close friend [romantic partner] here: _____.

As you look back across your experiences with this close friend [romantic partner], is there anything in particular that stands out as a regret? In other words, is there something that you wish you had done differently, or some actions you wish you had taken or not taken? In the space below, please record a few details about three different regrets. The spaces below are set up using an "if-then" format.

Be sure to focus only on regrets involving your interactions with your close friend. [Be sure to focus only on regrets involving your interactions with your romantic partner.] (Italics in original)

Participants had space to record three regrets; each space included stems labeled "if only" and "then."

Results and Discussion

Regret codings. The codings of regrets into regrets of inaction versus action were completed by two people blind to the research hypotheses (Cohen's $\kappa = .91$). Disagreements were resolved by discussion with the first author.

The main dependent measure was again the proportion of regrets corresponding to action or inaction out of the total number of regrets recorded (arc sin transformed for ANOVA). Taking these proportions as the dependent variable, a 2 (sex) \times 2 (relationship type: romance vs. friendship) \times 2 (regret: action vs. inaction) ANOVA (the latter two factors were within-subject variables) revealed a significant three-way interaction, $F(1, 60) = 5.53$, $p = .02$, $d = .60$. Again, regrets of inaction were more numerous than regrets of action ($M_s = .67$ vs. $.33$, $SD_s = .32$, $.32$), $F(1, 60) = 28.4$, $p < .001$, $d = 1.35$. To better understand the three-way interaction, we

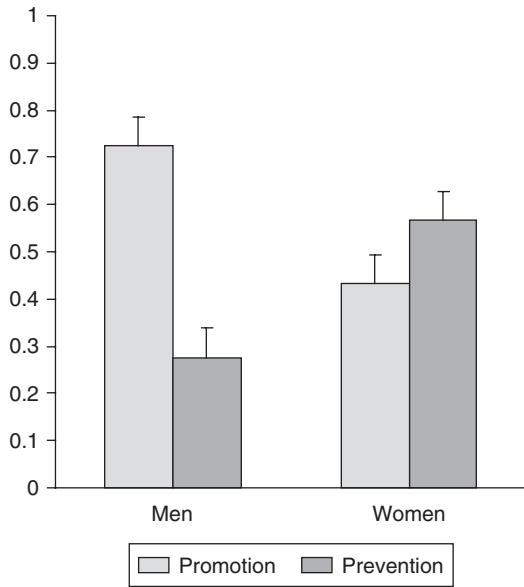


Figure 2 Romantic regrets centering on promotion versus prevention goals (Study 2).

conducted separate two-way ANOVAs within the two types of relationships (means appear in Table 1).

Looking first to friendships, no sex difference was evident. There was a significant main effect of regret subtype, with inaction regrets predominating over action regrets ($M_s = .66$ vs. $.34$, $SD_s = .29$, $.29$), $F(1, 60) = 13.8$, $p < .001$, $d = .94$. But neither the main effect of sex ($F = 0$) nor the interaction between sex and regret subtype was significant ($F = .31$). For friendships, women reported more inaction than action regrets ($M_s = .67$ vs. $.33$, $SD_s = .31$, $.31$), just as did men ($M_s = .64$ vs. $.36$, $SD_s = .27$, $.27$).

Looking next to romantic relationships, however, there was indeed a significant interaction between sex and regret subtype, $F(1, 61) = 5.30$, $p = .02$, $d = .59$. The difference between inaction and action regrets was much bigger for men ($M = .60$) than women ($M = .20$). That is, men generated many more regrets of inaction than action ($M_s = .80$ vs. $.20$, $SD_s = .31$, $.31$), $t(28) = 4.78$, $p < .001$, $d = 1.88$, whereas women generated only slightly more inaction regrets than action regrets ($M_s = .60$ vs. $.40$, $SD_s = .35$, $.35$), $t(61) = 1.75$, $p = .09$, $d = .58$. This pattern replicated that found in Study 1.

Regulatory focus codings. Each regret was coded as to whether it emphasized promotion (e.g., focusing on acquisition, attainment, improvement, etc.) or prevention (e.g., security and caution, bypassing obstacles, protecting a relationship from decline, etc.). Again, two individuals coded the regrets and these achieved satisfactory

interrater agreement (Cohen's $\kappa = .72$). Disagreements were resolved by discussion.

The proportion of regrets that emphasized promotion versus prevention were analyzed with a three-way (Sex \times Relationship Type \times Regulatory Focus) ANOVA. This analysis also revealed a significant three-way interaction, $F(1, 60) = 12.2$, $p = .001$, $d = .89$. To illuminate this interaction, separate two-way ANOVAs were conducted.

Looking first to friendships, no sex difference was evident. Indeed, no effects reached statistical significance (interaction $F = .42$). Looking next to romantic relationships, the Sex \times Regulatory Focus interaction was significant, $F(1, 61) = 11.4$, $p = .001$, $d = .86$. For women, the proportions of regrets emphasizing promotion and prevention were similar ($M_s = .43$ vs. $.57$, $SD_s = .37$, $.37$), $t(39) = 1.07$, $p = .29$, $d = .36$. For men, however, regrets were more likely to emphasize promotion than prevention ($M_s = .72$ vs. $.28$, $SD_s = .32$, $.32$), $t(28) = 3.82$, $p = .001$, $d = 1.50$ (see Figure 1). Thus, when regulatory focus is coded directly, the observation of sex differences in regrets of romance but not friendships holds.

Relation between regret structure and regulatory focus content.

The above findings reveal a parallel between regret structure and content, such that regrets of inaction correspond to promotion failure and regrets of action correspond to prevention failure. This was the same relation observed using a variety of methods in previous research on counterfactual thinking (Pennington & Roese, 2003; Roese et al., 1999). With each participant in the present research recording as many as six regrets, and with structure and content codings available for each regret, it was thus possible to measure the degree of association between structure and content in a novel way. Of all regrets recorded, 83.9% represented matches between both inaction and promotion and between action and prevention, $\chi^2(1) = 451$, $p < .001$, $\phi = .64$. This pattern adds confidence to the use of regret structure as a marker for regulatory focus.

Relationship status does not qualify the sex difference. One intriguing hypothesis is that a relatively stronger emphasis on promotion goals might be associated not with biological sex per se but with the stage or status of a romantic relationship. That is, the status of being single and looking for new relationships might be a situation that evokes relatively greater promotion focus for women and men equivalently, whereas the status of being in a more stable, ongoing relationship might evoke more of a prevention focus in both women and men. Indeed, previous research has shown that different life circumstances, such as becoming a new parent, influence ongoing regulatory goals (e.g., Alexander & Higgins, 1993). If college-age women more than men tended to be involved in steady relationships, this sampling confound might account for the sex

difference we have observed. Our procedure permitted us to test this possibility directly, in that participants noted whether the romantic relationship for which they recalled regrets was a current or past relationship. Of the women, 19 of 28 (68%) were currently in a relationship; of the men, 17 of 33 (52%) were in a relationship. These two proportions did not differ significantly, $\chi^2(1) = 1.67, p = .20$. More important, when relationship status was entered as a between-participant factor along with sex in an ANOVA testing the proportions of regrets centering on inaction versus inaction, it did not qualify the sex difference, $F(1, 57) = .78, p = .39, d = .23$. This analysis rules out the explanation that relationship status underlies the sex difference. Rather, there seems to be something intriguingly different about the way in which women and men formulate the regrets centering on their romances but not their friendships.

STUDY 3: SEXUAL VERSUS NONSEXUAL REGRET

Study 3 assessed more specific content differences that underlie the sex difference in regrets of romance. Thus far, we have shown that sex differences are specific to romantic domains and that such differences map onto the distinction between promotion and prevention focus. Yet, within the domain of romance, an essential distinction can be made between regrets focusing on sexual versus nonsexual aspects of the relationship. From an evolutionary perspective in particular, it might be argued that men are more likely to regret missed sexual opportunities because they, more than women, can maximize reproductive outcomes via additional mating partners (e.g., Buss & Schmitt, 1993; Kenrick et al., 1993; Trivers, 1972). According to this view, women might be more likely to regret errors in sexual activity because of the greater costs of reproduction associated with motherhood (e.g., pregnancy, lactation, child care). This theoretical viewpoint suggests that the biggest sex differences in regret will be those focusing on sexual as opposed to nonsexual activity.

To test this hypothesis, we employed a method different from the first two studies. Rather than having participants report their own real regrets, participants instead rated regrets presented to them in terms of how often and how intensely they experienced each one. The regrets themselves corresponded to a 2 (regulatory focus: promotion vs. prevention) \times 3 (domain: sexual-romantic, nonsexual romantic, and friend/family) design. We expected to replicate our previous findings with this new method in that men more than women would give greater frequency/intensity ratings to the items corresponding to promotion as opposed to prevention, but only within the romantic domains. But would the sex difference vary as a function of whether the romantic regrets focused on sexual versus nonsexual content?

Participants and Procedure

Four hundred and eighty-six students (317 women, 169 men) attending the University of Illinois participated for course credit. The mean age was 20.1 years ($SD = 1.62$). Participants were presented with 18 written regrets purportedly transcribed from previous research. These regrets corresponded to the 2 (promotion vs. prevention) \times target (sexuality, romance, friend/family) factorial structure, with three items for each of the six subscales derived from the 2 \times 3 design (items appear in Table 2). For each one, participants first decided whether the regret was applicable or not applicable, as per the following instruction, "If the regret is not applicable to your life (e.g., the regret is about missing band practice and you don't play in a band), then check 'not applicable' and move directly to the next question." A rating of regret frequency and intensity was made for each item (using 7-point scales) only if participants found the regret to be applicable. This procedure allowed us to test more precisely the patterns among those who have actually had opportunities to feel the specific regret in question.

Results and Discussion

The regret frequency and intensity ratings were highly correlated (mean within-participant $r = .67$) and thus were averaged. The summary regret scores thus created were then combined into six subscales corresponding to the 2 (promotion vs. prevention) \times target (romance-sexual, romance-nonsexual, friend/family) factorial structure. Because ratings were completed only for items that participants themselves deemed applicable, sample size varied from item to item. With these two within-subject factors combined with the between-subject factor of sex of participant, the resulting ANOVA revealed a significant three-way interaction, $F(2, 146) = 25.1, p < .001, d = .82$. Overall, regret ratings were higher for promotion than prevention ($M = 3.40$ vs. 3.08), $F(1, 146) = 8.96, p = .02, d = .49$, but the main effect of participant sex was not significant, $F(1, 146) = 1.95, p = .17, d = .23$. As in our previous studies, a sex difference became apparent only in the form of interactions involving regulatory focus.

The interaction pattern replicates the finding in Study 2 in that the tendency for men but not women to emphasize promotion over prevention is evident in the sexuality (first four bars in Figure 3, two-way interaction, $F[1, 178] = 19.4, p < .001, d = .66$) and romance (second four bars in Figure 3, $F[1, 376] = 12.7, p < .01, d = .37$) domains but not in the friends/family domain (last four bars in Figure 3). In the latter case, the interaction is the reverse of the sexuality and romance domains, $F(1, 178) = 3.66, p = .06, d = .29$.

Another way to describe the three-way interaction is in terms of pairwise contrasts between women and men

TABLE 2: Regret Content Ratings (Study 3)

	Women			Men			Effect Size	
	M	SD	n	M	SD	n	d	p
Promotion-sexual								
“Should have tried harder to sleep with ____.”	2.13	1.64	90	3.80	2.17	88	.44	<.001*
“Kicked myself for missing out on a chance to have sex with ____.”	2.07	1.57	81	3.47	1.96	78	.40	<.001*
“Wished I could have more sex with different people.”	1.99	1.38	102	3.52	1.99	102	.45	<.001*
Prevention-sexual								
“Wished I hadn’t slept with ____.”	3.68	1.95	149	3.45	1.68	89	.06	<i>ns</i>
“Regretted having sex with ____.”	3.77	1.97	143	3.54	1.77	81	.06	<i>ns</i>
“Shouldn’t have had sex with ____.”	3.82	2.01	141	3.50	1.87	73	.08	<i>ns</i>
Promotion-romance								
“Wished I could date more people.”	3.62	1.75	266	4.35	1.78	140	.20	<.001*
“Did a better job of making romantic relationship develop.”	3.70	1.90	220	4.18	1.82	119	.12	.03*
“Tried harder to meet new people that I could go out with.”	3.98	1.71	264	3.99	1.76	145	.002	<i>ns</i>
Prevention-romance								
“Avoid going out with people I know I won’t like.”	2.84	1.49	217	2.73	1.58	121	.03	<i>ns</i>
“Should have broken up with ____ sooner because s/he wasn’t the right person for me.”	3.91	1.96	193	3.80	1.97	93	.03	<i>ns</i>
“Do a better job of not going out with losers.”	2.74	1.89	139	2.01	1.57	50	.18	.02*
Promotion-friends/family								
“Wished I had tried harder to make friends.”	3.61	1.75	285	3.34	1.65	146	.07	.13
“Wished I had tried harder to keep up contacts with a friend.”	4.76	1.43	305	4.46	1.47	159	.10	.03*
“Been nicer to my brother/sister.”	3.63	1.69	234	3.63	1.64	131	.0001	<i>ns</i>
Prevention-friends/family								
“Not lost touch with my brother/sister.”	3.18	1.89	124	3.49	1.96	82	.08	<i>ns</i>
“Wished I hadn’t been such a hot-head.”	2.91	1.74	183	3.08	1.70	102	.05	<i>ns</i>
“Not allowed my family to grow so distant.”	2.79	1.82	156	3.02	1.61	84	.06	<i>ns</i>

NOTE: Mean values are average of regret frequency and intensity ratings.
 * $p < .05$.

within each of the six subscales. By far the largest such contrast centered on promotion-oriented sexuality: Men more than women regretted not having pursued sexual relations ($M_s = 3.51$ vs. 2.07), $t(241) = 7.28$, $p < .001$, $d = .94$. The flip side of this effect was weaker in that women were slightly more likely than men to regret failures to prevent imprudent sexual activity ($M_s = 3.71$ vs. 3.32), $t(252) = 1.64$, $p = .10$, $d = .21$. Turning next to the non-sexual side of romantic relationships, men gave higher ratings than women to the promotion-oriented regrets ($M_s = 4.10$ vs. 3.74), $t(455) = 2.37$, $p = .02$, $d = .22$, but the tendency for women to give higher ratings for regrets of prevention was much weaker ($M_s = 3.23$ vs. 3.00), $t(395) = 1.56$, $p = .12$, $d = .16$. Turning finally to those relationships involving friends and family, women were not much different from men in their promotion-oriented regrets ($M_s = 4.07$ vs. 3.86), $t(478) = 1.82$, $p = .07$, $d = .17$, or in their prevention-oriented regrets ($M_s = 3.15$ vs. 3.28), $t(439) = .77$, $p = .44$, $d = .07$.

The focal question of Study 3 was whether sexually oriented regrets were more sharply sex differentiated than nonsexual regrets. They were. One indication was the significant three-way interaction comparing the two-way sex-difference interactions within the sexual versus nonsexual sides of romance, that is, the 2 (sex of participant) \times 2 (promotion vs. prevention) \times 2 (sexual

vs. nonsexual) interaction, $F(1, 169) = 10.1$, $p = .002$, $d = .49$. Another indication was the contrast between the two largest pairwise sex differences described above: those within promotion-sexual ($d = .94$) and promotion-nonsexual ($d = .22$). This two-way interaction also was significant, $F(1, 236) = 16.4$, $p < .001$, $d = .53$. Thus, although there was a significant sex difference in romantic regrets of both a sexual as well as nonsexual nature, the sex difference was larger when regrets focused on sexual behavior.

Recall that prefacing each regret item was the dichotomous judgment of whether the regret was applicable to one’s life and if participants checked “not applicable” they did not perform the frequency and intensity ratings. This strategy ensured that the above effects are relatively pure in the sense of not being clouded by those participants who lack the relevant experiences to make an informed retrospective judgment. However, this dichotomous applicability judgment is in itself an additional (albeit less sensitive) indicator of sex differences in regret. Participants could deem a regret inapplicable for at least two reasons: (a) they have no relevant experiences (e.g., the regret focuses on siblings but the participant is an only child) or (b) they have had relevant experiences but the regret suggests attitudes deeply discrepant from their own. In this latter case, the nonapplicable judgment

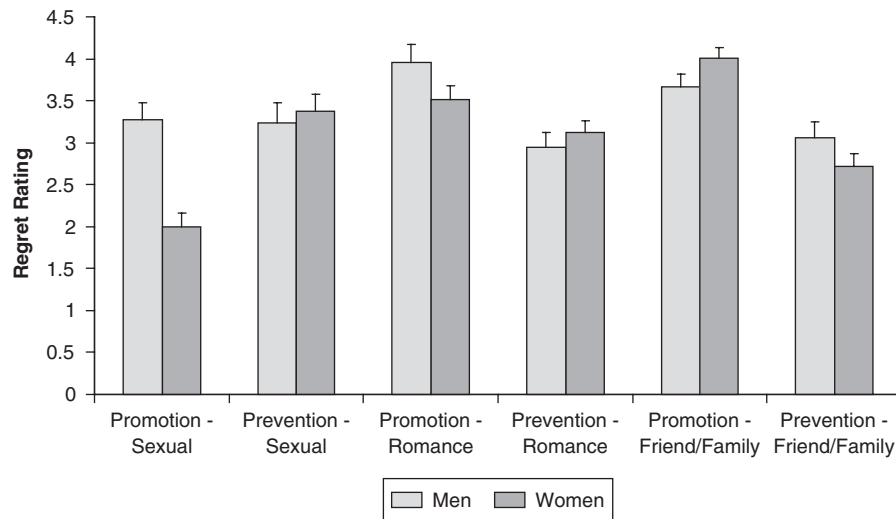


Figure 3 Regret content ratings (Study 3).

might correspond to the lowest end of the frequency or intensity rating scales, hence, we might expect applicability rates to mirror the parametric effects described above. This was indeed the case. Pooling proportions across items, men more than women found sexual-promotion regrets to be applicable (49.7% vs. 24.4%), binomial $Z = 2.37$, $p = .009$. No such sex differences were found within the other five cells (p range = .30 to .49). The dichotomous applicability judgment, less sensitive though it may be compared to parametric measures, was nevertheless sufficiently sensitive to detect the largest of the sex differences noted above, that involving sexual-promotion regrets.

Study 3 therefore pinpointed the content basis of the sex difference in regrets observed in the previous studies: Promotion versus prevention differences were stronger in the sexual than nonsexual sphere. Put simply, men more than women regret not having pursued sexual activity.

GENERAL DISCUSSION

Although the bulk of previous research on counterfactual thinking and regret contains little evidence for sex differences, findings reported by Landman and Manis (1992) hinted that sex differences might be found specifically in the romantic domain. Furthermore, the convergence of theories of parental investment and regulatory focus suggested a more formal basis for predicting domain-specific sex differences in regret. In the present research, we found that sex differences were evident only in regrets focusing on romantic relationships, not when they focused on friendships, parents, or academic achievement.

Past research has shown that when focusing on long periods of time, the biggest regrets center on inaction—on

what the individual might have done (as opposed to *not* done) to have achieved a better outcome (Gilovich & Medvec, 1994, 1995; Roese et al., 1999; Roese & Olson, 1993; Zeelenberg, van Dijk, Manstead, & van der Pligt, 1998). We replicated this finding in all domains tested and our new findings are superimposed over this effect. That is, within the domain of romantic relationships, women were much less likely than men to show this pattern. Instead, their romantic regrets emphasized a balance of inaction and action regrets. The present research constitutes the first clear demonstration of sex differences in regret, but of importance, this sex difference is domain-specific.

To characterize this pattern, we drew on the distinction between promotion and prevention focus as articulated in regulatory focus theory (Higgins, 1997, 1998). Counterfactual conditional thoughts frequently center on goal pursuit in that the if and the then components center on means and ends, respectively (e.g., "If only I had studied, I would have passed the test") (Roese, 1994, 1997). Our earlier research established a link between regulatory focus and counterfactual thinking (Pennington & Roese, 2003; Roese et al., 1999). In Study 2, by coding the contents of participants' regrets in terms of promotion versus prevention focus, we provided further evidence that ties regrets of inaction to promotion focus and regrets of action to prevention focus. This connection permitted us to characterize the sex difference findings in terms of regulatory focus: Women and men tend to be similar in many life domains in terms of a tendency to emphasize regrets centering on promotion rather than prevention failure, but women differ from men in emphasizing regrets involving prevention to a greater extent when it comes to romantic relationships. Extrapolating from other research on regulatory focus,

we might further expect diverging emotional nuance in women's and men's romantic regrets. For example, prevention failure is associated with anxiety-related emotions, whereas promotion failure is associated with dejection-related emotions (e.g., Higgins, Shah, & Friedman, 1997; Roney, Higgins, & Shah, 1995). From this vantage point, future research might reveal that women's romantic regrets have a more anxious and worrisome tone, whereas men's romantic regrets contain more despondence.

The present findings suggest interesting implications for the practical side of relationship maintenance. If women and men differ in the kinds of regrets that haunt them for long periods of time, such regrets may be a source of continuing misunderstanding. Disagreements may arise over how best to manage money, raise children, or maintain a household, but whatever solutions are agreed on, the long-term recollections of these conflicts will in women center to a greater extent on actions that should have been avoided, whereas in men they will reflect actions that should have been taken to produce an improved state of affairs. Recognizing these basic motivational differences might be useful for couples interested in long-term conflict resolution and represents an interesting direction for studies of a therapeutic nature.

Further questions remain for future research. First, we found that whether individuals focused on a current relationship or recalled one from the past did nothing to moderate the sex difference. This finding suggests that there is something intrinsic to biological sex, not to relationship stage, that accounts for the sex difference. However, this conclusion remains tentative pending further investigations across a wider range of relationships stages, durations, and age ranges. Second, we concluded that sex differences in regret are domain-specific, to be found only in regrets centering on romantic relationships. This conclusion was based on the contrast to other close relationships, such as those involving friends (Study 2) and parents (Study 1), as well as to regrets evoked by achievement situations (Study 1), each of which revealed no evidence of a sex difference. The question remains whether the sex difference might appear in still other kinds of relationships, particularly those in which women may be primarily responsible for relationship maintenance and hence prevention focus (e.g., providing care for the young or elderly).

Our findings are consistent with evolutionary theories of mate preference and selection (e.g., Buss & Schmitt, 1993; Kenrick, Trost, & Sundie, 2004; Li et al., 2002). According to this view, reproductive biological differences between women and men account for variation in mate choice. Women tend to be more cautious when pursuing romantic possibilities because with higher costs of producing offspring (e.g., pregnancy, lactation, child care), mistakes in mate selection are costlier for women than men (Trivers, 1972). By contrast,

men face fewer constraints and can increase their chances of producing viable offspring by mating with more partners; hence, regrets regarding not trying hard enough to mate would be predicted to be greater for men than women. Study 3 revealed that the sex difference in regret, although statistically significant for both the sexual as well as nonsexual side of romantic relationships, is nevertheless much stronger for sexual regrets. Of the various ratings of regret intensity and frequency, by far the largest sex difference occurred on the items centering on promotion-focused sexuality. Men are vastly more likely than women to regret not trying harder to have sex or to regret missing an opportunity for sex.

The evolutionary perspective on counterfactual thinking may be further explored in future cross-cultural research. On one hand, it is possible that in cultures where casual sex is rare and men are expected to invest more heavily in their offspring, sex differences in romantic regret may be smaller. On the other hand, regret psychologies may be more strongly linked to the inherent sex differences in fitness costs and benefits, regardless of the actual mating dynamics found in local conditions. Of interest, Gilovich, Wang, Regan, and Nishina (2003) discovered cross-cultural consistency in the base rates of regrets of inaction versus action. However, Chen, Chiu, Roese, Tam, and Ivy (2005), by examining domain specificity in a manner analogous to the present research, found that Chinese respondents were more likely to emphasize action than inaction regrets (i.e., prevention over promotion) than American respondents when focusing on academic achievement and family interactions. More generally, Asian relative to North American respondents tend to emphasize prevention over promotion (Lee, Aaker, & Gardner, 2000), and whether this cultural difference in regulatory focus superimposes over, or interacts with, the sex difference we have uncovered remains for future research to examine (see also Janicki & Krebs, 1998; Kenrick, Ackerman, & Ledlow, 2003).

A final theoretical connection worthy of future exploration is the link between regulatory focus theory and evolutionary theory. Past research has linked regulatory focus to risky versus cautious decision strategies (Crowe & Higgins, 1997; Liberman, Idson, Camacho, & Higgins, 1999), whereas other research has explored women's and men's mating decision strategies in similar terms (Haselton & Buss, 2000). By using the present framework of regrets of inaction and action (i.e., regrets of omission vs. commission), future research may integrate these ideas more directly. The present research constitutes a preliminary assessment of sex differences in regret, and we expect that future research aiming at more specific aspects of this sex difference may be informed by each of these theoretical conceptions.

REFERENCES

- Alexander, M. J., & Higgins, E. T. (1993). Emotional trade-offs of becoming a parent: How social roles influence self-discrepancy effects. *Journal of Personality and Social Psychology*, *65*, 1259-1269.
- Buss, D. M., & Schmitt, D. P. (1993). Sexual strategies theory: An evolutionary perspective on human mating. *Psychological Review*, *100*, 204-232.
- Chen, J., Chiu, C. Y., Roese, N. J., Tam, K., & Ivy, Y. L. (2005). Culture and counterfactuals: On the importance of life domains. *Journal of Cross-Cultural Psychology*.
- Clark, C. L., Shaver, P. R., & Abrahams, M. F. (1999). Strategic behaviors in romantic relationship initiation. *Personality and Social Psychology Bulletin*, *25*, 707-720.
- Clark, R. D., & Hatfield, E. (1989). Gender differences in receptivity to sexual offers. *Journal of Psychology and Human Sexuality*, *2*, 39-55.
- Connolly, T., & Zeelenberg, M. (2002). Regret in decision making. *Current Directions in Psychological Science*, *11*, 212-216.
- Cross, S. E., & Madson, L. (1997). Models of the self: Self-construals and gender. *Psychological Bulletin*, *122*, 5-37.
- Crowe, E., & Higgins, E. T. (1997). Regulatory focus and strategic inclinations: Promotion and prevention in decision making. *Organizational Behavior and Human Decision Processes*, *69*, 117-132.
- Duncombe, J., & Marsden, D. (1995). "Workaholics" and "whingeing women": Theorising intimacy and emotion work—The last frontier in gender inequality? *Sociological Review*, *43*, 150-169.
- Elliot, A. J., & Thrash, T. M. (2002). Approach-avoidance motivation in personality: Approach-avoidance temperaments and goals. *Journal of Personality and Social Psychology*, *82*, 804-818.
- 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., Wang, R. F., Regan, D., & Nishina, S. (2003). Regrets of action and inaction across cultures. *Journal of Cross-Cultural Psychology*, *34*, 61-71.
- Grieve, F. G., Houston, D. A., Dupuis, S. E., & Eddy, D. (1999). Counterfactual production and achievement orientation in competitive athletic settings. *Journal of Applied Social Psychology*, *29*, 2177-2202.
- Haselton, M. G., & Buss, D. M. (2000). Error management theory: A new perspective on biases in cross-sex mind reading. *Journal of Personality and Social Psychology*, *78*, 81-91.
- Higgins, E. T. (1997). Beyond pleasure and pain. *American Psychologist*, *52*, 1280-300.
- Higgins, E. T. (1998). Promotion and prevention: Regulatory focus as a motivational principle. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 30, pp. 1-46). San Diego, CA: Academic Press.
- Higgins, E. T., Shah, J. Y., & Friedman, R. (1997). Emotional responses to goal attainment: Strength of regulatory focus as moderator. *Journal of Personality and Social Psychology*, *72*, 515-525.
- Janicki, M., & Krebs, D. L. (1998). Evolutionary approaches to culture. In C. Crawford & D. L. Krebs (Eds.), *Handbook of evolutionary psychology: Ideas, issues, and applications* (pp. 163-209). Mahwah, NJ: Lawrence Erlbaum.
- Kenrick, D. T., Ackerman, J., & Ledlow, S. (2003). Evolutionary social psychology: Adaptive predispositions and human culture. In J. DeLamater (Ed.), *Handbook of social psychology* (pp. 103-124). New York: Kluwer-Plenum.
- Kenrick, D. T., Groth, G. E., Trost, M. R., & Sadalla, E. K. (1993). Integrating evolutionary and social-exchange perspectives on relationships: Effects of sex, self-appraisal, and involvement level on mate selection criteria. *Journal of Personality and Social Psychology*, *64*, 951-969.
- Kenrick, D. T., Sadalla, E. K., Groth, G., & Trost, M. R. (1990). Evolution, traits, and the stages of human courtship: Qualifying the parental investment model. *Journal of Personality*, *58*, 97-116.
- Kenrick, D. T., Trost, M. R., & Sundie, J. M. (2004). Sex-roles as adaptations: An evolutionary perspective on gender differences and similarities. In A. H. Eagly, A. Beall, & R. Sternberg (Eds.), *Psychology of gender* (pp. 65-91). New York: Guilford.
- Landman, J., & Manis, J. D. (1992). What might have been: Counterfactual thought concerning personal decisions. *British Journal of Psychology*, *83*, 473-477.
- Lee, A. Y., Aaker, J. L., & Gardner, W. L. (2000). The pleasures and pains of distinct self-construals: The role of interdependence in regulatory focus. *Journal of Personality and Social Psychology*, *78*, 1122-1134.
- Li, N. P., Bailey, J. M., Kenrick, D. T., & Linsenmeier, J. A. W. (2002). The necessities and luxuries of mate preferences: Testing the tradeoffs. *Journal of Personality and Social Psychology*, *82*, 947-955.
- Li, N. P., & Kenrick, D. T. (in press). Sex similarities and differences in preferences for short-term mates: What, whether, and why. *Journal of Personality and Social Psychology*.
- Liberman, N., Idson, L. C., Camacho, C. J., & Higgins, E. T. (1999). Promotion and prevention choices between stability and change. *Journal of Personality and Social Psychology*, *77*, 1135-1145.
- Mandel, D. R., Hilton, D. J., & Catellani, P. (Eds.). (2005). *The psychology of counterfactual thinking*. London: Routledge.
- Markman, K. D., Gavanski, I., Sherman, S. J., & McMullen, M. N. (1993). The mental simulation of better and worse possible worlds. *Journal of Experimental Social Psychology*, *29*, 87-109.
- Morris, M. W., Moore, P. C., & Sim, D. L. H. (1999). Choosing remedies after accidents: Counterfactual thoughts and the focus on fixing "human error." *Psychonomic Bulletin and Review*, *6*, 579-585.
- Nasco, S. A., & Marsh, K. L. (1999). Gaining control through counterfactual thinking. *Personality and Social Psychology Bulletin*, *25*, 556-568.
- Pennington, G. L., & Roese, N. J. (2003). Counterfactual thinking and regulatory focus. In S. J. Spencer, S. Fein, M. P. Zanna, & J. M. Olson (Eds.), *Motivated social perception: The Ontario symposium* (Vol. 9, pp. 277-298). Mahwah, NJ: Lawrence Erlbaum.
- Roese, N. J. (1994). The functional basis of counterfactual thinking. *Journal of Personality and Social Psychology*, *66*, 805-818.
- Roese, N. J. (1997). Counterfactual thinking. *Psychological Bulletin*, *121*, 133-148.
- Roese, N. J. (2005). *If only*. New York: Broadway Books.
- Roese, N. J., Hur, T., & Pennington, G. L. (1999). Counterfactual thinking and regulatory focus: Implications for action versus inaction and sufficiency versus necessity. *Journal of Personality and Social Psychology*, *77*, 1109-1120.
- Roese, N. J., & Olson, J. M. (1993). The structure of counterfactual thought. *Personality and Social Psychology Bulletin*, *19*, 312-319.
- Roese, N. J., & Summerville, A. (2005). What we regret most . . . and why. *Personality and Social Psychology Bulletin*, *31*, 1273-1285.
- Roney, C. J. R., Higgins, E. T., & Shah, J. (1995). Goals and framing: How outcome focus influences motivation and emotion. *Personality and Social Psychology Bulletin*, *21*, 1151-1160.
- Smith, J. E. K. (1976). Data transformations in analysis of variance. *Journal of Verbal Learning and Behavior*, *15*, 339-346.
- Strazdins, L., & Broom, D. H. (2004). Acts of love (and work): Gender imbalance in emotional work and women's psychological distress. *Journal of Family Issues*, *25*, 356-378.
- Symons, D. (1979). *The evolution of human sexuality*. New York: Oxford University Press.
- Trivers, R. L. (1972). Parental investment and sexual selection. In B. Campbell (Ed.), *Sexual selection and the descent of man: 1871-1971* (pp. 136-179). Chicago: Aldine.
- Zeelenberg, M. (1999). The use of crying over spilled milk: A note on the rationality and functionality of regret. *Philosophical Psychology*, *12*, 325-340.
- Zeelenberg, M., van den Bos, K., van Dijk, E., & Pieters, R. (2002). The inaction effect in the psychology of regret. *Journal of Personality and Social Psychology*, *82*, 314-327.
- Zeelenberg, M., van Dijk, W. W., Manstead, A. S. R., & van der Pligt, J. (1998). The experience of regret and disappointment. *Cognition and Emotion*, *12*, 221-230.
- Zeelenberg, M., van der Pligt, J., & Manstead, A. S. R. (1998). Undoing regret on Dutch television: Apologizing for interpersonal regrets involving actions or inactions. *Personality and Social Psychology Bulletin*, *24*, 1113-1119.

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