# BRIEF REPORT

# Depressive implicit associations and adults' reports of childhood abuse

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Theory and research suggest that negative events in childhood (e.g., childhood abuse) may contribute to the development of a cognitive vulnerability to depression. A limitation of past research, however, is that the majority has focused on explicit cognitions (e.g., attributional style) and it remains unclear whether similar relations would be observed for more implicit measures of depressive cognitions. This study investigated the relation between young adults' reports of childhood abuse and their implicit depressive cognitions, as measured by the Implicit Association Test. As hypothesised, young adults reporting a history of childhood abuse exhibited stronger implicit associations for depression-relevant stimuli than did individuals with no abuse history. These results were maintained even after statistically controlling for the influence of current depressive symptom levels.

*Keywords:* Implicit cognitions; Depression; Childhood abuse; IAT.

Cognitive theorists (e.g., Clark, Beck, & Alford, 1999) have proposed that negative schema contribute to the development and maintenance of depression. Supporting cognitive models of depression, there is growing evidence that various forms of cognitive vulnerability predict the development and maintenance of depressive symptoms and diagnoses (see Clark et al., 1999; Haeffel et al., 2008; Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008, for reviews). Given this, it is important to gain a better understanding of how these cognitive vulnerabilities develop so that more effective prevention and early interventions can be devised.

Theorists (e.g., Clark et al., 1999; Rose & Abramson, 1992) have suggested that negative experiences during childhood (e.g., childhood abuse) may contribute to the development of cognitive vulnerability to depression. Consistent with these theories, there is considerable support for the link between early negative life experiences and depressive cognitive styles. For example, there is evidence that emotional abuse by parents and verbal victimisation from peers contributes to the development of depressive cognitions in children (e.g., Gibb & Abela, 2008). Furthermore, the link between negative childhood experiences and cognitive vulnerability

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to depression appears to persist into adulthood (e.g., Gibb et al., 2001).

Despite the strengths of this research, a limitation is that the majority of studies investigating developmental correlates of cognitive vulnerabilities have focused on explicit, self-report measures of these cognitions (Ingram, Miranda, & Segal, 1998). Theorists (e.g., Beevers, 2005), however, have emphasised the distinction between explicit (reflective) and implicit (associative) cognitions. Explicit cognitions are those that are generated effortfully and with awareness, whereas implicit cognitions are automatically activated evaluative judgements that typically occur outside conscious awareness. Measures of implicit and explicit cognition are only modestly correlated (see Nosek & Smyth, 2007, for a review) and are thought to have different neural substrates and different roles in contributing vulnerability to depression (see Beevers, 2005). Importantly for the current study, implicit cognitions are thought to reflect associations that have been learned through repeated experiences (Beevers, 2005). In his dual-process model, Beevers proposed that cognitive vulnerability is initially conferred by implicit depressive cognitions, and that this risk may be either mitigated or exacerbated by explicit, reflective cognitions.

Recently, researchers have begun examining these types of implicit depressive cognitions using a variation of the Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998; Greenwald, Nosek, & Banaji, 2003). Although there have been some concerns regarding the psychometric properties of the IAT, recent reviews have supported its construct validity, including concurrent and predictive validity (see, e.g., Nosek & Smyth, 2007). Although the IAT was originally used to measure implicit attitudes and prejudices (Greenwald et al., 1998), it has since been modified to measure implicit associations among individuals with various types of psychopathology including depression. Thus far, this research has yielded mixed support for the role of implicit cognitions in depression. For example, there is evidence that individuals with remitted depression, compared to controls, exhibit

a reduced tendency to associate the self with happiness (Meites, Deveney, Steele, Holmes, & Pizzagalli, 2008). Additionally, Franck, De Raedt, Dereu, and Van den Abbele (2007) found that non-suicidal depressed individuals demonstrated more negative implicit associations than controls; however, non-suicidal depressed individuals also exhibited more negative implicit associations than suicidal depressed individuals (see also Gemar, Segal, Sagratti, & Kennedy, 2001). Also, one study found evidence of more positive, rather than more negative, implicit cognitions in currently depressed individuals compared to controls (De Raedt, Schacht, Franck, & De Houwer, 2006). Importantly, and consistent with cognitive models of depression risk (e.g., Beevers, 2005; Clark et al., 1999), there is evidence that implicit depressive cognitions moderate the relation between negative events and prospective changes in depressive symptoms (e.g., Haeffel et al., 2007; Steinberg, Karpinski, & Alloy, 2007). Considered together, therefore, despite some mixed findings, there is growing support for the role of negative implicit cognitions in depression. What remains unclear is whether these implicit measures of cognitive vulnerability demonstrate similar developmental correlates as those observed for explicit measures of cognitive vulnerability to depression. This said, theorists have proposed that implicit cognitions are formed via repeated pairings of negative experiences such as abuse during childhood and views of oneself (Beevers, 2005), suggesting that similar relations should be observed. Given evidence that both explicit and implicit cognitions contribute vulnerability to depression (Clark et al., 1999; Haeffel et al., 2007, 2008; Steinberg et al., 2007), understanding whether both forms of cognitive bias have similar developmental correlates will help to inform future prevention efforts designed to reduced risk for the initial development of these biases.

The goal of the current study was to examine the relation between reported histories of childhood abuse and young adults' implicit associations for depression-relevant stimuli. We hypothesised that individuals reporting an abuse history would show stronger depression-relevant implicit associations

than individuals reporting no history of childhood abuse. To the extent that this relation reflects the enduring impact of childhood abuse on young adults' implicit associations, it should be at least partially independent of current depressive symptom levels. Therefore, we also hypothesised that the link between reported histories of abuse and depression-relevant implicit associations would be maintained even after statistically controlling for the influence of participants' current depressive symptoms.

## METHOD

### Participants

Participants in the current study were 201 female undergraduate students. The participants ranged in age from 18 to 22 years with a mean sample age of 18.87 ($SD = 1.03$). The racial/ethnic composition was 64% Caucasian, 11% African American, 13% Asian, 6% Hispanic, and 6% from other racial/ethnic groups.

### Measures

The Childhood Trauma Questionnaire (CTQ; Bernstein & Fink, 1998; Bernstein et al., 2003) was used to assess participants' histories of childhood abuse. Each item is rated on a 5-point Likert-type scale, with response options ranging from "*never true*" to "*very often true*". Subscale scores are calculated by summing responses within each abuse type, with higher scores indicating more severe abuse. The CTQ has demonstrated excellent psychometric properties in both clinical and non-clinical samples, including high levels of concurrent validity with therapists' ratings of abuse (Bernstein et al., 2003). Each of the CTQ subscales exhibited good internal consistency in the current study (emotional abuse, $\alpha = .80$; physical abuse, $\alpha = .80$; sexual abuse, $\alpha = .94$). Because of the extreme skew of the CTQ subscales in our sample combined with a high rate of comorbidity between abuse subtypes, a dichotomous classification was created for reported histories of abuse (abused vs. not abused). Consistent with previous studies (e.g., Bradley

et al., 2008), to be classified as having a history of abuse, the participant must have scored in the "moderate" to "severe" range on at least one of the CTQ subscales (i.e., a score greater than 12, 9, or 7 for the emotional, physical, and sexual abuse scales, respectively; cf. Bernstein & Fink, 1998). Using this criterion, 37 participants (19.4%) were classified as having a history of moderate to severe abuse.

The Implicit Association Test (Greenwald et al., 1998, 2003) was used to assess depressive implicit associations among study participants. In this task, participants are presented with a stimulus (word) on the computer screen and are asked to categorise the word as quickly as possible into one of two superordinate categories shown in the upper-left- and upper-right-hand corners of the screen. For example, on some trials, participants are asked to categorise words as good (e.g., smart) versus bad (e.g., stupid) by pushing the left or right button on a response box. On other trials, participants are asked to classify words as self-relevant (Me; e.g., I, mine) or other-relevant (Not Me; e.g., they, them). Critical trials are presented in two blocks, the order of which is counterbalanced across participants. In the one block, participants must push the same button in response to both "good" and "me" words and the other button for "bad" and "not me" words. In the other block, participants must push the same button for "bad" and "me" words and another button for "good" and "not me" words. The IAT rests on the assumption that it is easier to make the same behavioural response (i.e., a key press) to concepts that are strongly associated with one another than to concepts that are weakly associated with one another (Greenwald et al., 1998). A summary score is then created by calculating a $D$ score for each subject by computing the difference in mean latency between the depression "compatible" (e.g., bad + me) and "incompatible" (e.g., bad + not me) conditions and dividing by the standard deviation of response latency for all trials (Greenwald et al., 2003). Positive $D$ scores reflect relatively faster responding (a stronger association) when "me" and "bad", for example, are paired, and negative $D$ scores reflect relatively slower responding (a weaker association). As in past research, response latencies longer than 10,000 ms

(10 seconds) were excluded (0.05% of all trials; cf. Greenwald et al., 2003). Latencies for IAT trials with errors were not excluded due to research suggesting that these errors enhance IAT effects (Greenwald et al., 2003).

Depressive symptoms were assessed using the Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996), which is a 21-item self-report questionnaire. A number of studies have supported reliability and validity of the BDI-II (e.g., Beck et al., 1996), and the measure exhibited good internal consistency in this sample ($\alpha = .90$).

## RESULTS

Preliminary analyses were conducted to examine the distributions of both BDI-II and IAT $D$-score variables. Results of these analyses indicate that BDI-II, but not IAT $D$-score, exhibited significant skew. As a result, BDI-II scores were transformed using a square root function to satisfy assumptions of normality prior to further analyses. Women in this study reported a wide range of depressive symptoms; however, on average, scores on the BDI-II fell in the minimal range of severity ($M = 7.86$, $SD = 7.20$; range $= 0–36$). Further, preliminary analyses revealed that women reporting a history of abuse exhibited higher depressive symptom levels ($M = 13.41$; $SD = 8.03$) than women reporting no abuse history ($M = 6.52$; $SD = 6.31$), $t(199) = 5.56$, $p < .001$, $r_{\text{effect size}} = .37$. Also, women's depressive symptoms were positively correlated with their levels of depressive implicit cognitions, $r = .20$, $p = .005$.

Focusing next on the relation between reports of abuse and implicit associations, we found that women who reported a history of childhood abuse exhibited more depressive implicit associations ($D$ score $M = -0.34$, $SD = 0.22$) than women with no child abuse history ($D$ score $M = -0.47$, $SD = 0.25$), $F(1, 198) = 8.50$, $p = .004$, $\eta_p^2 = .04$. Importantly, this relation was maintained even after statistically controlling for the influence of participants' current depressive symptoms, $F(1, 197) = 4.13$, $p = .04$, $\eta_p^2 = .02$.

## DISCUSSION

The primary goal of this study was to determine whether the relation between negative life events in childhood and explicit depressive cognitions observed in previous studies (e.g., Gibb & Abela, 2008; Gibb et al., 2001) would extend to a measure of implicit depressive cognitions. Consistent with our hypothesis, we found that women reporting a history of childhood abuse, compared to those with no abuse history, exhibited stronger implicit associations for depression-relevant stimuli. Importantly, this link was maintained even after statistically controlling for the influence of current depressive symptom levels, suggesting that the relation cannot be attributed to the presence of current depression.

Although causal conclusions cannot be drawn given the cross-sectional design of our study, the results are consistent with the hypothesis that negative experiences such as abuse during childhood may contribute to the development of implicit depressive cognitions. An important avenue for future research is to determine whether negative experiences in childhood prospectively predict the development of implicit depressive cognitions. Although ethical concerns obviously preclude examining the effects of ongoing child abuse, future research could investigate how milder types of negative life events, such as peer victimisation or maternal criticism, contribute to the development of negative implicit cognitions (cf. Gibb & Abela, 2008). Another important question for future research is, to the extent that similar childhood experiences contribute to the development of depressive implicit and explicit cognitions, whether the development of these two types of cognitive vulnerability is concurrent or sequential.

In addition to the study's cross-sectional design, there are other limitations that should be noted. First, no explicit measure of depressive cognitions was included in this study. This decision was made given time considerations and because we were primarily interested in whether the relation between adults' reports of childhood abuse and explicit measures of depressive cognition that have

been repeatedly observed (e.g., Gibb et al., 2001; Maciejewski & Mazure, 2006) would also be observed for a measure of implicit cognition. Future research, however, should seek to measures of both implicit and explicit cognition, which would facilitate a direct comparison of the developmental correlates of one form of cognition versus the other. An additional limitation is that the study focused exclusively on undergraduate women. This decision was made given that women are twice as likely as men to develop depression (see Nolen-Hoeksema & Hilt, 2009, for a review). Future research is necessary to determine whether the results will generalise to men and to more representative samples (e.g., community samples). Related to this, the levels of depressive symptoms observed in our study were fairly mild. Although this helps to strengthen our argument that the observed results were not due simply to the presence of current depression, it may also have influenced the levels of depressive cognition observed in our sample. Specifically, the sample consisted of relatively high-functioning college students who, as a whole, tended to exhibit fairly positive implicit cognitions. Therefore, even though we observed the predicted abuse group differences in implicit cognitions, the abused group simply reported less positive rather than extremely negative cognitions. Future research is needed to determine whether more strongly valenced differences would be observed in a more representative sample, or a sample with more significant levels of depression. Additionally, although the CTQ is a widely used measure for quantifying histories of abuse and has shown good reliability and strong concurrent reliability with therapists' ratings of abuse (Bernstein et al., 2003), future research would benefit from the inclusion of structured interviews for the assessment of abuse. Another limitation is that the IAT was always administered after the CTQ and it is possible that this fixed order affected the magnitude of the relation between these measures. This said, a recent review of the IAT found no evidence of order effects based on whether self-report measures of cognition were administered before versus after the IAT (Nosek, Greenwald, & Banaji, 2005), though it is unclear whether priming effects may be more

likely with the CTQ. Despite this, future research would benefit from a counter-balanced administration of the CTQ and IAT to more definitively rule out any potential bias that may result from sequential administration. Finally, additional research is also needed to examine potential moderators and mediators of the relation between childhood abuse and depressive implicit cognitions. Potential moderators include, but are not limited to, severity and timing of abuse in childhood (see Manly, Kim, Rogosch, & Cicchetti, 2001), the presence and type of social support, as well as other forms of cognitive vulnerability such as rumination (cf. Nolen-Hoeksema et al., 2008).

In conclusion, the current results extend previous findings in suggesting that women's reports of childhood abuse are related to depressive implicit associations, a relation that was independent of women's current depressive symptom levels. As such, the current results complement those obtained in previous research suggesting that negative events during childhood contribute to the development of explicit depressive cognitions (e.g., attributional style) in children (Gibb & Abela, 2008). Future research is needed to examine the actual development of depressive implicit associations and to determine factors that may exacerbate or buffer the effects of environmental stress on the development of both implicit and explicit depressive cognitions.

# REFERENCES

Beck, A. T., Steer, R. A., & Brown, G. K. (1996). *Beck Depression Inventory manual* (2nd ed.). San Antonio, TX: The Psychological Corporation.

Beevers, C. G. (2005). Cognitive vulnerability to depression: A dual process model. *Clinical Psychology Review, 25*, 975–1002.

Bernstein, D. P., & Fink, L. (1998). *Childhood Trauma Questionnaire: A retrospective self- report*. San Antonio, TX: The Psychological Corporation.

Bernstein, D. P., Stein, J. A., Newcomb, M. D., Walker, E., Pogge, D., Ahluvalia, T., et al. (2003). Development and validation of a brief screening version of the Childhood Trauma Questionnaire. *Child Abuse & Neglect, 27*, 169–190.

Bradley, R. G., Binder, E. B., Epstein, M. P., Tang, Y., Nair, H. P., Liu, W., et al. (2008). Influence of child abuse on adult depression: Moderation by the corticotropin-releasing hormone receptor gene. *Archives of General Psychiatry, 65*, 190–200.

Clark, D. A., Beck, A. T., & Alford, B. A. (1999). *Scientific foundations of cognitive theory and therapy of depression*. New York: Wiley.

De Raedt, R., Schacht, R., Franck, E., & De Houwer, J. (2006). Self-esteem and depression revisited: Implicit positive self-esteem in depressed patients? *Behaviour Research and Therapy, 44*, 1017–1028.

Franck, E., De Raedt, R., Dereu, M., & Van den Abbele, D. (2007). Implicit and explicit self-esteem in currently depressed individuals with and without suicidal ideation. *Journal of Behavior Therapy and Experimental Psychiatry, 38*, 75–85.

Gemar, M. C., Segal, Z. V., Sagratti, S., & Kennedy, S. J. (2001). Mood-induced changes on the implicit association test in recovered depressed patients. *Journal of Abnormal Psychology, 110*, 282–289.

Gibb, B. E., & Abela, J. R. Z. (2008). Emotional abuse, verbal victimization, and the development of children's negative inferential styles and depressive symptoms. *Cognitive Therapy and Research, 32*, 161–176.

Gibb, B. E., Alloy, L. B., Abramson, L. Y., Rose, D. T., Whitehouse, W. G., Donovan, P., et al. (2001). History of childhood maltreatment, negative cognitive styles, and episodes of depression in adulthood. *Cognitive Therapy and Research, 25*, 425–446.

Greenwald, A. G., McGhee, D. E., & Schwartz, J. L. K. (1998). Measuring individual differences in implicit cognition: The Implicit Association Test. *Journal of Personality and Social Psychology, 74*, 1464–1480.

Greenwald, A. G., Nosek, B. A., & Banaji, M. R. (2003). Understanding and using the Implicit Association Test: I. An improved scoring algorithm. *Journal of Personality and Social Psychology, 85*, 197–216.

Haeffel, G. J., Abramson, L. Y., Brazy, P. C., Shah, J. Y., Teachman, B. A., & Nosek, B. A. (2007). Explicit and implicit cognition: A preliminary test of a dual-process theory of cognitive vulnerability to depression. *Behaviour Research and Therapy, 45*, 1155–1167.

Haeffel, G. J., Gibb, B. E., Metalsky, G. I., Alloy, L. B., Abramson, L. Y., Hankin, B. L., et al. (2008). Measuring cognitive vulnerability to depression: Development and validation of the Cognitive Style Questionnaire. *Clinical Psychology Review, 28*, 824–836.

Ingram, R. E., Miranda, J., & Segal, Z. V. (1998). *Cognitive vulnerability to depression*. New York, NY: Guilford Press.

Maciejewski, P. K., & Mazure, C. M. (2006). Fear of criticism and rejection mediates an association between childhood emotional abuse and adult onset of major depression. *Cognitive Therapy and Research, 30*, 105–122.

Manly, J. T., Kim, J. E., Rogosch, F. A., & Cicchetti, D. (2001). Dimensions of child maltreatment and children's adjustment: Contributions of developmental timing and subtype. *Development and Psychopathology, 13*, 759–782.

Meites, T. M., Deveney, C. M., Steele, K. T., Holmes, A. J., & Pizzagalli, D. A. (2008). Implicit depression and hopelessness in remitted depressed individuals. *Behaviour Research and Therapy, 46*, 1078–1084.

Nolen-Hoeksema, S., & Hilt, L. M. (2009). Gender differences in depression. In I. H. Gotlib & C. L. Hammen (Eds.), *Handbook of depression* (2nd ed., pp. 386–404). New York: Guilford Press.

Nolen-Hoeksema, S., Wisco, B. E., & Lyubomirsky, S. (2008). Rethinking rumination. *Perspectives on Psychological Science, 3*, 400–424.

Nosek, B. A., Greenwald, A. G., & Banaji, M. R. (2005). Understanding and using the Implicit Association Test: II. Method variables and construct validity. *Personality and Social Psychology Bulletin, 31*, 166–180.

Nosek, B. A., & Smyth, F. L. (2007). A multitrait–multimethod validation of the Implicit Association Test. *Experimental Psychology, 54*, 14–29.

Rose, D. T., & Abramson, L. Y. (1992). Developmental predictors of depressive cognitive style: Research and theory. In D. Cicchetti & S. L. Toth (Eds.), *Rochester symposium on developmental psychopathology* (Vol. IV, pp. 323–349). Rochester, NY: University of Rochester Press.

Steinberg, J. A., Karpinski, A., & Alloy, L. B. (2007). The exploration of implicit aspects of self-esteem in vulnerability-stress models of depression. *Self and Identity, 6*, 101–117.