In two studies participants were asked to make a decision about whether they would hire a job applicant described in a fictitious vita. Later, participants were shown the vita of a second applicant and rated the extent to which they regretted their original decision. Participants who were mildly depressed reported higher levels of regret than non–depressed participants. This heightened regret level was observed: (1) regardless of whether participants had decided to hire the initial candidate; (2) independently of whether the decision had high or low personal relevance to participants; and (3) regardless of the extent to which the second candidate was a better candidate for the job than the first applicant. The results of causal modeling analyses suggest that the construct of depression predicts these regret results independently of related constructs, such as locus of control or causal uncertainty.

This project was instigated as a part of the first author’s senior honors thesis. The second author (J.J. Skowronski) supervised the thesis, and the third author (Wm. MacDonald) was one of the examining committee members. We thank Judith Johnson for her willingness to also serve on the examination committee. We thank Gifford Weary for her assistance in clarifying relations between locus of control, causal uncertainty and depression, and for her comments on an earlier draft of this manuscript. We thank the many reviewers of this manuscript for their careful examination of the manuscript and for their suggestions for improving it.

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A growing body of literature indicates that mildly depressed individuals engage in a more effortful, extensive analysis of social information than non–depressed individuals (e.g., Dobson & Dobson, 1981; Edwards & Weary, 1993; Ellis, Thomas, & Rodriguez, 1984; Gleicher & Weary, 1991; Hildebrand–Saints & Weary, 1989; Lassiter, Koenig, & Apple, 1996; Weary, Marsh, Gleicher, & Edwards, 1993). Weary and her colleagues (1993) have suggested that this heightened cognitive diligence is a consequence of chronic causal uncertainty. That is, the mildly depressed routinely feel uncertain about their ability to understand, predict, and control their social world. This chronic uncertainty leads the mildly depressed to adopt an accuracy goal in information processing and prompts heightened processing diligence.

However, the bulk of the research in this area has focused on differences in how the mildly depressed and the non–depressed search for and use information in decision–making (see Conway & Giannopolous, 1993; Costello, 1983; Pietromonaco & Rook, 1987; Radford, Mann, & Kalucy, 1986). Relatively little research has focused on how the mental consequences of these decisions might differ for the mildly depressed and the non–depressed.

For example, what would happen if an individual made a decision, then was confronted with an attractive new option that might cause that initial decision to be reconsidered? One possibility is that the individual might feel *regret* over the initial decision. According to regret theory, regret is a counterfactual emotion that stems from a comparison between what is and what might have been (Bell, 1982; Loomes & Sugden, 1982). A relatively general consensus seems to be that regret involves the experience of distress and sorrow for misfortunes, limitations, losses, transgressions, shortcomings, or mistakes (Hampshire, 1960; Landman, 1987, 1993; Rorty, 1980; Zeelenberg, van Dijk, Manstead, & van der Plight, 2000). Regret often occurs when people take actions that turn out badly (and when other options were available), but it can also occur when people fail to take action (see Gilovich & Medvec, 1995a, 1995b; Zeelenberg, van den Bos, van Dijk, & Pieters, 2002).

Although social psychology has long been concerned with the study of this kind of post–decisional regret (e.g., Festinger & Walster, 1964; Knox & Inkster, 1968) few studies have directly investigated differences between the mildly depressed and the non–depressed in terms of the degree to which they experience post–decisional regret. There are several reasons to suspect that such a difference exists and that the mildly depressed might experience more post–decisional regret than the non–depressed. The first of these reasons comes from research suggesting that depression and general feelings of regret are correlated (Lecci, Okun, & Karoly, 1994). This correlation may exist because the mildly depressed
are more likely to think about post–decision alternatives than the non–depressed, and this rumination could cause the generation of regret. Markman and Weary (1998) suggest that chronic control concerns cause depressives to be more likely to generate counterfactuals. Markman and Weary argue that negative affect and self–blame can be an undesirable by–product of cognitions directed toward the attainment and re–establishment of control perceptions.

This speculation is consistent with the literature examining regret. The results of research have frequently shown that regret is a consequence of preoccupation with comparing one’s chosen alternative to a second, non–chosen alternative (e.g., see Festinger, 1964; Gilovich & Medvec, 1995a, 1995b; Kahneman & Tversky, 1982). Research demonstrates that thinking about how outcomes could have been better (the generation of upward counterfactuals – see Roese, 1997) is, indeed, linked to feelings of regret (Johnson, 1986; Landman, 1987). Mildly depressed individuals are more likely to generate upward counterfactuals for events than those who are not depressed, especially when the events are potentially controllable and may happen again (Markman & Weary, 1996). A similar effect occurs for individuals who are low in self–esteem, which is a component of depression (Kasimatis & Wells, 1995; Roese & Olsen, 1993), and for individuals experiencing negative affect (Roese & Hur, 1997). Although these counterfactual generation studies did not directly measure regret, the implications are clear: If the mildly depressed generate more upward counterfactuals than the non–depressed, and if the generation of upward counterfactuals leads to the emotion of regret, then the mildly depressed ought to experience more post–decisional regret than the non–depressed.

A second set of studies that is suggestive of greater regret in the mildly depressed than the non–depressed comes from research into impression formation. In a series of studies, Gannon, Skowronski and their colleagues (Gannon, Skowronski, & Betz, 1994; Skowronski, Gannon, Monroe, & Wood, 2005) have found that the mildly depressed are more receptive to later–occurring information in an impression formation task than the non–depressed. One of the mechanisms that might be partially responsible for this effect is regret. That is, when confronted with information that challenges their preliminary impression decision, the mildly depressed may feel greater regret than the non–depressed. This heightened regret may motivate the mildly depressed to alter their initial impression decision.

**EXPERIMENT 1**

The first experiment reported in this article explores whether the mildly depressed experience more post–decisional regret than the non–de-
pressed. The paradigm is straightforward. Participants are asked to consider a candidate for a university position and to make a decision to hire (or not to hire) the candidate. Later, a second candidate is described to participants, one who is at least as qualified for the job as the initial candidate. Participants did not expect to encounter this second candidate at the time they made their initial decision. After evaluating this second candidate, participants are asked several questions designed to assess how much they regretted their initial decision. Our expectation is that the mildly depressed will report higher levels of regret than the non–depressed. However, it is unclear whether this heightened level of regret will occur in all circumstances.

In Experiment 1 we explore whether three particular situational circumstances might affect the experience of regret. The first of these is the original decision. Individuals might not feel much regret over the initial decision when the initial candidate was rejected — in fact, the presentation of a second candidate who is at least as attractive as the first might even serve to eliminate any residual negative feelings that might linger after the rejection of the initial job candidate. In comparison, if the original decision was to hire the initial candidate, when presented with an unexpected but attractive alternative people might be especially likely to feel that a mistake was made in the original decision. Thus, the mental comparison of the attributes of the first and second candidates might produce high regret. Of particular interest is whether this effect is disproportionately large in those who are mildly depressed.

A second circumstance that might affect the experience of post–decisional regret is the relative quality of the first and second candidates. This idea is consistent with ideas derived from both cognitive dissonance theory (Festinger, 1957) and decision affect theory (Mellers, Schwarz, Ho, & Ritov, 1997). We manipulated this in Experiment 1 by presenting different descriptions of the first candidate to different groups. Some participants were exposed to an initial candidate that was perceived to be relatively low in quality, while other participants were exposed to an initial candidate that was perceived to be relatively high in quality. Hence, the second candidate that was presented to participants in all groups was much better than the first candidate presented to the low quality group, and was not significantly different (maybe a little better) than the first candidate presented to the high quality group. One might suspect that regret at the initial decision should be especially high when a participant made an initial decision to hire a low quality candidate, and that the regret level should be lower when the initial candidate was relatively high in quality. We were also interested in whether the magnitude of such an effect would depend on the depressive status of the participant.
A third circumstance that might affect the experience of regret is the personal relevance of the decision, a factor that may be related to the tendency to engage in counterfactual thought (see Myers–Levy & Maheswaran, 1992; Roese & Olson, 1995). Accordingly, participants in the high relevance condition were told that the candidate was going to be hired for a position at their own university. Participants in the low relevance condition were told that the candidate was to be hired for a position at another university. A decision to hire a low quality candidate might be especially likely to prompt regret when the decision had high personal relevance. We were also interested in whether such an effect would interact with the depressive status of participants.

One final issue addressed in Experiment 1 is whether any differences in regret between the mildly depressed and the non–depressed are uniquely due to depression, or whether they are attributable to other personality factors that are related to depression, such as locus of control or causal uncertainty. Rotter (1966) defined locus of control as a continuum reflecting the extent to which people perceive life events being controlled by their own behaviors (internal locus of control) or by external sources (external locus of control). Prior research related to locus of control has demonstrated a significant relationship between depression and perceptions of personal control (Beck, 1972; Burger, 1984; Markman & Weary, 1996; Rehm & O’Hara, 1979; Weary & Gannon, 1996; Wheeler & Davis, 1979).

Causal uncertainty has likewise been shown to be related to depression (Weary & Edwards, 1994). Causal uncertainty refers to an individual’s ability to distinguish and understand cause–and–effect relationships in one’s social world. Weary and her colleagues propose that feelings of uncertainty and uncertainty reduction play a major role in influencing one’s social cognitive processes. Moreover, they have suggested that causal uncertainty beliefs may intensify depressive symptoms. Indeed, there has been a strong and consistent empirical relationship reported between levels of depression and uncertainty regarding the causes of accomplishments and social events (e.g., Gleicher & Weary, 1991; Marsh & Weary, 1989; Weisz, Sweeney, Proffitt, & Carr, 1993; Weisz, Weiss, Wasserman, & Rintoul, 1987).

We used causal structure modeling to explore how locus of control, causal uncertainty and depression might jointly be related to regret. There are several theoretically interesting causal structures that may emerge, but regardless of the structure, we expect the construct of depression to be significantly linked to regret. This outcome would be consistent with prior research suggesting that the depressed are more likely to report feelings of regret than non–depressives (Lecci et al., 1994). Furthermore, such an outcome is consistent with theoretical
speculations that depression is a unique construct that is related to, but is different from, locus of control and causal uncertainty (Weary & Edwards, 1994).

Although we expect a significant path between depression and regret, it is possible that such a path may not emerge from the analyses. This may occur if the correlation between depression and regret is actually caused by either causal uncertainty or locus of control, both of which are likely to be significantly correlated with depression. Such an outcome would not be unreasonable, and might be reflected in the presence of other direct paths in the causal models. For example, a direct path between causal uncertainty and regret may occur if people who are high in causal uncertainty are unclear about the attributes that constitute a good job candidate. The inability to clearly articulate these attributes may cause those who are high in causal uncertainty to be particularly likely to compare the attributes of the initial candidate to the second candidate. As Kahneman and Tversky (1982) have argued, such comparisons can lead to regret. Similarly, those who are feeling control deprived might also be especially motivated to examine and compare the features of the candidates, and hence, to experience heightened regret. However, a significant path between locus of control and regret would not be consistent with the results of the Markman and Weary (1996) counterfactual reasoning experiment. The results of that experiment indicated that generation of upward counterfactuals in depressives was driven by perceptions of control loss only when events were repeatable (e.g., the situations were expected to happen again in the future). Given that our judgment scenario does not involve such repeatability, the Markman and Weary result leads us to expect that, at best, locus of control should only indirectly contribute to regret.

METHOD

Participants. In partial fulfillment of a course requirement, 268 introductory psychology students (175 females and 93 males) from a large Midwestern university participated in the study. Participants were run in groups of one to four.

Procedure. On arrival, participants were met by the experimenter and instructed to take a seat at a table. When all participants had arrived, the experimenter gave them the following instruction: “You are to imagine that you have been appointed to an intra–university committee whose task is to evaluate a candidate for a faculty position. We would like you to read the vita of a hypothetical individual, Michael G. Richards. Attached to the vita is a biographical sketch concerning his interest in this position. Carefully read this vita and biographical sketch.”
Participants were randomly assigned to one of two decision relevance conditions. The instructions given in the high relevance condition led participants to believe that the candidate was applying for a position at the participants’ university. Instructions given to participants in the low relevance condition led them to believe that the job candidate was applying for a job at another university in the Midwest. This manipulation is modeled on manipulations successfully used to investigate cognitive processes in attitude change (see Petty & Cacioppo, 1986).

The candidate’s vita included information about such things as his GPA, GRE scores, graduate university attended, publications, awards, and memberships in professional organizations. A personal statement was also attached to the vita. Different groups of participants were given different personal statements. In the high quality condition, the job candidate’s personal statement indicated that he had several attractive job offers from other universities. In the low quality condition, the candidate’s personal statement indicated that he had not received any other job offers and that this was the last job that was available for him.

A separate pretest was used to verify that these descriptions differed in terms of perceived candidate quality. In this pretest, each of three groups of participants evaluated one of the three candidate descriptions that were used in the study. Each candidate was rated in terms of how qualified the candidate was, how good a professor they would be, how attractive they were, and how strong a candidate they were. An index was formed by averaging these four ratings (Cronbach’s $\alpha = .77$). Comparison of the data provided by the groups given one of the two initial descriptions indicated that the high quality first candidate ($M = 2.79$) was perceived to be significantly more positive than the low quality first candidate ($M = 2.57$), $t(136) = 1.92, p < .05$ (one tailed), $MSE = .37$.

After reading the vita and the personal statement of the applicant, participants were instructed to write a short paragraph indicating their arguments in favor of hiring the candidate. After this was completed, participants were instructed to list their arguments against hiring the candidate. Following this task, participants were asked: (a) if they would hire Mr. Richards (yes or no), and (b) to indicate their degree of confidence in their decision. This confidence rating was made on a 7-point scale anchored by Not at All Confident at the low end and Extremely Confident at the high end.

1. An identical manipulation was used by Wheeler and Davis (1979). However, Wheeler and Davis assumed that they were manipulating decision seriousness rather than candidate quality. Our pretest results provide assurance that this manipulation does affect perceptions of candidate quality, and the data are most consistent with this interpretation.
Participants were then asked to complete the Beck Depression Inventory (BDI), followed by the Causal Uncertainty Scale (CUS). Participants’ responses to these instruments were later scored according to the established procedures described elsewhere (e.g., Beck & Steer, 1987). The BDI results produced data that are comparable with data obtained from prior studies ($M = 7.76$, $sd = 6.33$). Participants were classified as mildly depressed if they had scores of 10 or above on the BDI ($M = 14.66$); otherwise they were classified as non–depressed ($M = 4.83$). We note that the label “mildly depressed” is most appropriate for our depressed participants: None of our participants had BDI scores above 25 and 95% of the depressed participants’ scores were between 10 and 18. Because this study used only one administration of the BDI, it is unclear if our participants’ depressive state was temporary or relatively chronic. However, our own experience with this instrument (Skowronski et al., 2002) suggests that over 70% of participants who are initially classified as depressed retain that classification when the BDI is administered three to seven weeks later. Nonetheless, the fact that we used only a single administration of the Beck can be perceived as a limitation on the generalizability of the results of this study.

Next, participants were unexpectedly given a Curriculum Vita describing the qualifications of a second candidate for the job, Steven T. Johnson. The pretest study indicated that this second candidate was perceived to be significantly better ($M = 2.96$) than the low quality version ($M = 2.57$) of the first candidate, $t (138) = 2.16$, $p < .05$ (one–tailed), but was not perceived to be significantly better than the high quality version of the first candidate ($M = 2.79$), $t (138) = 1.45$, $p > .05$ (one–tailed), $MSE$ for both tests = .37. Hence, for the low quality group, this second candidate was a substantially better job prospect than the first; for the high quality group, this second candidate was, at best, only a marginally better candidate.

After viewing the qualifications of this second candidate, participants were asked four questions. These questions were designed to measure participants’ regret about the initial decision that was made. The first item asked participants to indicate how much they regretted their initial decision; the second item asked about the degree of discomfort they felt about their initial decision; the third item assessed the extent of their desire to revisit their initial decision; and the fourth item assessed the extent of their desire for additional information about the first candidate. The response scales used for all items ranged from 0 to 6, with the low end of the scale anchored by labels indicating little desire, discomfort, or regret, and the high end of the scale anchored by labels indicating extreme desire, discomfort, or regret. After completing the regret scales, participants completed the Locus of Control Scale (Rotter, 1966), which
was later scored according to established procedures. Finally, participants were debriefed and dismissed.

RESULTS

**Depression Is Associated with Heightened Regret.** The correlations among responses to the four questions related to regret were all significant, so we combined these four questions into a regret index (Cronbach’s \( \alpha = .81 \)). This index was then used as the dependent variable in a Depression (non–depressed, depressed) × Personal Relevance (low, high) × Initial Candidate Quality (low, high) × Initial Hiring Decision (yes, no) between–subjects ANOVA. The MSE for all effects in the ANOVA was 1.44.

We expected that those who were mildly depressed would report more post–decisional regret than those who were not depressed. This expectation was confirmed (depressed \( M = 2.50 \), non–depressed \( M = 2.09 \)), \( F(1, 252) = 4.49, p < .04. \) We were also interested in whether this enhancement of regret in the mildly depressed would depend on the personal relevance of the decision, initial candidate quality, or the initial hiring decision. The analysis yielded no significant interactions involving depression and any of these three variables, largest \( F(1, 252) = 1.23, p < .27. \) The only other significant effect in this analysis was for the initial hiring decision, \( F(1, 252) = 65.85, p < .0001. \) As expected, the means for this effect indicate that regret was substantially higher when a decision had been made to hire the first candidate (\( M = 2.70 \)) than when a decision had been made not to hire (\( M = 1.25 \)).

**Depression Is Unrelated to the Initial Hiring Decision.** Given that the hiring decision was powerfully related to post–decisional regret, it is reasonable to speculate about whether depression could have been related to regret because of a relation between depression and the initial hiring decision. This hypothesis is inconsistent with the results of the ANOVA, which evaluates each effect in the analysis independently of the other effects that are entered; hence, the effect that was observed for

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2 We also conducted an additional set of analyses in which the depression variable was treated as a continuous predictor of regret. In these analyses we explored the linear and quadratic relations between depression and regret. There were no quadratic relations, but that could be a function of the relatively narrow range BDI scores in the sample: an overwhelming majority of participants were scored in the mildly depressed range. Conclusions from the linear tests basically duplicated those derived from the traditional scoring of the BDI. Given that the BDI is traditionally scored as a dichotomous test, and considering the relative ease of data presentation accompanying dichotomization, we report analyses that involve the dichotomized variable.
the depression variable ought to have been independent of the effect for the initial decision variable. Nonetheless, we sought to pursue this possibility further by using the hiring decision as a dependent measure in a Depression × Personal Relevance × Initial Candidate Quality between–subjects ANOVA. The MSE for all effects in the ANOVA was .23. There were no significant main effects or interactions involving the depression variable that resulted from this analysis (largest $F(1,260) = 1.63$, $p > .21$). Both the mildly depressed and the non–depressed made the decision to hire the initial candidate with about equal frequency (depressed $M = .68$, non–depressed $M = .65$). This result dispels the possibility that the heightened regret reported by the mildly depressed was caused by the fact that their hiring decisions differed from the hiring decisions of the non–depressed.

There were no other results of the analysis that were statistically reliable. The absence of any significant effects suggests that the manipulations of personal relevance and candidate quality were relatively weak. However, although not statistically reliable, $F(1,260) = 1.59$, $p > .21$, the means for the Personal Relevance × Initial Candidate Quality Interaction suggest that these manipulations may not have been entirely ineffective. When the decision was of low personal relevance, the quality of the initial candidate was unrelated to the hiring decision (high quality $M = .64$, low quality $M = .63$). However, when the decision was personally relevant, candidate quality did matter to the hiring decision (high quality $M = .75$, low quality $M = .63$). Although non–significant, this pattern mirrors the pattern obtained when these variables are used in studies of attitude change (see Petty & Cacioppo, 1986).

Depression Is Not Strongly Related to Confidence in The Initial Hiring Decision. One other way to assess the potential effectiveness of the personal relevance and initial candidate quality manipulations is to examine whether they were related to confidence in the initial hiring decision. In addition, such an analysis would provide an opportunity to examine whether depression was related to decision confidence. Toward these ends, participants’ confidence ratings were used as the dependent measure in a Depression × Personal Relevance × Initial Candidate Quality × Hiring Decision between–subjects ANOVA. The MSE for all effects in this analysis was 1.06.

Although there were no significant results involving the depression variable, the results hint at the possibility that depression might be weakly related to confidence in the initial hiring decision. The depressed ($M = 4.13$) reported slightly less confidence in their initial hiring decision than the non–depressed ($M = 4.30$), $F(1, 252) = 2.34$, $p > .13$.

The results of the analysis also provide evidence that the manipulation of candidate quality was effective: participants in the high quality condi-
tion expressed more confidence in their initial decision \((M = 4.38)\) than participants in the low quality condition \((M = 4.13)\), \(F(1, 252) = 4.83, p < .03\). This result suggests that the absence of any interactions between depression and the candidate quality variable on the regret measure cannot be attributed to ineffectiveness of the candidate quality manipulation.

**Depression Is Uniquely Linked to Regret.** Another of our primary interests in Experiment 1 was to use causal modeling to examine the interrelations among post-decisional regret, locus of control, causal uncertainty, and depression. Several theoretically interesting linkage patterns are reasonable. One possibility is that there may be no direct path between depression and regret. Instead, the apparent relation between depression and regret that we reported earlier in this results section may have been caused instead by either causal uncertainty or locus of control, which are both significantly correlated with depression \((r's = .43 & .40, both p's < .0001)\). If this were the case, then one (or both) of these variables would have direct paths to regret, and the path between depression and regret would be non-significant. A second possibility is that there is a significant path from depression to regret, despite the presence of other significant paths in the model. This outcome would suggest that the relation between depression and regret is not driven by locus of control or by causal uncertainty.

To examine these possibilities, we used EQS to estimate a structural equation model (Bentler 1995; Bentler, & Wu, 1995). Because depression was treated as a dichotomous variable, we used the AGLS option in EQS to generate a polyserial correlation matrix for our analyses. Following Hayduk’s (1987) advice, we randomly divided our sample in half, derived a model using the first half-sample, and then confirmed the model by testing it on the second half-sample. On the first random half-sample, we retained only paths that were significant at \(p < .10\). This procedure resulted in a good-fitting model \((AGLS \chi^2 (4) = 2.835, p = .586)\) that included correlations among the three independent variables, as well as causal paths from depression to regret, from causal uncertainty to the hiring decision, and from the hiring decision to regret. The model also fit the data well on the second half-sample \((AGLS \chi^2 (4) = 6.847, p = .144)\), and the path structure that was output by the second half-sample was highly similar to the path structure output for the first half-sample.

Given the high degree of similarity in the results using the two half-samples, we decided to apply the estimated model to the full sample. The results of this analysis indicate that the model is a good fit to the data \((Yuan–Bentler corrected AGLS \chi^2 (4) = .847, p = .932, root mean squared residual = .008, comparative fit index = 1.000, corrected comparative fit index = 1.000)\). Inspection of the Lagrange multipliers indi-
cates that we cannot improve the model by adding or dropping any of the parameters. Figure 1 depicts the paths that were significant in the model. These results indicate that only depression and the initial hiring decision directly contribute to post–decisional regret. Causal uncertainty contributes to regret, but only indirectly, through the initial hiring decision. Locus of control does not contribute to either the hiring decision or to regret. For comparative purposes, the total effects of each of the significant predictors of regret are presented in Table 1.

SUMMARY AND DISCUSSION

In Experiment 1 people were asked to make a decision about a job candidate. After this decision was made, the credentials of a second candidate were unexpectedly produced. After seeing the credentials of this second candidate, individuals reported how much they regretted their initial hiring decision. Those who chose to hire the initial candidate and then saw the surprise second candidate reported more regret than those who did not choose to hire the initial candidate. Those who were mildly depressed reported more regret over their initial decision than those who
were non–depressed. The results of causal modeling analyses suggested that the relation between depression and regret was not a function of other closely related constructs such as locus of control or causal uncertainty. Moreover, a heightened regret level in depressives was observed regardless of the personal relevance of the decision, the quality of the initial candidate, or the initial hiring decision.

For at least two of these variables, the results of our study suggest that the absence of interactions with the depression variable probably cannot be attributed to weak operationalizations of the variables. Certainly, the data indicated that the initial hiring decision was strongly related to regret, with greater regret occurring when participants decided to hire the initial candidate. Furthermore, in addition to the pretest results indicating significant quality differences among the three candidate descriptions used in the study, initial candidate quality was significantly related to participants’ confidence in their original decision. There was even some marginal evidence suggesting that the third manipulation that we used, personal relevance, was not entirely impotent. Although non–significant, initial candidate quality tended to affect the initial hiring decision only when the decision was of high personal relevance, a pattern that has emerged in past attitude change research using a similar manipulation (e.g., Petty & Cacioppo, 1986). Nonetheless, the evidence also suggests that the candidate quality and personal relevance manipulations were not terribly powerful in Experiment 1, rendering the absence of interactions between the depression variable and these manipulations theoretically ambiguous. This state of affairs argued for a replication of the experiment with stronger candidate quality and personal relevance manipulations. We undertook these tasks in Experiment 2.

One of the other goals of Experiment 2 was to assess whether the differences in regret levels that we observed between the mildly depressed and the non–depressed is a general post–decisional phenomenon or is limited to circumstances in which a decision is unexpectedly challenged

### TABLE 1. Significant Direct, Indirect and Total Effects in the Path Analysis on Participants’ Regret Over Their Initial Hiring Decision

<table>
<thead>
<tr>
<th></th>
<th>Direct Effect</th>
<th>Indirect Effect</th>
<th>Total Effect</th>
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<tbody>
<tr>
<td>Depression</td>
<td>.162</td>
<td>—</td>
<td>.162</td>
</tr>
<tr>
<td>Causal Uncertainty</td>
<td>—</td>
<td>.063</td>
<td>.063</td>
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<tr>
<td>Initial Hiring Decision</td>
<td>.613</td>
<td>—</td>
<td>.613</td>
</tr>
</tbody>
</table>

*Note. All coefficients are standardized, all p’s < .001.*

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by an unexpected new option. To explore this question, in Experiment 2 we modified the paradigm used in Experiment 1 in two ways. First, in Experiment 2 we held the quality of the first candidate constant and manipulated the quality of the second candidate (we did the opposite in Experiment 1). Second, in Experiment 2 we measured people’s feelings of post–decisional regret at two points in time. The first was immediately after the hiring decision was made; the second was after the qualifications of the unexpected second candidate were presented. The assessment of regret at two points in time allowed us to observe whether differences in post–decisional regret levels of the mildly depressed and the non–depressed emerged either prior to, or after, the presentation of the second candidate’s credentials. It also allowed us to assess whether the magnitude of the regret differences that were present after the initial decision were altered by the quality of the second candidate manipulation.

EXPERIMENT 2

METHOD

Participants. In partial fulfillment of a course requirement 431 introductory psychology students (259 females and 172 males) from two large Midwestern universities participated in the study. Participants were run in groups of one to six.

Procedure. The general instructions and procedure that were used in Experiment 1 were used again for Experiment 2. This section both provides an overview of Experiment 2 and highlights the changes from Experiment 1’s procedure.

The relevance manipulation in Experiment 2 resembled that used in Experiment 1. Some participants were told that they would read the application of a job candidate applying for an academic job at the participants’ university (high personal relevance); others read the application of an applicant applying for a job at another university (low personal relevance). However, in an attempt to increase the impact of the high personal relevance manipulation, participants in the high relevance condition were also told to imagine that they would likely have to take a course from the person who was hired soon after that person arrived on campus.

The initial application that participants viewed consisted of a letter of recommendation from the candidate’s former professor at the University of Minnesota and an academic Vita. Pretest responses indicated that this candidate’s job qualifications were perceived to be slightly above average. Only the recommendation letter and Vita were used to convey
the candidate's competence level: the personal statement that was used in Experiment 1 was dropped.

Participants were given five minutes to read the information. They then wrote two short paragraphs, first detailing aspects of the candidate that made him appealing and then detailing aspects that made him unappealing. Four minutes were provided to write each paragraph. Following the writing task, participants were asked to decide whether to hire the candidate and to rate how confident they were about their hiring decision. The confidence rating was made on a 0 to 6 scale anchored by the labels Not at all confident and Very confident.

Next, participants responded to a series of eight questions assessing the participant’s level of regret about their hiring decision. Some of these items recapitulated those used in Experiment 1; others were new items taken from research on the psychology of regret that emerged after Experiment 1 had been completed (Zeelenberg, van Dijk, & Manstead, 1998). These questions included: how much regret participants were feeling; if they experienced a sinking feeling when they thought about their decision; whether they would be interested in seeing more information about the candidate; how much they would want to revisit their hiring decision given the opportunity to do so; how much they wished they had made a different decision; how much they might think about kicking themselves when they thought about their decision; the extent to which they wanted to undo their hiring decision; and the extent to which they thought their initial decision might have been a lost opportunity. Responses to these items were made on a 0 (Not at all) to 6 (Very Much) scale.

After completing their responses to the first candidate, participants were asked to imagine that another candidate had applied for the position but because of a postal service mistake the application arrived late and they were unable to see it until after they had already made their decision about the first candidate. This second application also consisted of a letter of recommendation from a former professor and an academic Vita.

Participants received one of three versions of this second application. The high–quality applicant’s letter was written by a fictitious Harvard professor; the moderate–quality applicant’s letter apparently came from a fictitious Penn State professor, and the low–quality candidate’s letter apparently came from a fictitious Cleveland State professor. In addition, pretesting indicated that the content of the vita and letter reflected candidate quality such that the high quality person was perceived to be clearly superior to the candidate about whom participants had already made a hiring decision, the medium–quality candidate was similar in
quality to that already-decided candidate, and the low-quality candidate was lower in quality than the already-decided candidate.

Participants again were given five minutes to read through the second candidate’s vita and recommendation letter. Afterward, they were asked to spend 4 minutes listing appealing features of the candidate and another 4 minutes listing the candidate’s unappealing features. After this task participants were again asked to indicate the amount of regret that they felt about their decision to hire (or not hire) the first candidate. The same eight questions that were used previously were again used to assess participants’ regret level.

Finally, after completing a series of personality scales that included the Beck Depression Inventory, all participants were thanked and debriefed. The data obtained from the BDI resembled those obtained in Experiment 1 ($M = 7.72, sd = 6.51$), as did the means for the mildly depressed ($M = 15.31$) and non-depressed ($M = 4.06$) groups. As in Experiment 1, the level of depression in the mildly depressed group was truly mild; although there were 4 people who were assigned Beck scores of 30 or more (with a high score of 38), only 7% of the participants earned a score that was above Beck’s cutoff for mildly depressed individuals (a score of above 18).

RESULTS

The correlations among responses to the eight questions related to regret all were significant for both the first set of regret items and the second set of regret items. Hence, we constructed two regret indices, one from the first set of regret responses (Cronbach’s $\alpha = .84$) and one from the second set of regret responses (Cronbach’s $\alpha = .95$). These indices were entered into a Depression (non-depressed, depressed) $\times$ Personal Relevance (low, high) $\times$ Second Candidate Quality (low, high) $\times$ Initial Candidate Decision (yes, no) $\times$ Regret Measure Timing (after first candidate, after second candidate) mixed ANOVA with repeated measures on the last variable.

However, in interpreting the results of this ANOVA readers should be warned that our changes to the candidate descriptions apparently made the initial candidate too attractive: Over 87% of our participants chose to hire the first candidate. This high “yes” rate caused a severe imbalance in cell frequencies in the ANOVA. Consequently, the three-way interactions (or higher) involving the initial decision variable and any two of the other between-participant variables in the analysis ought to be viewed with caution. Some cell means for these interactions contained fewer than five observations and, hence, are highly unstable.
Depression Is Associated with Heightened Regret. As in Experiment 1, mild depressives reported greater levels of regret ($M = 2.11$) than non–depressives ($M = 1.78$), $F (1, 407) = 4.81, p < .03, \text{MSE} = 1.63$. Of particular interest in Experiment 2 was whether this level of regret depended on the time at which regret was measured. It did not: the Depression $\times$ Regret Measure Timing interaction was not significant, $F (1, 407) = 1.08, p > .30, \text{MSE} = .87$. The implication, then, is that mild depressives experience more post–decisional regret than non–depressives, regardless of whether or not the decision is challenged by the presentation of new options. In fact, the difference in feelings of regret between the mildly depressed and the non–depressed were stable across all the conditions used in Experiment 2: there were no interactions between the depression variable and any of the other variables examined in the experiment.

One concern in Experiment 1 was whether the absence of effects in that experiment was a consequence of weak manipulations. Consequently, an attempt was made in Experiment 2 to strengthen the candidate quality and personal relevance manipulations. As reflected in the Regret Measure Timing $\times$ Initial Candidate Decision $\times$ Second Candidate Quality interaction, $F (2, 407) = 45.51, p < .0001, \text{MSE} = .87$, this attempt was successful for the candidate quality manipulation. The means for this interaction, presented in Table 2, show that after participants agreed to hire the initial candidate they were especially regretful about their choice when the second candidate was high in quality but expressed little regret when the second candidate was low in quality. In comparison, after participants rejected the initial candidate they were especially re-

<table>
<thead>
<tr>
<th>Regret Measure Timing</th>
<th>After First Candidate</th>
<th>After Second Candidate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Initial “Yes” Decision</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Quality Second Candidate</td>
<td>1.34</td>
<td>3.62</td>
</tr>
<tr>
<td>Moderate Quality Second Candidate</td>
<td>1.51</td>
<td>2.22</td>
</tr>
<tr>
<td>Low Quality Second Candidate</td>
<td>1.42</td>
<td>.76</td>
</tr>
<tr>
<td><strong>Initial “No” Decision</strong></td>
<td></td>
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</tr>
<tr>
<td>High Quality Second Candidate</td>
<td>2.03</td>
<td>0.47</td>
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<tr>
<td>Moderate Quality Second Candidate</td>
<td>1.76</td>
<td>1.12</td>
</tr>
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<td>Low Quality Second Candidate</td>
<td>2.09</td>
<td>3.38</td>
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gretful when the second candidate was low in quality and expressed lit-
tle regret when the second candidate was high in quality. The implica-
tions of two other interactions reflected in the means of Table 2 (Regret
Measure Timing × Initial Candidate Decision, $F(1, 407) = 20.24, p < .0001,$
$MSE = .87, Initial Candidate Decision × Second Candidate Quality, $F(2,$
$407) = 29.95, p < .0001, MSE = 1.63$) are obviously qualified by the
significant three–way interaction.

In contrast to our success at demonstrating the relation between candi-
date quality and regret, our attempts to show a relation between per-
sonal involvement and regret came to naught. There were no significant
effects or interactions involving the personal involvement variable. In
fact, there were no significant effects in the analysis other than those
already reported.

**Depression Is Unrelated to the Initial Hiring Decision.** Given that the
hiring decision was powerfully related to post–decisional regret (al-
though qualified by the quality of the second candidate), it is reasonable
to speculate about whether depression could have been related to regret
because of a relation between depression and the initial hiring decision.
This hypothesis is inconsistent with the results of the ANOVA, which
evaluates each effect in the analysis independently of the other effects
that are entered; hence, the effect that was observed for depression vari-
able ought to have been independent of the effect for the initial decision
variable. Nonetheless, we sought to pursue this possibility further by us-
ing the hiring decision as a dependent measure in a Depression ×
Personal Relevance between–subjects ANOVA.

No significant effects emerged from the ANOVA, although the per-
sonal relevance effect did approach significance, $F(1, 427) = 3.44, p < .07,$
$MSE = .11.$ Examination of the means for this effect indicates that people
were a bit less likely to choose the first candidate if the candidate were to
be hired on the participants’ own campus ($M = .84$) than if they were to
be hired as a faculty member on a different campus ($M = .90$).

**Depression Is Not Strongly Related to Confidence in the Initial Hiring Deci-
sion.** One other way to assess the potential effectiveness of the personal
relevance manipulation is to examine whether it was related to confi-
dence in the initial hiring decision. In addition, such an analysis pro-
vides an opportunity to examine whether depression was related to de-
cision confidence. Toward these ends, participants’ confidence ratings
were used as the dependent measure in a Depression × Personal Rele-
vance × Initial Hiring Decision between–subjects ANOVA.

The only significant effect in the analysis was for the initial decision, $F$
$(1, 423) = 69.38, p < .0001, MSE = .81.$ Participants who agreed to hire
the initial candidate did so more confidently ($M = 4.42$) than those who did
not ($M = 3.24$).
SUMMARY AND DISCUSSION

In Experiment 2 people made a decision about a job candidate and their level of regret over the decision was assessed. After this decision was made, the credentials of a second candidate were unexpectedly produced. After seeing these credentials, people again reported how much they regretted their initial hiring decision. Those who were mildly depressed reported more regret over their initial decision than those who were non-depressed. This heightened regret level in depressives was observed regardless of the personal relevance of the decision, the quality of the second candidate, the initial hiring decision that was made, or the time at which regret was measured. However, the results of Experiment 2 suggest that the absence of interactions between these variables and the depression variable cannot be attributed to weak operationalizations of three of these variables. In Experiment 2 the initial hiring decision, the quality of the second candidate and the timing of the regret measure all had an impact on post-decisional regret. After participants agreed to hire the initial candidate they were especially regretful about their choice when the second candidate was high in quality and expressed little regret when the second candidate was low in quality. In comparison, after participants rejected the initial candidate they were especially regretful when the second candidate was low in quality and expressed little regret when the second candidate was high in quality.

There was only weak evidence suggesting that the fourth of these variables, personal relevance, had an impact on participants. Given the power of this manipulation in the attitude change literature (e.g., Petty & Cacioppo, 1986) the relative impotence of this manipulation is surprising. However, it may be the case that our relevance manipulation failed to affect regret because of the nature of our study. Participants may not have been involved enough in our experiment for the personal relevance manipulation to matter. In this regard, it is interesting to note that the methodology that we used (attempting to directly arouse and measure regret in our participants) differs from the methods often used by other researchers in this area. Rather than directly arousing regret, these other researchers (e.g., Kahneman & Tversky, 1982) often ask people to predict how much regret they would feel if they were in a given situation (for a similar point, see Zeelenberg et al., 2000, p. 531). Although these studies lack the emotional component that accompanies directly experienced regret, for purposes of exploring the activation of regret such a predictive methodology may be superior to the one that we employed. The use of such predictive (or anticipated regret) scenarios allows people to assume that the decision really matters to them; the relatively low regret
levels that our participants reported suggests that their decision did not matter much to them, even in the high relevance condition.

Furthermore, despite the absence of such effects in our study, regret might still be related to personal relevance. For example, consider a situation in which students were selecting their own teacher and discovered a surprise second teacher who was far superior to the first. In these circumstances regret differences between the mildly depressed and the non-depressed might emerge only some time after the initial decision had been made. That is, the non-depressed might experience regret but quickly “get over it.” In comparison, the mildly depressed might continue to experience regret over their initial decision well after the decision had been made—they may have trouble “getting over it.” This effect may only occur when the decision is important—if the depressives were selecting an instructor for others, regret perseverance may not occur. Hence, we believe that there still may be a role for personal relevance to play in understanding the regret experienced by the mildly depressed.

GENERAL DISCUSSION

People make decisions about themselves and their social world every day and sometimes regret those decisions. Our results document variables that are associated with such regret. For example, when a choice to pursue a course of action is made and an unexpected and attractive new option emerges, people feel regret over their initial choice. Moreover, our results also document individual differences in the experience of regret. Those who are mildly depressed experience greater regret over their decisions than the non-depressed. Our results further suggest that this relation between mild depression and regret is not attributable to the effects of other constructs closely related to depression, such as locus of control or causal uncertainty.

Our predictions about relations between the variables of interest in our study and regret were derived from theories linking these variables to counterfactual thought (e.g., Markman & Weary, 1996), and from research linking counterfactual thought to regret (e.g., Kahneman & Tversky, 1982). Others have proposed similar linkages. For example, Roese and Hur (1997) suggest that the experience of regret might participate in a bi-directional causal feedback loop with counterfactual thought. For example, the tendency of the depressed to engage in counterfactual thought might contribute to heightened feelings of regret. The negative affect associated with regret might itself be an additional spur to the production of even more counterfactual thought. Although this idea is attractive, it remains to future research to strengthen
the linkages among the constructs that are potential causes and consequences of regret.

Because we have not fully documented the mediating mechanisms, it is possible that some of our regret results were caused by another variable. For example, the negative affect of those who are mildly depressed might cause them to respond more negatively to the world around them than those who are not depressed, independently of any regret–related counterfactual thinking that might occur. However, we note that the counterfactual mechanism can account for all of the regret effects that emerged in this article, regardless of whether those effects reflected individual difference variables or situational variables. Occam’s razor suggests that the simplest explanation that accounts for the most effects ought to be preferred to more complex explanations that involve multiple mechanisms. Moreover, we note that independent evidence for the mediational link already exists: Mildly depressed individuals are more likely to generate upward counterfactuals for events than those who are not depressed, especially when the events are potentially controllable and may happen again (Markman & Weary, 1996).

One other possible factor that might have influenced the results of the present research is that the Beck Depression Inventory was administered in the same session as, but prior to, the measurement of regret. It is possible that the BDI could have primed negative affect in the depressed (see Mark, Sinclair, & Wellens, 1991), which could potentially account for the difference in regret reported by the depressed and the non–depressed. Such priming could also explain why regret was unrelated to any of the situational manipulations that we used. However, in Experiment 1 the causal uncertainty scale was also administered prior to completion of the regret scales. If priming was responsible for the depression–regret link, it also seems reasonable to expect that a significant path between causal uncertainty and regret should have emerged in our analyses. The absence of a significant direct path between these two constructs suggests that the priming explanation for the relation between depression and regret is not tenable.

One other worry about order effects is that the lack of effects involving the Locus of Control scale in Study 1 might have been caused by the fact that the Locus of Control scale was administered after the BDI. The “obvious” fix to this concern is an experiment that manipulates questionnaire order. However, although apparently obvious, such a manipulation may have its own problems. Norbert Schwarz’s work on conversational norms in question answering suggests that answering the two sets of items in close proximity to each other might cause an artificial distinction to be made between those two sets of items. That is, it might be the case that the BDI and CUS items usually tap the same con-
struct, but by asking subjects to respond to both sets of questions in temporal proximity one is implicitly demanding that the answers to the second scale presented be different from answers to the first. The upshot is that the best empirical answer to this point would involve at least two studies, one in which the scales are presented in temporal proximity with order varied and one in which the scales are presented with a temporal lag (again, with order varied). Such studies can be the target of future research.

An additional concern in the present research is that we offered only one administration of the Beck Depression Inventory. Given this single administration, it is likely that some of the participants that were classified as depressed may have simply been experiencing a temporary negative mood state. This negative mood state may have caused these individuals to answer the BDI in such a way that they were misclassified as mildly depressed.

We are sensitive to this concern. However, there are a number of reasons to be reasonably confident about our results. First, the variables of locus of control and causal uncertainty measured in Experiment 1 provide a check on the depression classifications. One would expect that those who are classified as depressed should have higher causal uncertainty and should perceive less control than those classified as non–depressed. If we had a significant number of depression misclassifications, these relations should be weak, or should not appear at all. To check these relations, we conducted two one–way ANOVAs using causal uncertainty and locus of control scores as dependent measures. In both analyses, the depression classification variable was the predictor. The depression classification was significantly predictive of both dependent measures (causal uncertainty: $F(1, 266) = 54.03, p < .0001$; locus of control: $F(1, 266) = 37.02, p < .0001$, suggesting that the depression classifications were reasonably accurate.

A second point to consider is that, if anything, the misclassifications that did occur should have worked against our hypothesis. That is, assuming that there really is a difference in the amount of post–decisional regret experienced by the mildly depressed and the non–depressed, one’s chance of observing this relation is reduced if one cannot correctly label participants as mildly depressed or non–depressed. Obviously, the fact that we did find this relation, even in the face of potential misclassifications, suggests that a depression–regret relation does exist.

A third point is that other research (e.g., Roese & Hur, 1997) suggests that negative affect may play a central role in the heightened production of counterfactual thinking and regret. Given this potentially central role, whether a person is experiencing a short–term mood fluctuation or has long–term mild depression may be irrelevant. The negative affect asso-
associated with either may be sufficient to instigate the counterfactual processing that may produce regret.

Nonetheless, we agree with the idea that one should be cautious in generalizing our results beyond the conditions that we established in this initial investigation of the relation between mild depression and regret. As in any initial set of studies, variations in experimental methodology should be employed to establish the generality of the regret effects observed in the present research. However, by the same token, it is useful to recall that there were good reasons, both in past theory and research, to postulate the existence of such effects.

These regret effects might have particularly important implications for depressives. If this enhanced regret occurs in depressives with regularity, and if it occurs across conditions, it might help to explain the persistence of depression in those who are beset by this condition. Moreover, while it may not be appropriate to consider the mildly depressed as being impaired in this regard, it is certainly the case that a propensity for chronic counterfactual thinking and uncertainty in decision–making may prove to be especially maladaptive to the mildly depressed. This may extend beyond the larger life issues, such as when one makes career choices or is attempting to establish or maintain interpersonal relationships. That is, such post–decisional conflict could deny the mildly depressed the opportunity to feel a sense of confidence or closure, even in the most trivial judgments that they make. This could result in the avoidance of judgment and decision–making, creating a perpetually turbulent lifestyle for these individuals. It remains to future research to explore whether regret can have such far–reaching implications.

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