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Counterfactuals, emotions, and context

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Participants recalled either a negative academic or interpersonal experience, and the relations among counterfactual thinking, negative emotions, and attributions of blame and control were examined. Situational context effects on attribution, counterfactual thinking, and emotion were observed, indicating a greater tendency toward self-focused cognition and emotion in the academic context than in the interpersonal context. Consistent with recent theorising, upward counterfactual thinking was associated with negative emotions of guilt, shame, regret, disappointment, and sadness. However, there was no indication that downward counterfactual thinking regulated emotion as previous literature suggests. Implications for functional and process theories of counterfactual thinking are discussed.

Negative experiences: We all have them from time to time. And when we do, we know it because they grab our attention, and do so better than their positive or neutral counterparts (for reviews, see Peeters & Czapinski, 1990; Taylor, 1991). They provoke emotional reactions, but they also make us think: For instance, about who or what was to blame, about how a negative outcome was caused and how it might have been prevented or controlled, perhaps even about how the outcome might have turned out worse (see Weiner, 1985). These ''red alerts'' make good evolutionary sense: Negative experiences usually represent disconfirmed expectancies (Olson, Roese, & Zanna, 1996) and, from a phenomenological viewpoint, they evoke surprise (Kahneman & Miller, 1986). The negative affect and arousal produced by ''bad experiences'' signals prediction failure, potential threat, and the need to plan more carefully for the future (Schwarz, 1990). Of course, emotions—positive or negative—also may

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systematically bias judgement and decision making in a number of ways (Schwarz, 2000).

COUNTERFACTUAL THINKING

One of the curious things that people sometimes do after a negative experience is to imagine ways in which it might have turned out differently. Psychologists call this *counterfactual thinking* because such thoughts focus on events that, in actual fact, did not happen (for reviews, see Roese, 1997; Roese & Olson, 1995a). It is worth noting that, although a counterfactual thought often represents a relation between two nonfactual events, the relation may still be factual. For instance, after Jane learns that she just passed an important exam, she might think something like ''If only I had studied harder, I might have done a lot better''. *De facto*, Jane did *not* study harder and did *not* do better, but the counterfactual proposition describing the *relation* between studying and exam performance may very well be true.[1] Perhaps the term *counteractual* would have been a better choice, but at this point we shall stick with the conventional term.

In this example, Jane is engaging in *upward* counterfactual thinking because she brought to mind a way in which a *better* outcome than that which was achieved might have been achieved (Markman, Gavanski, Sherman, & McMullen, 1993; McMullen, Markman, & Gavanski, 1995). Many have posited that upward counterfactual thinking—particularly, of the conditional ''if only'' variety—is highly adaptive (for reviews, see Roese 1997; Taylor & Schneider, 1989) and is governed by the same types of accuracy motives thought to underlie upward social comparison (e.g., Festinger, 1954). If-only thinking can be used as a heuristic for identifying conditions that were necessary for the relevant outcome to occur or that would have been sufficient to prevent it (Kahneman & Tversky, 1982; Mandel & Lehman, 1996; on sufficiency-necessity distinction, also see Mandel & Lehman, 1998). Such knowledge, which often focuses on how one personally might have controlled the outcome (Girotto, Legrenzi, & Rizzo, 1991; Markman, Gavanski, Sherman, & McMullen, 1995; Roese & Olson, 1995b), in turn, may help to generate plans aimed at preventing similar outcomes in the future (Johnson & Sherman, 1990; Nasco & Marsh, 1999; Roese, 1994; Taylor & Pham, 1996). Moreover, for future-focused individuals, the identification of causal factors that might optimise future outcomes can itself yield positive affect (Boninger, Gleicher, & Strathman, 1994).

Upward counterfactual thinking has its down side, however (Sherman & McConnell, 1995). Such thinking can amplify negative emotions (Gleicher et al., 1990; Kahneman & Miller, 1986) such as regret (Landman, 1987; Miller & Taylor, 1995; Zeelenberg et al., 1998b), shame (Niedenthal, Tangney, &

[1] I emphasise this point because it is sometimes claimed that counterfactual propositions are false (e.g., Roese, 1997, note 1), and this is not necessarily true.

Gavanski, 1994), guilt (Niedenthal et al., 1994), and distress (Davis, Lehman, Wortman, Silver, & Thompson, 1995). Upward counterfactual thinking also may increase the likelihood of attributing blame for not taking controllable measures that, in hindsight, could have prevented a negative outcome, even if the consequences were not predictable in foresight (Davis, Lehman, Silver, Wortman, & Ellard, 1996; Miller & Turnbull, 1990).

Negative experiences can also prompt *downward* counterfactual thinking in which worse possible worlds are imagined. For instance, Jane might have thought ''At least I didn't fail the exam''. By showing how things might have been worse (as with downward social comparisons; see Wills, 1981), such thoughts can make people feel relatively fortunate and satisfied (Johnson, 1986; Johnson & Sherman, 1990; Markman et al., 1993; Medvec, Madey, & Gilovich, 1995; Roese, 1994)—particularly dispositional optimists (Sanna, 1996, 1998). In some cases, however, downward counterfactuals may amplify negative affect. For example, if Jane had thought about the fact that she *almost* failed the exam, she may be more likely to experience anxiety than relief. Particularly if a threatening downward counterfactual scenario is perceived to have a reasonable chance of happening in the future (what Markman et al., 1993, refer to as high repeatability), then it may be more likely that such thoughts influence emotions via assimilation rather than contrast (McMullen & Markman, 2000).

THE PRESENT RESEARCH

Context effects

The present study examined the relations between counterfactual thinking and a range of emotional responses, including regret, disappointment, shame, guilt, anger, distrust, and sadness, as well as related attributional responses such as perceived control over, and blame for, the negative event. Of particular interest was the effect of situational context on these relations. Participants were asked to recall either a negative *interpersonal* experience or a negative *academic* experience, following which they answered a series of questions about their counterfactual thoughts, attributions, and emotions pertaining to the reported experience. These academic and interpersonal contexts were chosen for three reasons: First, they are highly relevant to the population sampled in this study (viz., students). Second, these contexts constitute relatively normal events. Much of the counterfactual literature, as Markman et al. (1993) noted, has examined either scenarios that focused on highly abnormal—indeed, sometimes unbelievable—negative events or real, but highly traumatic events (Davis et al., 1995, 1996) that, although important to understand, do not adequately represent the magnitude of everyday negative experiences that people encounter.

The third reason for choosing these contexts was that, compared with personal conflicts, academic setbacks were expected to prompt attributions to internal, controllable behaviours. For many academic setbacks, students may be

aware that *consensus* is low: The exam that *they* failed, for instance, was probably passed by most of the class. Low consensus information is consistent with internal attributions (Kelley, 1967). Moreover, most students know that academic institutions set the ''rules of the game'' and it is their responsibility to learn how to play by them. Students therefore are likely to see their actions as figural against a background of constraints that include the professor's actions (McGill, 1989; Miller & Gunasegaram, 1990). By contrast, people are apt to perceive interpersonal situations as being governed by principles of cooperation, fairness, and reciprocity. Unlike in academia, there is a sense in which the rules of the game ought to be informally, and concurrently, set by the various individuals involved. When interpersonal conflicts arise, people, each with their own egocentric focus, may be likely to defensively attribute responsibility and blame to others (Shaver, 1970). Therefore, it was predicted that perceived control and self-blame would be much stronger in the academic context than in the interpersonal context.

Emotion specificity

Recently, some researchers (Lerner & Keltner, 2000; van der Pligt, Zeelenberg, van Dijk, de Vries, & Richard, 1998) have noted that most of the work examining relations between emotion and cognition has taken a valence-based perspective, emphasising broad distinctions between positive and negative emotions rather than examining specific emotions. This is an important point because different emotions that share the same valence may be influenced by, and influence, judgement and choice in disparate ways. For instance, whereas fear tends to prompt pessimism, anger tends to prompt optimism (Lerner & Keltner, 2000).

The self-other dimension of appraisal is fundamental to emotional response (Weiner, 1986), and it provides a basis for refining valence-based notions, such as Kahneman and Miller's (1986) *emotional amplification* hypothesis, which states that upward counterfactuals will tend to heighten negative emotion, whereas downward counterfactuals will tend to heighten positive (or lessen negative) emotion. It seems likely, however, that the degree of amplification will depend on the specific emotion examined. Specifically, it was predicted that self-focused cognition (e.g., self-implicating counterfactuals, self-blame, and perceived self-control) would be directly related to self-focused negative emotions (e.g., regret, shame, and guilt) but inversely related to other-focused negative emotions (e.g., anger and distrust). Therefore, modulation of emotional intensity was expected to be the effect, in general, of counterfactual thinking on emotion. However, whether the effect amplifies or attenuates emotions was expected to depend on the degree of coherence between the

appraisal structure of the relevant cognitions, on the one hand, and the focal emotion, on the other.

Because anger tends to be elicited by external attributions of responsibility for negative outcomes (Keltner, Ellsworth, & Edwards, 1993), I predicted that self-blame and self-focused upward counterfactuals would be inversely related to anger intensity (and also distrust). Although such relations would violate the emotional amplification hypothesis from a valence-based perspective, these emotional attenuation effects are reasonable predictions from an emotion-specific perspective. Considerable research also suggests that regret is a self-focused emotion, linked to appraisals of personal responsibility and control (e.g., Frijda, Kuipers, & ter Schure, 1989; Ordóñez & Connolly, 2000; van Dijk, Zeelenberg, & van der Pligt, 1999; Zeelenberg, van Dijk, Manstead, & van der Pligt, 1999, 2000; Zeelenberg, et al., 1998b). In a related vein, research suggests that guilt and shame, although differing in their focus on behavioral versus characterological features, both are self-focused emotions (Niedenthal et al., 1994). Thus, it was expected that the availability of self-focused cognitions would directly predict the intensity of these emotions, consistent with the emotional amplification hypothesis.

In a number of Zeelenberg et al.'s studies, participants are asked to recall an experience that made them feel either extreme regret or extreme disappointment. Their research indicates that regret is evoked by comparisons with what one might have done differently to improve the situation, whereas disappointment is evoked by comparisons with better possible states of the world. The present experiment, by contrast, constrained participants' recalled events by situational context, not by emotion, thus permitting a clear test of two emotion-specific hypotheses. First, Zeelenberg et al. (1998a) hypothesised that ''disappointment is the more general emotion and that regret is experienced in cases where the disappointing outcome is attributed to the self'' (p. 229). Second, Zeelenberg et al. (1998b) hypothesised that, compared with disappointment, regret is more closely related to guilt and shame ''because regret, guilt and shame all share a sense of responsibility for the negative outcome or event'' (p. 124).

Two emotion-specific hypotheses concerning guilt and shame also were tested. Niedenthal et al. (1994) demonstrated that guilt was more likely to follow from counterfactuals that mutate controllable behaviours, whereas shame was more likely to follow from counterfactuals that mutate relatively uncontrollable, characterological features of oneself. Niedenthal et al. (1994) further hypothesised that guilt is a more common emotion than shame because it is easier to mutate guilt-inducing behaviours than shame-inducing dispositions, but that shame may be experienced more intensely than guilt. Their methodology, however, did not allow them to test these hypotheses, but the present experiment is well designed to do so.

Counterfactual generation

An additional focus of this research was to examine how counterfactuals are generated. The two-stage model of counterfactual generation (Roese, 1997; Roese & Olson, 1995a) posits that the initial availability (or *activation*) of counterfactual thinking is influenced primarily by negative affect but not by counterfactual content, which is filled in at the second stage and influenced by ''mutability factors'' such as abnormality, controllability, and the psychological closeness of plausible alternatives to an actual event (for a review of mutability factors, see Roese, 1997). This model provides an important theoretical distinction between activation and content that has been obscured in much of the extant literature. The present research nevertheless calls into question whether activation is as content-free a process as the two-stage model proposes.

The notion that counterfactual activation is a content-dependent process coheres with norm theory (Kahneman & Miller, 1986), which predicts that counterfactual thinking will be prompted by norm (or expectancy) violations. Indeed, the hedonic valence of an event is largely determined by prior expectancies and post-hoc ''mental accounts'' (Mandel, Lehman, & Ross, 2001; Thaler, 1985). These schematic forecasts and interpretations are inseparable from content. As noted earlier, the norms that shape expectancies, behaviour, and emotional response to outcome information vary across contexts. If so, then salient contextual features should not only shape the content of counterfactuals but also the likelihood that they are activated. Thus, it was predicted that upward counterfactuals will be more frequent in the academic rather than interpersonal context and, moreover, that this difference will be associated with a greater frequency of self-focused upward counterfactuals in the former context than in the latter.

METHOD

Participants and Design

A total of 100 (54 male, 46 female) undergraduates from the University of Hertfordshire (UK) participated in the experiment in response to a verbal request to complete a questionnaire on negative life experiences. The study had a two-group (Context: academic, interpersonal) between-subject design. Each condition had 50 participants and the ratio of males to females was the same in the two conditions.

Procedure

On the basis of random assignment, participants were asked to think about either a negative interpersonal experience (e.g., problems with a friend, partner, or family member) or a negative academic experience (e.g., failing an exam or

having problems with a professor) that they had encountered. Participants were given eight blank lines to describe the experience. Then, participants rated the personal significance of the experience on a scale ranging from *not at all significant* (0) to *extremely significant* (8). On the next page of the questionnaire, participants rated the degree to which the experience had made them feel sadness, disappointment, anger, distrust, guilt, shame, and regret on scales ranging from *not at all* (0) to *extremely* (6). On the third page of the questionnaire, participants read that when people experience negative events, they sometimes think about how the event might not have happened *if only* something had been different, and they were asked if they ever had such thoughts regarding the negative experience they recalled. Participants who responded affirmatively were asked to write down their thoughts. Participants also were asked a downward counterfactual question—namely, if they had ever thought about how the experience might have turned out worse than it actually did. Upward and downward counterfactual availability was measured by the proportion of participants who provided affirmative responses to these two counterfactual questions, respectively. Negative responses were dummy coded as 0 and affirmative responses, as 1. On the last page of the questionnaire, participants rated on a scale ranging from *not at all* (0) to *totally* (8) how much they blamed themselves, how much they blamed another individual for the negative experience, and how much control they thought they had over the experience.

RESULTS

Content of Experiences

Of the participants who recalled a negative interpersonal experience, 46% described a conflict with a friend, 27% described a family conflict, and 27% described a problem with an intimate relationship. Of the participants who recalled a negative academic experience, 70% described a specific problem with an exam or assignment, 6% described a problem with a professor, and the remaining 24% provided responses that were difficult to group into specific categories because the descriptions were vague (e.g., ''had problems with a course'').

Perceived significance of experiences

On average, participants viewed their recalled experiences as very significant (viz., the anchor corresponding to a rating of 6 on the relevant scale; $M = 5.91$, $SD = 1.96$). Mean perceived significance did not differ significantly as a function of situational context, gender, or the availability or either upward or downward counterfactuals (all ts < 1). Nor was perceived significance correlated with either upward or downward counterfactual availability, perceived control, or blame (rs range from $-.08$ to .11). However, as Table 1 shows, there was a

TABLE 1
Correlations among emotions, attributions, and counterfactuals

	1	*2*	*3*	*4*	*5*	*6*	*7*
1. Anger							
2. Distrust	.31**						
3. Disappointment	.11	.11					
4. Sadness	.19	.04	.45**				
5. Guilt	.01	−.20*	.09				
6. Shame	.07	−.17	.05	.23*	.65**		
7. Regret	−.10	−.10	.33**	.34**	.52**	.56**	
Significance	.24*	.26**	.39**	.44**	.09	.23*	.32**
Control	−.23*	−.34**	.19	.11	.29**	.23*	.41**
Blame	−.27**	−.53**	.13	.14	.54**	.41**	.51**
UCF	−.08	−.06	.13	.29**	.22*	.28*	.36**
Self UCF	−.09	−.15	.23*	.14	.36**	.40**	.44**
DCF	−.04	.00	.10	−.07	.16	.21*	.12
$M_{academic}$	3.61	1.76	4.49	3.51	2.43	2.80	3.46
$SD_{academic}$	2.19	2.13	1.92	1.93	1.89	2.10	2.00
$M_{interpersonal}$	4.20	2.94	4.14	3.28	1.08	1.02	1.70
$SD_{interpersonal}$	1.84	2.34	1.69	2.15	1.75	1.77	2.10
$M_{overall}$	3.91	2.35	4.31	3.39	1.75	1.90	2.57
$SD_{overall}$	2.03	2.30	1.81	2.03	1.93	2.13	2.22

UCF, upward counterfactual availability; Self UCF, self-focused upward counterfactual availability; DCF, downward counterfactual availability. $df = 98$, *$p < .05$; **$p < .01$, two-tailed.

significant direct relation between perceived significance and each negative emotion, except guilt.

Context effects

Perceived control and blame. As predicted, perceived control was significantly greater in the academic context ($M = 5.28$) than in the interpersonal context ($M = 3.08$), $t(98) = 4.97$, $SE = 0.44$, $p = .000$. Next, the self- and other-blame ratings were analysed in a 2 (Blame Focus) × 2 (Context) mixed ANOVA. As shown in Table 2, the predicted interaction effect was significant, $F(1, 98) = 43.92$, $MS_e = 10.38$, $p = .000$. *Post-hoc* tests ($\alpha = .01$) revealed that, on average, participants in the *academic* condition blamed themselves more than others, whereas participants in the *interpersonal* condition displayed the opposite pattern.

Counterfactual thinking. Consistent with past research (e.g., Roese & Olson, 1995b, 1997), 72% of participants reported upward counterfactuals, whereas significantly fewer participants (44%) reported that they had thought

TABLE 2
Mean blame ratings as a function of blame focus and context

	Context	
Blame focus	*Interpersonal*	*Academic*
Self	2.44	5.46
Other	5.31	2.34

about how their experiences might have turned out worse, McNemar test $p < .001$. However, as Table 3 shows, the overall pattern is qualified by a context effect. Specifically, upward counterfactuals were reported significantly more frequently than downward counterfactuals in the academic context (McNemar test $p < .001$), but the difference in reported frequency of upward versus downward counterfactuals was nonsignificant in the interpersonal context. As Table 3 also shows, the effect of context on the association between counterfactual availability and counterfactual direction is due to differences in the reported availability of upward, but not downward, counterfactuals: Whereas 56% of participants in the *interpersonal* condition reported upward counterfactuals, as many as 88% of participants in the *academic* condition reported such thoughts, $\chi^2(1, N = 100) = 12.70$, $p < .001$. By contrast, downward counterfactual availability was independent of context, $\chi^2(1, N = 100) = 1.46$, $p > .22$.[2]

TABLE 3
Number of participants reporting counterfactuals as a function of counterfactual direction and context

	Context	
Counterfactual Direction	*Interpersonal*	*Academic*
Upward		
Available	28	44
Unavailable	22	6
Downward		
Available	25	19
Unavailable	25	31

[2] Note also that the frequencies of upward and downward counerfactuals were independent of each other, $\chi^2(1, N = 100) < 1$.

To test the prediction that counterfactual availability is influenced by context-related content effects, the first thoughts listed by the 72 participants who reported upward counterfactuals were coded by two independent raters in terms of whether the content focused on: (a) the participant's role (e.g., ''If only I had put more effort into working instead of other extra-curricular activities' such as going out and enjoying myself''); (b) the role of other individuals (e.g., ''If only my mum could think rationally'', ''If only someone else was there too, they could have stopped him from hitting me''); or (c) some other factor (e.g., ''If only things were different'', ''If only society was more open'').[3] Upward counterfactual content was nonindependent of context, $\chi^2(2, N = 72) = 20.19$, $p < .001$. Whereas only 39% of upward-counterfactual reporters who recalled an interpersonal experience generated self-focused counterfactuals, the vast majority (89%) of their counterparts who recalled an academic experience generated self-focused counterfactuals (see Table 4). Thus, the greater availability of upward counterfactual thinking in the academic versus interpersonal context can be accounted for by the greater proportion of self-focused counterfactuals reported in the former context. Indeed, a hierarchical logistic regression analysis revealed that context remained a significant predictor of upward counterfactual availability even after adjusting for a composite measure of negative emotion (for emotion, $B = 0.61$, $p = .018$; for context, $B = 1.56$, $p = .004$). Indeed, it was a stronger predictor than emotion. This finding is of theoretical importance because Roese (1997) posits that negative emotion is the primary factor that influences counterfactual availability.

Emotions. In the next set of analyses, differences in the extremity of specific emotions within and across contexts were examined. A 2 (Context) × 7 (Emotion) mixed ANOVA revealed a significant main effect of context: Overall emotional extremity was greater in the academic context ($M = 3.15$) than in the

TABLE 4
Number of participants reporting upward counterfactuals as a function of counterfactual focus and context

	Context	
Counterfactual focus	*Interpersonal*	*Academic*
Self	11	39
Other person	10	4
Other factor	7	1

[3] Agreement was reached in 90% of the cases, and disagreements were resolved by the author.

interpersonal context ($M = 2.62$), $F(1, 97) = 5.86$, $MS_e = 8.26$, $p < .02$. The main effect of emotion also was significant, $F(6, 92) = 26.49$, $p = .000$ (see Table 1 for means). However, the main effects were qualified by a significant interaction effect, $F(6, 92) = 5.09$, $p < .001$. To clarify the nature of this interaction, I conducted a one-way (Context) MANOVA on the seven measures of emotion. The univariate results revealed that, compared with participants in the *interpersonal* condition, participants in the *academic* condition felt more guilt, $F(1, 97) = 13.57$, $MS_e = 3.32$, $p < .001$, more shame, $F(1, 97) = 20.75$, $MS_e = 3.76$, $p < .001$, more regret, $F(1, 97) = 18.18$, $MS_e = 4.25$, $p < .001$, and less distrust, $F(1, 97) = 6.94$, $MS_e = 5.01$, $p = .01$. Therefore, consistent with the prediction that negative academic experiences would heightened self-focused cognitions, these experiences were also especially likely to heighten *self-focused* emotions (viz., guilt, shame, and regret), whereas negative interpersonal experiences heightened the *other-focused* emotion of distrust (as Table 1 shows, anger was greater in the interpersonal context than the academic context, although the difference fell short of significance).

Relations among attributions, counterfactuals, and emotions

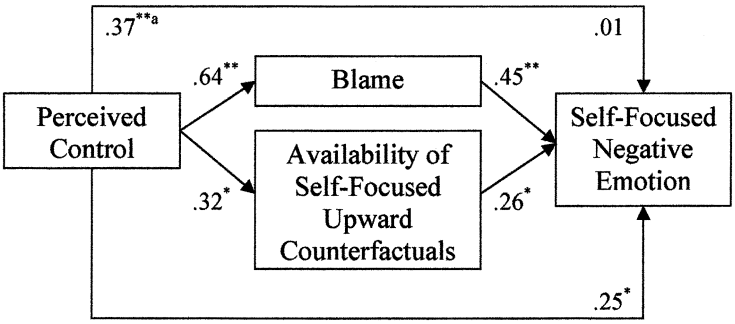
Self versus other focus. As shown in Table 1, which presents the correlations among the emotions, attribution ratings, and counterfactuals, perceived control and blame exhibited similar patterns of relations with emotion.[4] In support of both the emotional-amplification and emotional-attenuation hypotheses, both perceived control and blame were correlated positively with self-focused emotions of guilt, shame, and regret, and both of these attributional measures were correlated negatively with other-focused emotions of anger and distrust. Also confirming predictions, the presence of self-focused upward counterfactual thinking was associated with higher levels of each of the self-focused emotions measured in this study (viz., guilt, shame, and regret) as well as with disappointment. Indeed, each of these emotions were correlated more strongly with self-focused upward counterfactuals than with upward counterfactuals in general. By contrast, the only emotion that was significantly correlated with upward counterfactuals, in general, but not with self-focused upward counterfactuals, in particular, was sadness. The difference between these correlations was marginally significant, $t(97) = 1.77$, two-tailed $p = .077$.

Mediational analyses. Although past literature (e.g., Roese & Olson, 1997) suggests that both counterfactual and attributional thinking can influence

[4] Self- and other-blame were inversely correlated, $r(98) = -.79$, $p < .001$, and were combined into a composite measure in which higher values indicate a tendency toward self-blame.

emotion, little research has simultaneously assessed multiple predictors or examined possible mediational effects. To examine the prediction of self-focused emotion (a composite measure of guilt, shame, and regret) from attributional and counterfactual thinking, an exploratory, hierarchical regression analysis with control, blame (see footnote 4), and self-focused upward counterfactual availability as predictors was conducted. The final model included blame ($\beta = .45$, $p < .001$) and self-focused upward counterfactual availability ($\beta = .26$, $p = .006$) as significant predictors, $F(2, 96) = 29.79$, $MS_e = 2.22$, $p < .001$. Next, a mediational analysis following the recommendations of Baron and Kenny (1986) was conducted to determine whether these predictors mediated the relation between control and self-focused emotion. As Figure 1 shows, control significantly predicted both potential mediators and the criterion when the mediators were not controlled. Blame fully mediated the relation between control and self-focused emotion and self-focused counterfactual availability partially mediated that relation.

Downward counterfactuals. Downward counterfactual availability was not correlated with either perceived control or blame (both rs = −.01). Moreover, contrary to current functional accounts (e.g., Markman et al., 1993; Roese, 1994), downward counterfactual availability was not inversely related to a single negative emotion at a magnitude approaching significance (see Table 1). Indeed, the only significant finding ran counter to expectation: Participants who generated downward counterfactuals tended to report feeling a stronger sense of shame than those who did not have such thoughts.



*$P < .005$, **$P < .0005$ (one-tailed).
[a]Beta for unmediated relation.

Figure 1. Mediational model of self-focused emotional amplification.

Additional emotion-specific hypothesis tests

Disappointment and regret. According to Zeelenberg et al. (1998b), upward counterfactual availability should be more closely related to feelings of regret than disappointment because counterfactuals tend to focus on personally controllable behaviours and regret tends similarly to be evoked by comparisons with better possible worlds brought about via agentic means. Supporting this notion, self-focused upward counterfactual availability was more strongly correlated with regret than disappointment, $t(97) = 2.00$, one-tailed $p = .024$ (see Table 1). The present findings also supported the prediction of Zeelenberg et al. (1998b) that, compared with disappointment, regret is more closely related to guilt and shame: As Table 1 shows, regret was significantly related to shame and guilt (mean $r = .54$), whereas disappointment was not significantly related to either shame or guilt (mean $r = .07$). Moreover, supporting the notion that the self-other distinction exerts an important influence on the structure of emotion, regret did not correlate as strongly with disappointment as with guilt $t(97) = 1.72$, one-tailed $p = .044$, or shame, $t(97) = 2.13$, one-tailed $p = .018$). To test the hypothesis of Zeelenberg et al. (1998a) that disappointment is a more general emotion than regret, the percentages of participants who indicated at least some regret and disappointment were examined. Confirming the prediction, a greater percentage of participants indicated experiencing some disappointment (95%) than some regret (65%), McNemar test $p < .001$.

Guilt and shame. As shown earlier (see Table 1), upward counterfactual availability, particularly when it is self-focused in content, is directly related to both guilt and shame. However, contrary to Niedenthal et al.'s (1994) prediction that counterfactual thinking may be more closely related to guilt than to shame, no significant difference in the magnitude of these correlations was observed regardless of whether upward counterfactuals in general or self-focused upward counterfactuals in particular were examined, ts < 1. To test the Niedenthal et al.'s (1994) hypothesis that guilt is a more common emotion that shame, the percentages of participants who indicated experiencing some guilt and shame were examined. The findings did not support the hypothesis: 59% of the sample reported experiencing some shame and 62% reported experiencing some guilt, McNemar test $p = .84$. To test the same authors' hypothesis that shame is experienced more intensely than guilt, mean estimates of shame and guilt were compared for the subsample who reported experiencing both emotions. Contrary to the prediction, the mean difference was nonsignificant, paired $t(46) < 1$.

DISCUSSION

This research examined attributional, counterfactual, and emotional responses to real experiences that participants viewed as very significant events in their lives.

Participants tended to focus on either interpersonal conflicts with family, friends, and relationship partners that people commonly experience or negative academic pitfalls that most students experience at some point during their formal education. The findings highlight the importance of examining people's reactions to real events across different situational contexts. In this study, context influenced the types of counterfactuals, attributions, and emotions that were reported by students. Negative academic experiences produced considerably more perceived outcome control, self-blame, self-focused upward counterfactual thinking, and self-focused emotion than negative interpersonal experiences. The findings indicate that a rich descriptive account of how cognition and emotion interact requires that researchers pay close attention to, and sample from, the real contexts in which these psychological attributes, and their underlying processes, are manifested. Structure is not only in human minds, it is also in the environment. Although the contexts manipulated in the present study were chosen with the student sample in mind, it will be important for future research to sample from other populations for whom different situational contexts may be more relevant. Similarly, the generalisability of participants' responses may also be profitably examined. The ''love-work'' dimension examined in the present research could be generalised to other negative events (e.g., marriage conflicts, divorce vs. setbacks in the workplace) as well as to positive events (a surprisingly positive social encounter vs. an occasion of work excellence).

Attributions, counterfactuals, and emotions

The present findings cohere strongly with past research demonstrating that upward counterfactual thinking is associated with attributions of controllability (e.g., Girotto et al., 1991; Mandel & Lehman, 1996; Markman et al., 1995; Roese & Olson, 1995b; cf. Nasco & Marsh, 1999) and self-blame (e.g., Davis et al., 1996; Miller & Gunasegaram, 1990; Miller & Taylor, 1995; N'gbala & Branscombe, 1995). These findings add an important clarification, however. It is *self-focused* upward counterfactual thinking—thinking that specifies how one personally could have changed a negative outcome for the better—that underlies the counterfactual-attribution relation. Whether counterfactual and attributional thinking relate because of its structural properties (e.g., counterfactual conditionals may spotlight causes) or because of similarities in the underlying dimensions (e.g., internal-external and controllable-uncontrollable) of counterfactual and attributional content is a question for future research. Most literature on the topic has emphasised the former explanation (for a review, see Spellman & Mandel, 1999). However, the present findings suggest that the latter explanation should be seriously considered.

The present research clearly indicates the importance of taking an emotion-specific rather that merely valence-based approach. Consistent with past accounts (e.g., Weiner, 1986), the attributional effects of counterfactual think-

ing, perceived control, and blame assignment on emotion fell along a self-other dimension. Specifically, perceived control, fully mediated by attributions of self-blame, directly predicted a composite measure of self-focused emotion. Providing an important clarification Kahneman and Miller's (1986) emotional amplification hypothesis and subsequent research showing a link between counterfactual thinking and emotion, the present findings showed that *self-focused* negative emotions are the most likely to be amplified by upward counterfactual thinking (see also Zeelenberg et al. 1998b). Due to the valence-based focus of research in this area, however, it has not been acknowledged that an *emotional attenuation effect* also may occur. In support of the latter effect, self-blame was inversely related, and counterfactual thinking was unrelated, to other-focused emotions of anger and distrust.

The mediational analyses also shed light on the probable causal pathways linking attribution and counterfactual thinking to emotion. Blame mediated the relation between perceived control and self-focused negative emotion. One explanation for this effect is that perceived control, unlike self-blame (Shaver, 1985), need not be coupled with the perception that the relevant behaviour-outcome link was *foreseeable*. Supporting this interpretation, Davis et al. (1996) found that, among a sample of respondents with spinal cord injuries, the perceived foreseeability of the injury directly predicted self-blame. The nagging sense often associated with self-blame that one ought to have known better may be an important intervening step between basic perceptions of control and the emotional consequences of such perceptions. According to Roese (1997), upward counterfactual thinking can amplify emotional reactions to negative events by spotlighting causes, which heighten the sense that the outcome was not inevitable, may have been controllable, and should have been foreseeable, or, alternatively, by increasing negative contrast. The predictive effect of counterfactual availability on self-focused negative emotion, controlling for self-blame, coheres with the idea of an independent effect of negative contrast.

Functional implications

Functional accounts (e.g., Markman et al., 1993; Roese, 1994) propose that a cost of upward counterfactual thinking is the amplification of negative emotions, whereas a benefit of downward counterfactual thinking is the alleviation of such emotions. This anticipated pattern of emotional response has been called the *affective contrast effect* (McMullen & Markman, 2000; Roese, 1994) because it is predicted that hedonic response is directed away from the valence of the imagined alternative. This study examined a broad range of reported negative emotions and partial support for the affective contrast effect was observed. Specifically, it was found that upward counterfactual thinking was associated with more extreme feelings of several negative emotions: Corroborating Niedenthal et al. (1994), upward counterfactual thinking was related to more

extreme feelings of shame and guilt; corroborating Zeelenberg et al. (1998b), upward counterfactual thinking was related to more extreme feelings of regret and disappointment; and corroborating Davis et al. (1995), upward counterfactual thinkers felt relatively more sad. More generally, as noted earlier, the findings provide qualified support for the emotional amplification hypothesis (Kahneman & Miller, 1986), and strong support for the more general *emotional modulation* effect, particularly given that each participant recalled a distinct personal experience and because the results were pooled from two distinct experiential contexts.

The present findings, however, did not support the notion that downward counterfactual thinking serves an affect regulation function (e.g., Markman et al., 1993). Downward counterfactual thinking was not associated with an attenuation of negative emotion for even one out of the seven emotions examined in this study. These findings cast doubt on the notion that downward counterfactual thinking has a robust ameliorative effect on emotion. One explanation for this inconsistency with past functional theorising is suggested by the recent work of McMullen and Markman (2000). They showed that downward counterfactual thinking can influence emotion via two distinct mechanisms: *assimilation* and *contrast*. Earlier functional accounts have emphasised the contrast mechanism and accordingly predict that downward counterfactual contrasts will make people feel better about their predicament by showing themselves that it is not so bad in relative terms. Downward counterfactual assimilation, on the other hand, occurs when people's thoughts of how things could have turned out worse serve as a ''wake-up call'' signalling that one's behaviour and planning may be inadequate to meet current expectations and goals. Moreover, assimilation effects are expected to be particularly likely in contexts, such as those examined in this study, that are characterised by high repeatability (see Markman et al., 1993) because assimilative reassessments of how things could have been worse might benefit planning for the future.

Implications for process accounts of counterfactual thinking

Corroborating earlier research (e.g., Nasco & Marsh, 1999; Roese & Olson, 1995b, 1997; Sanna, Turley-Ames, & Meier, 1999), this study found that upward counterfactuals are more frequent than downward counterfactuals following negative experiences. In this study, the incidence of the former was 1.6 times that of the latter. As predicted, however, counterfactual availability varied as a function of the interaction between counterfactual direction and situational context. Only in the academic context was upward counterfactual thinking more likely than downward counterfactual thinking. This was due to that fact that participants were 1.6 times more likely to report upward counterfactuals following an academic rather than interpersonal experience.

Moreover, *only* in the academic context did the vast majority of such thoughts have *self-focused* content. In fact, the incidence of self-focused counterfactuals was 3.5 times greater for those who recalled an academic rather than interpersonal experience. It also was in the academic context that participants perceived greater self-control over their experiences, and these perceptions of control were directly related to the presence of self-focused counterfactual content.

Taken together, this pattern of findings casts some doubt on the notion that counterfactual activation depends on valence but not content (Roese, 1997). Rather, the findings suggest that counterfactual activation is a content-dependent process that is influenced by salient features of the experience being mentally undone. Consistent with past research (Roese & Olson, 1997; Sanna et al., 1999), negative emotion was a direct predictor of upward counterfactual availability. However, situational context was a stronger predictor of upward counterfactual availability than negative emotion in this study. Nevertheless, due to the self-report and memory-based response elicitation methods employed in this study, a pure test of the effect of content and situational context on the activation process using more traditional approaches (e.g., lexical decisions, reaction time tests, word-stem completions) should be pursued in future research.

The notion that counterfactual activation is a content-dependent process is consistent with norm theory (Kahneman & Miller, 1986), which predicts that counterfactual thinking will be prompted by expectancy violations. Norms and expectancies are rich in content and vary across situational contexts. When an actual outcome contrasts negatively with expectation, it also produces negative hedonic reactions, much like a loss that follows a gain feels worse than a loss that follows a neutral outcome (Tversky & Griffin, 1991). Stated differently, disconfirmed expectancies assume the role of counterfactual reference points that amplify negative affect via contrast (Mandel et al., 2001; Medvec et al., 1995). Subsequent counterfactual thinking then may explore causal pathways that mentally reconcile outcomes with disconfirmed expectancies *post hoc*. Such thinking may be driven by more basic neural mechanisms designed to restore cognitive resonance (Grossberg & Stone, 1986) or explanatory coherence (Thagard, 1989) even at the cost of increasing the persistence of negative contrast effects. The functional benefit of such mechanisms is learning, which, if effective, should increase the likelihood of expectancy-outcome coherence in the future.

Limitations

A final word on the limitations of this research is in order. First, this research involved analysing *recollections* of cognitive and emotional responses to past experiences. The process of recollecting may have biased both the types of events that participants recalled and, perhaps more significantly, the cognitions

and emotions that they recalled. Future research could clearly benefit by using on-line tasks to examine similar issues, which could be compared with the results of memory-based tasks such as the present one (for a review of this task distinction, see Hastie & Park, 1986). Second, given the correlational nature of many of the findings in this study, the standard caveat about drawing causal inferences applies. In particular, the mediational analyses reported should be treated as a preliminary step in developing an account of the causal relations between specific cognitive and emotional responses—not as a final statement about them. There is still no good substitute for the triangulation of evidence from studies that use a variety of experimental and data-analytic methods.

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