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The Influence of Emphasizing Psychological Causes of Depression on Public Stigma

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Abstract

Public stigma discourages people with depression from seeking help. Attribution theory predicts that psychological causal explanations for depression increase public stigma by emphasizing personal responsibility for the condition. Schema theory may, however, present a less stigmatizing psychological etiology by emphasizing childhood experiences. Undergraduate participants ($N = 276$) were randomly presented with vignettes positing biomedical, contextual, cognitive distortion, or cognitive schema explanations for depression. Contextual, cognitive distortion, and cognitive schema explanations for depression were associated with less public stigma relative to the control condition. Future anti-stigma programs may incorporate cognitive and contextual models of depression to reduce public stigma.

Keywords: Attribution, Etiology, Major Depression, Mental Illness (Attitudes Toward), Recovery (Disorders), Stigma

The Influence of Emphasizing Psychological Causes of Depression on Public Stigma

Major depressive disorder has a significant impact on public health due to its individual and societal burden, cost and prevalence. Approximately 5% of Canadians experience a depressive disorder in a given year (Esposito et al., 2007). Unfortunately, individuals with depression often do not seek help from mental health services. For instance, roughly 50% of young adults with depression fail to utilize mental health services in Canada (Cheung & Dewa, 2007). Although a number of factors are associated with reduced mental health care utilization (see Collins, Westra, Dozois, Burns, 2004, for review), public stigma has been identified as an important variable (Corrigan, 2005; Corrigan & Wassel, 2008). Public stigma has been defined as the negative beliefs and attitudes that others hold toward people with depression (Corrigan & Wassel, 2008). Public stigma is associated with people with depression avoiding help-seeking in order for them to minimize prejudice and discrimination (Barney, Griffiths, Jorm, & Christensen, 2006; Link & Phelan, 2001).

In 2008, the Mental Health Commission of Canada (MHCC) began a ten-year initiative to reduce stigmatization and discrimination of mental disorders in Canada (Mental Health Commission of Canada, 2008). The MHCC noted that its approach was based on the best empirical evidence available, but also admitted that there was a paucity of research in the area of stigma reduction for mental disorders. The MHCC hopes that reducing stigma will increase help-seeking and decrease discrimination against individuals with mental disorders. The current research supplements the effort of the MHCC by focusing on a factor that is relevant to public education initiatives – casual explanations for depression. Causal explanations for depression potentially contribute to the development of public stigma through the attribution of responsibility for depression that is made by others (Weiner, 1995).

We make attributions about others to order our world, explain the behaviour of others, and protect ourselves from the threat that others and their behaviour may represent. In explaining the behaviour of individuals with depression, the perceived cause is critical in determining whether they are believed to be responsible for their condition which, in turn, influences subsequent emotional and behavioural reactions (Weiner, 1995). Based on attribution theory, one can predict that causes that can be directly related to an individual, are under the individual's control, and present no extenuating circumstances, would normally elicit an assignment of personal responsibility for depression. This would lead to increased negative attitudes towards that individual and thus increased stigma. Conversely, causes that can be directly related to external factors, are not controllable, and represent extenuating circumstances, would normally result in the individual with depression being held less responsible or not responsible at all for the mental disorder. Such attributions would lead to more positive attitudes toward the individual and thus reduced stigmatization (Weiner, 1995; Weiner, Perry, & Magnusson, 1988).

Past programs which have focused on reducing stigma have taken aspects of attribution theory into consideration. In order to reduce blame, these programs have attempted to convince the public that mental disorders are caused by circumstances outside of an individual's control. Therefore, stigma reduction programs (e.g., the program conducted by the National Alliance on Mental Illness) have traditionally emphasized a biomedical explanation for depression. Recent research has, however, cast doubt as to whether this explanation is the most effective means of reducing public stigma. Rusch, Kanter, and Brondino (2009), for example, demonstrated that contextual explanations of depression (i.e., explanations that emphasize the influence of environmental variables, such as stressful circumstances) are more effective than are biomedical explanations for reducing public stigma. The current research expands this empirical literature by

including a cognitive distortion and a cognitive schema explanation for depression and exploring the effect of various causal explanations on public stigma.

Prior Research on Causal Explanations of Depression in the Context of Stigma

Biomedical Explanation. The biomedical explanation posits that depression is an “illness” caused by biological factors that operate outside of an individual’s control. These factors include genetic vulnerability, the sensitivity of the stress-response system (e.g., the hypothalamic–pituitary–adrenal [HPA] axis), the influence of neurotransmitters, and decreased activity in the prefrontal cortex (Levinson, 2009; Thase, 2009). A biomedical explanation of depression may result in less public stigma, because it suggests that people with depression cannot control the cause of the disorder, thereby exonerating them from responsibility. An increased belief in the biomedical model of depression has indeed been associated with decreased public stigma and reduced blame (see Goldstein & Rosselli, 2003); however, Jorm and Oh (2009) have suggested that the evidence for the effectiveness of biomedical explanations remains equivocal (also see Jorm & Griffiths, 2008). A biomedical model also appears to exhibit some negative unintended consequences. For example, people with depression who had been exposed to a biomedical model of depression assumed less responsibility for their own recovery from depression and displayed less self-efficacy for dealing with depression without the help of antidepressants (Fisher & Farina, 1979; Gammell & Stoppard, 1999; Schreiber & Hartrick, 2002).

Individuals with depression do seem to believe that others will stigmatize them less if the cause of their depression can be explained by a biomedical model (Schreiber & Hartrick, 2002). In addition, a reduction in public stigma after being presented with a biomedical model may only occur if the explanation matches an individual’s preexisting beliefs (Rusch et al., 2009). Even if

the target audience accepts a biomedical model they may nonetheless increase coercive behaviours towards people with depression (Mehta & Farina, 1997). This behaviour seems to be motivated by the belief that people with depression cannot control the disorder themselves and should, therefore, follow the prescriptions and guidelines advanced by others. Weiner (1995) has similarly noted that pitying stigmatized individuals enforces the belief that they are not capable of change and leads to divesting them of opportunities to take responsibility for change.

Instilling the belief that a mental disorder has a biomedical basis can also lead people to believe that a person with a mental disorder is less able to control his or her symptoms. This belief can, in turn, foster the perception that an individual with a mental disorder is dangerous and unpredictable (Read & Law, 1999; Walker & Read, 2002). The biomedical explanation may also suggest that the depression is inherent to the individual (e.g., through genetic vulnerability) and that the potential for change without continuous intervention (e.g., by means of antidepressants) is limited. Experimental manipulation of the perceived cause of mental disorders has indeed revealed that the biomedical model creates less hope for long-term recovery than does a psychological model which emphasizes the interaction between life events, beliefs, and coping skills (Farina, Fisher, Getter, & Fischer, 1978; Lam & Salkovskis, 2007; Lam, Salkovskis, & Warwick, 2005).

Contextual Explanation. Research conducted on the influence of a contextual explanation of depression has shown positive results for the reduction of public stigma (Rusch et al., 2009). A contextual explanation posits that depression is mainly caused by environmental influences. These influences are normally outside of the control of the person with depression but, because one's environment can usually be altered, hope for recovery from depression remains. Stigma

reduction programs for depression, using the contextual model, were found to be more effective in reducing public stigma than a program utilizing a biomedical model (Rusch et al., 2009).

Cognitive Explanation. A cognitive explanation is often not considered a viable model for reducing public stigma because it emphasizes the role of distorted thinking in depression. People with depression often show a number of negative distortions (biases against themselves) in interpreting events; for example, minimizing positive accomplishments, magnifying personal failures, and personalizing neutral events and statements (Beck, Rush, Shaw, & Emery, 1979). Research comparing different perceived causes of depression shows that distorted thinking and other cognitive factors are usually believed to be under a person's control and that seeing such factors as a cause of depression is associated with increased stigma and blame (Cook & Wang, 2010; Goldstein & Rosselli, 2003). A similar conclusion can be reached on the basis of attribution theory – perceiving depression as under personal control would lead to the assignment of responsibility and increase blame and stigma. Indeed, believing that a person's depression is under personal control has been shown to result in increased anger towards that person (Weiner, 1995).

Cognitive Schema Explanation. Cognitive models do not, however, necessarily assign responsibility for the cause of distorted thinking to people with depression. In explaining why people start thinking in a distorted fashion, the role of cognitive schemas is often emphasized (Dozois & Beck, 2008). Schemas can be seen as a group of closely linked cognitive thoughts and associations that are triggered by an event. These schemas are believed to originate in childhood at a time when the individual is not cognitively mature enough to challenge the accuracy of his or her own thoughts and the representations made by others (Young, Klosko, & Weishaar, 2003). For example, a person who is faced with failure at work may experience a number of thoughts

related to worthlessness, hopelessness, and lack of efficacy. This way of thinking may, for instance, be based on a failure experience at school during which peers and significant others denigrated the child. After the failure at school, the child may have experienced some successes, leaving the negative schema dormant, until failure was encountered again in adulthood. Schema explanations, which suggest that depressed individuals are not directly responsible for their distorted thinking, but can test and modify these negative beliefs (e.g., Beck & Dozois, 2011, 2014), may be optimal for balancing both responsibility and hope for change.

Hypotheses

The following hypotheses were evaluated: (1) A contextual explanation for depression will significantly change public stigma compared to the control condition, where a biomedical explanation will not; and (2) A cognitive distortion explanation for depression will not decrease public stigma more effectively than the control condition, but a cognitive schema explanation will significantly alter public stigma compared to the control condition. The change in public stigma is expected to be driven largely by reduced perceptions of dangerousness, reduced fear of people with depression, and reduced blame and anger (for cognitive schema and contextual explanations). Less evidence exists that contextual or cognitive explanations will lead to reduced endorsement of segregation and coercion, and changes in pity and helping. Causal attributions do not appear to influence avoidance behaviours towards people with depression (Jorm & Oh, 2009).

Methods

Participants

Undergraduates were recruited through the student participation pool at the University of Western Ontario. All participants ($n = 276$) were enrolled in a first-year psychology course.

There were more female ($n = 185$) than male ($n = 91$) participants. Ages ranged from 17 to 39 with a mean of 18.89 years. The majority of the participants were Caucasian ($n = 204$) or Asian ($n = 40$) and the remaining participants ($n = 32$) represented a variety of ethnic backgrounds.

Measures

Depression Attribution Questionnaire-27 (DAQ-27; Kanter, Rusch, & Brondino, 2008).

The DAQ-27 measures public stigma toward people with depression using 27 items, each of which is rated on a 9-point scale reflecting the degree of endorsement (1 = not at all; 9 = very much). Items include stereotypical views of people with depression (e.g., that they are unpredictable), affective responses towards people with depression (e.g., feeling anger or fear), as well as behavioural intentions (e.g., whether participants would rent an apartment to the depressed individual). Prior to completing the items, participants are presented with a vignette depicting an individual with severe depressive symptoms. In the current study, the measure was altered by giving the individual the name "Pat" (see Table 1). The purpose of this alteration was to make gender ambiguous.

The Attribution Questionnaire (AQ; Corrigan et al., 2003) which the DAQ-27 was derived from includes three items for each of nine factors. The DAQ-27 was, however, used as a unidimensional instrument in Kanter et al. (2008). We conducted an Exploratory Factor Analysis using Maximum Likelihood Extraction with a Varimax rotation and eigenvalues greater than 1 as a cut-off for determining the number of factors (see Table 1). Six factors were found to account for 55% of the variance in the overall measure. Factor 1 (Danger and Fear; $\alpha = 0.93$, 95% CI [0.91,0.94]) was a combination of the dangerousness (e.g., "I would feel threatened by Pat") and fear (e.g., "Pat would terrify me") factors reported for the AQ and included seven items. Factor 2 (Help and Pity; $\alpha = 0.82$, 95% CI [0.78,0.85]) was a composite of the pity (e.g., "I would feel

pity for Pat") and help (e.g., "How likely is it that you would help Pat?") factors reported for the AQ, and included six items. Factor 3 (Anger) was comprised of 3 items (e.g., "I would feel aggravated by Pat"; $\alpha = 0.85$, 95% CI [0.82,0.88]). This factor was the same as originally reported for the AQ. Factor 4 (Coercion and Segregation; $\alpha = 0.68$, 95% CI [0.62,0.74]) was a combination of the coercion (e.g., "If I were in charge of Pat's treatment, I would require Pat to take medication") and segregation (e.g., "I think it would be best for Pat's community if Pat were put away in a psychiatric hospital") factors reported for the AQ and included five items. The final two factors were the same as originally reported for the AQ with three items each. These factors were Blame (Factor 5; e.g., "I would think that it was Pat's own fault that Pat is in the present condition"; $\alpha = 0.69$, 95% CI [0.62,0.74]) and Avoidance (Factor 6; e.g., "I would share a car pool with Pat every day"; $\alpha = 0.69$, 95% CI [0.62,0.75]). The six factors formed the basis for the reported scale scores (which were calculated by averaging the item scores included in each factor).

Questions about Article. Participants were asked to indicate on a 7-point scale how interesting ("How interested would you be in reading more articles like this?"; 1 = not interested at all; 7 = very interested) and convincing ("Did you find the article to be convincing?"; 1 = not convincing at all; 7 = very convincing) they found the article to be.

Procedure

Participants were recruited from the university's participant research pool and were allocated to timeslots in groups of ten or fewer. The participants attended a research laboratory where they were first presented with one of four causal explanations for depression, with the exception of participants in the control condition. Conditions were randomly assigned. The casual explanations were presented in the form of a recent article published in *Science* by a

supposedly well-known depression researcher who claimed that most evidence points to depression being caused by one of biomedical, cognitive schema, cognitive distortion, or contextual factors. In the control condition, participants read an article on collaborative research between clinical psychology and social psychology. The articles were formatted to look like an excerpt from the actual journal and were of the same length (see Appendix A). Participants were informed that they would later be asked some questions regarding the information in the article. After the article was presented, participants were asked to describe the central message of the article and to indicate how interesting and credible it was. Public stigma towards individuals with depression was then measured based on a vignette depicting an individual experiencing a major depressive episode. Finally, participants provided demographic information.

Results

Preliminary Analyses

Manipulation checks were conducted to ensure that participants believed the causal explanation articles had similar characteristics and differed only in the posited cause of depression. Participants found the causal explanations equally convincing, $F(3,219) = 1.12$, $p = 0.344$, $\omega^2 < 0.01$, and interesting, $F(3,219) = 1.66$, $p = 0.178$, $\omega^2 < 0.01$. The persuasiveness of the articles was seen as key to reducing stigma. Consequently, 22 participants who rated the article persuasiveness as less than 3 out of 7 on the Likert-type scale (1 = not convincing at all) were eliminated from subsequent analyses. The cut-off point was chosen as the best compromise between assuring the integrity of the manipulation and the loss of power from excluding participants. Excluding participants who scored less than 4 out of 7 on the scale would eliminate an additional 53 participants. Of the remaining 280 participants, only four (1%) had missing values for the major outcome variables. Because of this low rate of non-response, list-wise

deletion was used. The eliminated participants ($n = 26$) did not differ significantly from other participants on any demographic variables (age, gender, and ethnicity; d 's < 0.20) and they were distributed evenly among the five participant groups.

Public Stigma

One of the main hypotheses of the study was that the causal explanations of depression would differ in their effect on public stigma, specifically the factors of danger and fear, anger, and blame. A multivariate analysis of variance (MANOVA) for these factors suggested significant differences between conditions, $F(12,712) = 1.84$, Wilk's $\Lambda = 0.92$, $p = 0.039$, partial $\eta^2 = 0.03$. The F-test for an analysis of variance (ANOVA) for the effect of causal explanations for depression on the factor comprising dangerousness and fear was statistically significant, $F(4, 271) = 3.54$, $p = 0.008$, $\omega^2 = 0.04$, as was the effect on anger, $F(4, 271) = 3.15$, $p = 0.015$, $\omega^2 = 0.03$. The effect of causal explanations on blame ($\omega^2 < 0.01$) was not significant. A multivariate analysis of variance (post-hoc) for the remaining factors suggested no significant differences between conditions, $F(12,712) = 1.13$, Wilk's $\Lambda = 0.95$, $p = 0.334$, partial $\eta^2 = 0.02$.

Post-hoc analysis (using Bonferroni adjustments) of the significant findings revealed that the cognitive distortion (mean difference = 1.0, $d = 0.62$, $p = 0.004$) and contextual explanations (mean difference = 0.8, $d = 0.55$, $p = 0.025$) were associated with less dangerousness and fear regarding people with depression than the control condition (see Table 2). The biomedical (mean difference = 0.4, $d = 0.21$, $p = 0.959$) and cognitive schema (mean difference = 0.7, $d = 0.41$, $p = 0.094$) explanations were not. The cognitive distortion (mean difference = 1.0, $d = 0.56$, $p = 0.015$), cognitive schema (mean difference = 0.9, $d = 0.52$, $p = 0.035$), and contextual explanations (mean difference = 1.0, $d = 0.57$, $p = 0.016$) were associated with less anger

towards people with depression than the control condition, whereas the biomedical explanation (mean difference = 0.5, $d = 0.29$, $p = 0.589$) was not.

Discussion

Public Stigma

The finding that a contextual explanation was associated with less public stigma than the control condition supports the initial hypothesis and is consistent with prior research (Rusch et al., 2009). The finding that a cognitive distortion explanation was associated with less public stigma compared to a control condition was unexpected considering the tenets of attribution theory. Internal causes that are believed to be under an individual's control would be expected to be more stigmatizing than other casual explanations. The presentation of a cognitive schema explanation was also associated with a reduction in public stigma compared to the control condition. The cognitive schema explanation introduced extenuating circumstances that were absent from the cognitive distortion explanation.

One surprising finding was that blame (as a factor of the DAQ-27 which is seen as resulting from attributions of responsibility) did not change significantly in any of the experimental conditions compared to the control condition, although the largest change observed was in the biomedical condition. Two factors of the DAQ-27 which did change in most of the conditions that showed significant stigma change overall were beliefs that people with depression are dangerous (and subsequent fear) and feelings of anger towards people with depression. Although anger is usually associated with blame, anger has also been found to be associated with perceptions of dangerousness (Weiner, 1995), potentially explaining our results. Reduced fear and anger can serve to encourage greater integration of people with depression in society (Weiner, 1995). This finding suggests that changing attributions of responsibility may be

less important than previously thought, and that changing perceptions of dangerousness may bring about important affective changes towards people with depression.

Limitations and Future Directions

One weakness of our current design was that we did not measure actual behavioural changes. A future study in which actual behaviour may be monitored (e.g., behaviour towards people with depression during an interaction) will increase external validity. It will also be useful to explore whether the current findings extend to a wider representation of the general public and whether stigma reduction is maintained over time.

The focus of the many current anti-stigma initiatives such as the one proposed by the MHCC is on recovery. The articles presented to participants in this study did not extend beyond causal explanations into treatment and responsibility for recovery. In the future it may be useful to explore whether causal explanations are linked to specific treatments and beliefs regarding responsibility for recovery and the overall effect that this has on recovery expectations and public stigma. The current study relied exclusively on education and the use of a longer intervention, which integrates contact and education as ways of decreasing stigma, may show even stronger results. Current anti-stigma initiatives may also present a biopsychosocial model (which incorporates biomedical, psychological, and contextual factors) when discussing the cause of depression and such a model may be more reflective of the beliefs of the general public (Pilkington, Reavley, & Jorm, 2013). This possibility and the potential influence on public stigma were not considered in the current study.

Biomedical models of depression can differ in their emphasis on biological causes. In our current study we presented chemical imbalance, genetic vulnerability, stress reactivity and hormonal changes as possible causes of depression. These causes can, however, vary in the

degree to which they influence public stigma. For example, a chemical imbalance could be seen as a temporary problem, but genetic vulnerability would be less susceptible to change. Similarly, contextual explanations could range from uncontrollable (e.g., natural disasters) to potentially more controllable events (e.g., relationship breakup).

Stigma was not measured temporally and the benefits of highlighting causal explanations of depression may well reduce over time without continuous intervention. Participants were also mostly young adults in their first year of university. Although the age of participants is very close to adolescents, who are the focus of many anti-stigma interventions for mental disorders, the findings may not be applicable to an older sample or to young adults from different backgrounds. The proportion of Asian participants in our study was fairly small and higher levels of stigma towards people with depression have been reported for this population (Shamblaw, Botha, & Dozois, in press). The findings may not be applicable to this population or other minority groups which were not well represented in our sample.

Conclusion

The results from the current research are consistent with many recent findings in the field of stigma related to depression. The current research extended recent findings by demonstrating that cognitive distortion and cognitive schema explanations for depression may also be effective in reducing public stigma. These findings can serve to inform future anti-stigma initiatives. Although a full anti-stigma program was not presented in the current design, the results suggest that emphasizing contextual and cognitive (distortion or schema) causes may be most effective in reducing public stigma. The emphasis of recent anti-stigma programs on empowerment and recovery may be best supported by highlighting psychological or contextual causes as opposed to focusing on a biomedical model of depression.

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Table 1

Factor Loadings and Communalities for DAQ-27 using Maximum Likelihood Extraction and Varimax Rotation (n=276)

Items	Communal	Danger & Fear	Help & Pity	Anger	Coersion & Segregation	Blame	Avoidance
19. How scared of Pat would you feel?	0.86	0.89	0.05	0.14	0.20	0.01	0.06
24. How frightened of Pat would you feel?	0.75	0.83	-0.01	0.12	0.13	0.06	0.19
18. I would feel threatened by Pat.	0.80	0.82	0.10	0.17	0.28	0.07	0.01
2. I would feel unsafe around Pat.	0.60	0.69	0.04	0.22	0.17	0.04	0.21
3. Pat would terrify me.	0.59	0.68	0.08	0.18	0.26	-0.10	0.12
13. How dangerous do you feel Pat is?	0.62	0.67	-0.06	0.18	0.24	-0.01	0.28
6. I think Pat poses a risk to Pat's neighbors unless Pat is hospitalized.	0.61	0.55	0.08	0.18	0.49	-0.03	0.17
20. How likely is it that you would help Pat?	0.83	0.08	0.88	0.10	0.08	0.00	0.17
8. I would be willing to talk to Pat about Pat's problems.	0.65	0.08	0.78	-0.02	0.15	-0.03	0.12
21. How certain would you feel that you would help Pat?	0.63	0.13	0.73	0.18	-0.04	-0.09	0.17
22. How much sympathy would you feel for Pat?	0.48	-0.03	0.54	0.23	-0.07	0.35	-0.01
27. How much concern would you feel for Pat?	0.37	-0.02	0.54	0.10	0.04	0.25	-0.05
9. I would feel pity for Pat.	0.28	-0.11	0.35	-0.02	-0.21	0.30	-0.09
12. How irritated would you feel by Pat?	0.71	0.25	0.12	0.78	0.04	0.05	0.17
1. I would feel aggravated by Pat.	0.70	0.23	0.15	0.77	0.08	0.04	0.12
4. How angry would you feel at Pat?	0.58	0.22	0.11	0.71	0.06	0.06	0.01
17. How much do you think an asylum, where Pat can be kept away from Pat's neighbors, is the best place for Pat?	0.59	0.33	0.13	0.05	0.67	0.08	0.02
15. I think it would be best for Pat's community if Pat were put away in a psychiatric hospital.	0.61	0.45	0.06	0.08	0.61	0.08	0.15
14. How much do you agree that Pat should be forced into treatment with a doctor even	0.25	0.22	-0.10	-0.02	0.37	-0.06	0.24

if Pat does not want to?							
5. If I were in charge of Pat's treatment, I would require Pat to take medication.	0.21	0.20	-0.02	0.13	0.32	-0.19	0.11
25. If I were in charge of Pat's treatment, I would force Pat to live in a group home.	0.21	0.27	0.05	0.00	0.32	0.14	0.13
23. How responsible, do you think, is Pat for Pat's present condition?	0.58	0.04	-0.02	0.21	0.01	0.72	0.15
11. How controllable, do you think, is the cause of Pat's present condition?	0.49	0.04	0.10	-0.10	0.02	0.69	-0.02
10. I would think that it was Pat's own fault that Pat is in the present condition.	0.48	0.07	0.26	0.41	0.14	0.47	0.02
7. If I were an employer, I would interview Pat for a job.*	0.39	0.13	0.09	0.07	0.05	0.00	0.60
26. If I were a landlord, I probably would rent an apartment to Pat.*	0.44	0.26	0.04	0.18	0.22	0.06	0.54
16. I would share a car pool with Pat every day.*	0.47	0.19	0.32	0.05	0.21	0.07	0.53
Eigen		4.64	2.94	2.32	1.89	1.60	1.38

Note. Boldface indicates highest loading; * = reverse coded

Table 2

Descriptive Statistics for the Effect of Causal Explanation Primes on Major Outcome Variables

	Causal Explanation (Mean Scale Score [1-9]; <i>SD</i>)				
	Biomedical	Contextual	Cognitive	Schema	Control
Danger and Fear	3.3 (1.7)	2.8 (1.3)*	2.6 (1.5)**	3.0 (1.6)	3.6 (1.8)
Help and Pity	7.1 (1.3)	7.2 (1.0)	7.1 (1.4)	7.2 (1.1)	6.8 (1.2)
Anger	4.2 (1.9)	3.7 (1.9)*	3.7 (1.9)*	3.8 (1.8)*	4.7 (1.8)
Coercion and					
Segregation	4.1 (1.4)	3.7 (1.3)	3.5 (1.3)	3.6 (1.3)	3.9 (1.3)
Blame	4.2 (1.4)	4.4 (1.5)	4.4 (1.4)	4.4 (1.6)	4.8 (1.4)
Avoidance	4.9 (1.7)	5.2 (1.8)	5.3 (1.7)	5.1 (1.9)	4.7 (1.7)

* = significantly different from control after Bonferroni adjustments ($p < 0.05$); ** = $p < 0.01$

Appendix A

Causal Explanation Articles and Instructions

Instructions

Article task

Please read the article on the next page carefully. You will be asked some questions regarding the content of the article afterwards. This article was published in the August, 28th edition of *Science* this year. *Science* is a journal that covers the latest news in the social and natural sciences and is highly regarded in academic circles.

Biomedical Article

“Depression is largely the result of biomedical factors.” This was the primary finding in an article recently published in *Clinical Psychology Review*. The author of the article, Dr. Harris Segal from Harvard University, is a world-renowned expert in the area of depression research. Dr. Segal and colleagues conducted a comprehensive review of research in the causes of depression. He states: “After considering all the evidence that has accumulated over the last 30 years, we have to conclude that biomedical factors such as neurotransmitter balances in the brain, dysfunction of the hypothalamic-pituitary-adrenal axis, hormonal processes, and genetic vulnerability are the primary cause of depression. An example of this is where a person does not have sufficient amounts of the neurotransmitter, serotonin in his or her brain and then becomes depressed.” This review was welcomed by other depression researchers who now seek to build upon the foundation laid by Dr. Segal.

Contextual Article

“Depression is largely the result of contextual factors.” This was the primary finding in an article recently published in *Clinical Psychology Review*. The author of the article, Dr. Harris

Segal from Harvard University, is a world-renowned expert in the area of depression research. Dr. Segal and colleagues conducted a comprehensive review of research in the causes of depression. He states: “After considering all the evidence that has accumulated over the last 30 years, we have to conclude that contextual factors such as stressful life situations, traumatic and humiliating experiences, the suffering of loss, and being trapped in adverse conditions are the primary cause of depression. An example of this can be found during periods of war when trauma and humiliating experiences lead to depression in many survivors of the war.” This review was welcomed by other depression researchers who now seek to build upon the foundation laid by Dr. Segal.

Cognitive Distortion Article

“Depression is largely the result of cognitive factors.” This was the primary finding in an article recently published in *Clinical Psychology Review*. The author of the article, Dr. Harris Segal from Harvard University, is a world-renowned expert in the area of depression research. Dr. Segal and colleagues conducted a comprehensive review of research in the causes of depression. He states: “After considering all the evidence that has accumulated over the last 30 years, we have to conclude that distorted thinking patterns are the primary cause of depression. An example of distorted thinking is believing that because you failed a test, that your whole life will be a failure i.e., overgeneralizing. When this thinking pattern continues over a sufficient period of time, depression eventually develops.” This review was welcomed by other depression researchers who now seek to build upon the foundation laid by Dr. Segal.

Cognitive Schema Article

“Depression is largely the result of cognitive factors.” This was the primary finding in an article recently published in *Clinical Psychology Review*. The author of the article, Dr. Harris

Segal from Harvard University, is a world-renowned expert in the area of depression research. Dr. Segal and colleagues conducted a comprehensive review of research in the causes of depression. He states: “After considering all the evidence that has accumulated over the last 30 years, we have to conclude that negative cognitive schemas, i.e. closely linked thoughts and associations that originate in childhood, are the primary cause of depression. A child may for example experience derision from others after failing at school. When failure occurs again in adulthood, the formerly dormant negative schema is triggered and negative thoughts and feelings occur which eventually leads to depression”. This review was welcomed by other depression researchers who now seek to build upon the foundation laid by Dr. Segal.

Control Condition Article

“Collaboration is the future of research in psychology.” This was the primary finding in an article recently published in *Clinical Psychology Review*. The author of the article, Dr. Harris Segal from Harvard University, has been collaborating with colleagues in social and cognitive psychology for over 30 years. Dr. Harris states: “When you look at the articles that have appeared in clinical psychology journals over the last 10 years, you are struck by how much researchers from areas other than clinical psychology now appear as co-authors. Clinical psychology may be the experts on the subject of mental disorders, but it is personality psychologists who understand how personality traits may influence the behaviour of someone with a mental disorder, and social psychologists who understand how the social milieu affects the same individual. Working with colleagues in other fields will enrich our understanding of mental disorders and create exciting new avenues of research.”