# Causal links between external contingencies of self-worth and mindfulness

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**Abstract**

Outcome research confirming the salutary effects of mindfulness-based interventions has proliferated in the last fifteen years. In contrast, there has been very little research into intra-individual factors that may enhance or inhibit mindfulness. The present study examined a proposal by Brown, Ryan and Creswell (2007a) that external contingent self-worth may act as an inhibiting factor of mindfulness. Undergraduate participants performed two reading tasks; one under neutral conditions and one under the influence of an academic ego-threat. Momentary mindfulness levels were measured retrospectively following both reading tasks. It was expected that levels of academic competence contingent self-worth would predict changes in momentary mindfulness levels between the ego-threat and neutral condition, and, in addition, that worry would mediate the relationship. The study findings supported both hypotheses. The theoretical implications of the study are discussed in relation to the salience of self-investment in present moment events as a controlling variable of levels of momentary mindfulness.

Key words: Mindfulness, Contingencies of self-worth, Ego involvement, Worry.

**Introduction**

Mindfulness is usually conceptualised in terms of enhanced attention to, and awareness of, current experience or present reality; such awareness is further characterised by curiosity, openness and acceptance (Brown & Ryan, 2003). Mindfulness may be contrasted with 'mindlessness' wherein attention is directed away from present-moment experience, such as when fantasising about the future or ruminating about the past. While it is possible to become more mindful via formal training programmes that typically last about eight weeks (Kabat-Zinn, 1990), naturally-occurring individual differences in mindfulness have also been shown to exist (Brown & Ryan, 2003).

Outcome studies reporting the benefits of mindfulness-based interventions, across a range of clinical and non-clinical populations, have proliferated in recent years (Baer 2003; Grossman, Niemann, Schmidt & Walach, 2004; Hoffmann, Sawyer, Witt & Oh, 2010). Explanatory accounts of such benefits (e.g., Baer, 2003; Teasdale, Moore, Hayhurst et al., 2002) suggest that mindfulness promotes a "shift in cognitive set to a decentred mode of processing in which the individual is no longer personally identified with mental (and external) events, but rather relates to them in a wider context or field of awareness" (Teasdale et al., 2002, p.276). In essence, events are registered directly as they occur and no additional conceptual elaboration takes place (Brown & Ryan, 2003). This decentred mode of processing may be distinguished from a conceptually-driven alternative: instead of experiencing the present moment directly, thought-generated accounts of it are attended to instead (Brown, Ryan & Creswell, 2007a). Various forms of cognitive filtering are applied to such accounts before they reach awareness (Brown, Ryan, Creswell & Niemiec, 2008). Shifting from a conceptually-driven mode of

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processing to a decentred one is thought to underpin the beneficial effects of mindfulness training in three ways: first, by increasing willingness to tolerate uncomfortable emotions (Hayes, Strosahl & Wilson, 2011); second, by reducing emotional reactivity to negative emotional events (Kabat-Zinn, 1990); and third, by inhibiting habitual response patterns when more flexible responding is optimal for the situation (Bishop, Lau, Shapiro, et al., 2004). Hitherto, there has been a dearth of research into the factors that maintain individuals in a conceptually-driven mode of processing and that inhibit them from shifting to a decentred mode (Brown et al., 2007a). The current study sets out to address this significant gap in the literature.

An important distinction between the decentred and conceptually-driven processing modes is emphasised in Buddhist accounts of mindfulness (e.g., Brazier, 2003). Basically, the conceptually-driven mode is primarily invested in evaluating internal and external events in relation to their impact on the self, whereas the decentred mode registers and discerns events without engaging in such self-referent evaluation. Rather than being a real entity in its own right, the 'self' referred to is posited to be a constructed self-image or mental model formed from conceptual elaborations on life experiences and shaped by the social and cultural contexts in which the individual operates (Brown et al., 2008). Consistent with this account, Brown et al. (2007a) have argued that contexts which activate ego-involvement will facilitate an individual's tendency to engage in conceptually-driven processing at the expense of decentred processing. Ego-involvement can be described as "an internal state in which a person's self-esteem is contingent on certain (external) outcomes - for example, achieving a certain status, acquiring a certain object or being positively evaluated in a certain way" (Brown et al, 2007b; p.279).

Crocker, Luhtanen, Cooper & Bouvrette (2003) refer to these contexts as 'self-worth contingencies'. By evoking a conceptually-driven processing mode, these self-worth contingencies are hypothesised to inhibit the emergence of mindfulness (Brown et al., 2007a). This claim has attracted some correlational support (Brown & Ryan, 2003; Brown & Kasser, 2005) but evidence of a causal link has yet to be established.

The present study set out to test the above account by focusing on the external domain of academic competence in undergraduate students, one of seven sources of self-worth identified by Crocker et al (2003). Participants' momentary mindfulness levels were measured on two occasions: under a no-threat condition and under an academic ego-threat condition. The latter was designed to activate academic competence self-worth contingencies. It was predicted that higher levels of academic self-worth contingency would be associated with greater reductions in momentary mindfulness from the neutral condition to the ego-threat condition (H1).

Intermediary processes bridging the anticipated association between academic self-worth contingencies and reductions in momentary mindfulness under ego-threat can be hypothesised from Fennell's (1997) cognitive model of low-self-esteem. According to the model, people develop rules for living in order to cope with negative core beliefs about themselves. These rules map onto what Beck (1976) labelled as dysfunctional conditional assumptions (McManus, Waite & Shafran, 2009) and are equivalent to self-worth contingencies. As long as the terms of the contingency are met, self-esteem may be maintained (Fennell & Jenkins, 2004). However, if the contingency's terms are threatened then the core belief becomes activated and anxious preoccupation follows. Since anxious thoughts are threatening to the self, the Buddhist account (Brazier, 2003)

would suggest that they will be more difficult to decentre from than neutral equivalents. Reductions in momentary mindfulness would inevitably follow. Therefore, it may be hypothesised that anxious thinking, and in particular worry, will mediate the proposed association between academic competence self-worth contingency and mindfulness. This constitutes the second hypothesis (H2).

**Method**

Participants

The sample comprised mainly of first-year undergraduate students who participated for course credits. As the study's ego-threat relied on participants being deceived into believing that their weak performance on a difficult verbal abilities task was indicative of poor future academic prospects, participants who did not have English as a first language or who were above thirty-five years of age were excluded. The final sample (N = 72) was predominantly female (85%) and Caucasian (53%), with most participants aged between 17 and 21 years.

Design overview

All participants completed a questionnaire booklet comprising of measures of Academic Competence Self-worth Contingency and Worry. They also completed both the ego-threat and neutral conditions of the study, the order of conditions being counter-balanced. Some participants were subjected to the ego-threat first and this was followed by a reading task. Immediately thereafter they completed a measure of state mindfulness and mood indicating, retrospectively, how they felt during the reading task. They then

completed a second reading task and further measures of state mindfulness and mood (again indicating their immediate retrospective feelings). Other participants completed a reading task first followed by retrospective measures of state mindfulness and mood. They then completed the ego-threat condition, a reading task and final measures of state mindfulness and mood. Reading material was counterbalanced across condition order. In formal terms, the design comprised of one within-participants factor with two levels (condition: ego-threat/neutral) and two between-participant factors with two levels each (condition presentation order: ego-threat followed by neutral or neutral followed by ego-threat; reading task presentation order: reading task A followed by reading task B or vice versa). The dependent variable was change in state mindfulness experienced during the reading tasks from the neutral condition to the ego-threat condition.

Materials

*Academic Competence Self-Worth Contingency*

This was measured using the five-item Academic Competence Subscale of the Contingencies of Self-Worth Scale (CSWS; Crocker et al., 2003). Participants rated their agreement with each item statement on a seven-point Likert Scale (1 = Strongly Disagree, 7 = Strongly Agree). A typical item was … *My self-esteem gets a boost when I get a good grade on an exam or piece of coursework*. Higher scores reflected greater levels of academic competence self-worth contingency ($\alpha = 0.79$). The five items were embedded among two further subscales of the CSWS, namely God's Love and Virtue. These filler items were included to partly disguise the purpose of the study and were not included in the analysis.

*Worry*

Worry was measured using the 16-item Penn State Worry Questionnaire (PSWQ; Meyer, Miller, Metzger & Borkovec, 1990). Participants indicated on a five-point Likert Scale how typically each item statement reflected their own experience (1 = Not at all typical, 5 = Very typical). An example item was … *As soon as I finish one task I start to worry about everything else I have to do*. Higher scores reflected greater levels of trait worry (α = 0.92).

*Ego-threat condition*

The ego-threat condition was adapted from Park & Crocker (2004). Participants were given written instructions and a 'test' paper; the latter was described as a verbal abilities test and was attributed to McFarlin and Blascovich (1984). They were deliberately misinformed that test scores accurately predicted undergraduate degree performance and acceptance onto both postgraduate training courses and employers' graduate training programmes. They were also wrongly informed that the average test score for UK university students was 7.5 questions correct out of twelve and 7.8 questions correct in their particular institution. They were told they would have five minutes to complete the test and that they would be informed of their score shortly thereafter. The test contained 12 word triads with the task being to identify a fourth related word in each case. Pilot-testing revealed that three of the word triads could be solved relatively easily whereas the remaining nine were virtually insoluble. For example, on one of the easier trials the words 'Shelf' 'Read' and 'Cook' were presented and the required answer was 'Book'. A difficult/impossible trial involved presenting word triads such as 'Win' 'Complex' and 'Mine'. Two examples of word triads and their solutions were given at the outset to

orientate participants to task requirements. On completion, participants' answer sheets were marked by the researcher at the front of the testing room to give the impression that participants' test scores would soon be returned. However, it was assumed that participants would be aware that they achieved three correct answers at best and that, in line with the study's preamble, this compared badly with other students' performance, both nationally and locally.

*Reading tasks*

Participants read one of two short typed articles (Article A or Article B) at their own pace. Both articles contained approximately 480 words and were extracted from longer pieces in professional forum publications (Article A from Moss (2008) in an optometry publication and Article B from Prais (2008) in a legal publication). Both articles had been found in pilot testing to be slightly (as opposed to highly) interesting to undergraduate Psychology students.

*State mindfulness*

Momentary levels of mindfulness were measured using the five-item state version of the Mindful Attention Awareness Scale (State MAAS; Brown & Ryan, 2003) modified to fit with the requirements of the current task. Participants were asked to think back on their experience of reading the article in the immediately preceding experimental phase and to indicate on a seven-point Likert scale the degree to which each item statement reflected that experience (0 = Not at all, 6 = Very Much). Example items were … *I was rushing through the article without being attentive to it; I found it difficult staying focused on the article*. State mindfulness scores were derived by reverse-scoring the five items. Higher

scores reflected higher levels of momentary mindfulness (alphas were 0.84 and 0.88 in the neutral and ego-threat conditions, respectively).

*Mood*

Mood was measured using a three-item self-report questionnaire adapted from Park and Crocker (2004). Participants were asked to think back on their experience of reading the article in the preceding reading task and to indicate on a seven-point Likert scale (0 = Not at all, 6 = Very much) the extent to which they felt agreeable (item 1), unhappy (item 2) and irritated (item 3) while doing so.

Procedure

Participants were tested in groups but seated apart and asked not to communicate with each other during testing. Questionnaire measures of academic self-worth contingency, worry and demographics were completed initially. Once the ego-threat task had been completed the participants engaged in one of the reading tasks (while their tests were apparently being scored by the experimenter). Before going on to complete the state mindfulness and mood measures they were all fully debriefed. They were informed that neither the average scores stated, nor the information about the predictive utility of the verbal abilities test, was true and that the test had been specifically designed to make it extremely difficult to score higher than 3 out of 12. State measures of mindfulness and mood pertaining to the preceding reading task were taken directly following the reading task in the neutral condition, and following debriefing in the ego-threat condition. The ordering of the two study conditions was counterbalanced across test sessions to reduce

order effects and the order of presentation of the two articles (A or B) was counterbalanced across participants.

**Results**

Ego-threat manipulation check

Because the ego-threat task was explicitly designed to challenge participants' perceptions of their future academic prospects, changes in participants' mood states (agreeableness, unhappiness and irritability) between study conditions were used to assess the effectiveness of the academic ego-threat. Given that three comparisons were undertaken, a Bonferroni adjustment was made to control for Type 1 error yielding an acceptable significance level of $p<0.016$. Higher levels of irritability (Cohen's d= 0.81, t(71)= 6.87, $p<0.001$) and unhappiness (d= 0.89, t(71) =7.62, $p<0.001$) and lower levels of agreeableness (d= 0.49, t(71)= -4.14, $p<0.001$) were found following the ego-threat condition compared to the neutral condition, suggesting that the ego-threat had been effective.

*Counterbalancing effects*

Table 1 below presents the mean state mindfulness scores of participants categorised by condition and the order of presentation of the ego-threat and reading task articles.

INSERT

TABLE 1

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It may be seen that counterbalancing of conditions was only partially achieved (44 participants received the ego-threat condition first while 28 participants received it second). This imbalance occurred primarily due to more excluded participants being present in testing sessions where the neutral condition occurred before the ego-threat condition, in comparison to sessions where the ego-threat condition occurred before the neutral condition.

A mixed model ANOVA with one within-participant factor (condition: ego-threat and neutral) and two between-participant factors (condition order: ego-threat then neutral or vice versa; and article order: article A then article B or vice versa) was subsequently conducted to examine the effects of condition, condition order and article order presentation on state mindfulness scores. A significant main effect of condition [$F(1,68)=$ 40.94, $p<0.001$] was found. Participants experienced higher levels of momentary mindfulness in the neutral condition ($M = 19.02$) compared with the ego-threat condition ($M = 12.20$). Using Cohen's (1988) guidelines, the effect size was large (Cohen's $d=1.00$).

There was no significant main effect of condition order on average mindfulness levels [$F(1,68) = 0.05$, n.s.], showing that participants receiving the ego-threat before the first reading task did not differ overall on mindfulness levels from participants receiving the ego-threat before the second reading task. There was no significant main effect of article order on average mindfulness levels across the two conditions [$F(1,88)= 2.56$, n.s.] showing that participants receiving article A did not differ on overall mindfulness levels

from participants receiving article B. The two-way interactions between condition and condition order [$F(1, 68) = 1.83$, n.s.), condition and article order [$F(1,68) = 0.24$, n.s.] and condition order and article order [$F(1, 68) = 0.09$, n.s.], were non-significant. Likewise, the three-way interaction between condition, condition order and article order [$F(1,68)=0.01$, n.s.] was non-significant. The analysis shows that momentary mindfulness scores in each of the study conditions did not differ as a function of the presentation order of the ego-threat and reading task articles. The analysis therefore supports the appropriateness of treating threat-related changes in participants' mindfulness scores between neutral and ego-threat conditions as a single measure independently of condition order and article presentation order. So as to reflect the direction of the main effect of condition, this measure is referred to henceforth as threat-related reduction in mindfulness, corresponding to mindfulness levels in the neutral condition (as a baseline) minus mindfulness levels in the ego-threat condition.

Tests of association were subsequently conducted between threat-related reduction in mindfulness and academic contingent self-worth and demographic variables. As predicted, a significant positive association was found between threat-related reductions in mindfulness and academic contingent self-worth ($r=.32$, $p< 0.01$). Threat-related reductions in mindfulness were found to be unrelated to age (Spearman's rho $= -.22$, n.s.), gender ($t(70)=1.73$, n.s.) or ethnicity ($t(70)=1.64$, n.s.).

A regression analysis was subsequently carried out with academic contingent self-worth as the unique predictor variable and threat-related reductions in state mindfulness as the dependent variable. Academic contingent self-worth accounted for a significant amount

of variance in threat-related reductions in mindfulness ($R^2$= .10, adjusted $R^2$ = .09, ß=.32, p<0.01). With higher levels of the former predicting greater levels of the latter, the study's main hypothesis (H1) was supported.

*Test of mediating role of worry (H2)*

A test for the mediating role of worry between academic contingent self-worth and threat-related reductions in state mindfulness was undertaken using Baron and Kenny's (1986) 4-step methodology. Step 1 of the methodology was already established through the predictive relationship found between academic contingent self-worth and threat-related reductions in state mindfulness in the regression reported above. In relation to Step 2, academic contingent self-worth was entered as the predictor variable and worry entered as the dependent variable in a regression model. Academic contingent self-worth was found to account for a significant amount of variance in worry ($R^2$=.24, adjusted $R^2$=.23, $F_{(1,70)}$= 21.75, B=1.66, ß=.49, p<0.001) establishing Step 2. To test Step 3, academic contingent self-worth and worry were entered as predictor variables while threat-related reduction in state mindfulness was entered as the dependent variable in a multiple regression analysis. The two predictor variables accounted for a significant amount of variance in threat-related reduction in mindfulness ($R^2$=.15, adjusted $R^2$ = .13, $F_{(2,69)}$=6.09, p<0.01). The partial regression coefficients showed that worry made a significant contribution to threat-related reductions in mindfulness after controlling for academic contingent self-worth (B=.14, ß=.26, $t_{(69)}$=2.02, p<0.05) establishing Step 3 and partial mediation. With respect to Step 4, whilst the regression equation in Step 3 showed that academic contingent self-worth was not significantly associated with threat-

related reductions in mindfulness after controlling for worry, the standardised partial regression coefficient for academic contingent self-worth was not trivially small (B=.35, ß=.19, t(69)=1.50, n.s.) suggesting that complete mediation could not be inferred. A subsequent one-tailed *post hoc* Sobel test found the reduction of the effect of academic contingent self-worth on threat-related reductions in mindfulness due to controlling for worry (the indirect effect) to be significantly greater than zero (Sobel's statistic=1.86, p<0.05 (one-tailed)). The analysis therefore established statistical support for the mediating role of worry in the relationship between academic contingent self-worth and threat-related reduction in state mindfulness and thus supported the second study hypothesis (H2).

## 4. Discussion

The study found that levels of academic competence contingent self-worth predicted reductions in momentary mindfulness (from neutral levels) following an academic ego-threat. In other words, students whose self-worth was more contingent on academic performance and achievement showed greater reductions in state mindfulness when that contingency was threatened than students whose self-worth was less contingent on academic performance and achievement. These data are consistent with the theoretical proposal that external contingencies of self-worth act as inhibitory factors of mindfulness. As levels of academic contingent self-worth were not manipulated by the study it is not possible to directly infer that higher levels of academic contingent self-worth causally contributed to greater threat-related reductions in mindfulness. Nonetheless, the case for causality is made compelling by the finding that the academic ego-threat caused the

observed threat-related reductions in mindfulness and the likelihood that the impact of the academic ego-threat on participants was related to their degree of academic contingent self-worth. The findings accord with previous studies providing evidence of an association between external contingent self-worth and mindfulness (Brown & Ryan, 2003, Brown & Kasser, 2005). However, the present study provides more stringent support for a causal link between the two constructs.

The finding of statistical support for the mediating role of worry accords with Fennel's (1997) cognitive model of low self-esteem in which the activation of dysfunctional assumptions (such as firmly held self-worth contingencies) by uncertainty over whether the terms of the assumption will be met leads to anxious thinking. In addition, the finding is consistent with increases in anxious thinking leading to an increase in conceptually-driven processing and the observed reductions in mindfulness from neutral levels.

As a theoretical implication, the study provides support for the salience of self-investment in present-moment events as a controlling variable of momentary mindfulness. This is in accordance with the Buddhist account, outlined above, in which the conceptually-driven processing mode is primarily invested in evaluating events in relation to their impact on the self. This contrasts with the decentred processing mode where there is a registering and discerning of events without such self-invested evaluation.

From a clinical perspective, the study provides preliminary support for a complimentary avenue for enhancing mindfulness beyond the application of existing interventions used in current mindfulness-based treatments, namely the application of techniques to target clients' firmly held external self-worth contingencies. Such techniques might include interventions to modify dysfunctional assumptions, as utilised in cognitive therapy (Beck, 1976). Future studies could assess whether applying such techniques as an adjunct to existing mindfulness-based modalities leads to an incremental enhancement of therapeutic efficacy.

The study has a number of limitations. First, the findings were based on a specific external domain in a relatively homogeneous sample. Future research could examine the effect of alternative domain-specific external contingencies of self-worth (e.g., appearance) on mindfulness in both non-clinical and clinical populations, to establish whether the findings generalize to other populations and other external domains. Second, the use of trait worry as a proxy for momentary level worry did not provide for an optimal test of the proposed mediational model. A replication of the study using a pre-validated measure of momentary-level worry instead of the trait measure used would provide further insight into a mediating role for worry. Third, the support for the salience of self-investment in present moment events on momentary mindfulness was obtained by inducing a negative self-relevant event, and the study did not examine whether the findings generalized to other more positive self-relevant events. According to the Buddhist account (e.g., Brazier, 2003), self-investment can be inferred when an individual reacts to an event with feelings of attachment, as well as with feelings of

aversion. This would suggest that positive events that promote significant feelings of attachment (for example, perceiving a desirable object and wanting to possess it) would also lead to reductions in momentary mindfulness from neutral levels. Therefore, future studies could further examine the link between self-investment and mindfulness by exposing participants to positive events designed to induce feelings of attachment and by measuring subsequent changes in momentary mindfulness from neutral levels.

A final limitation relates to the use of the state version of the MAAS to detect changes in the key dependent variable. The content validity of the MAAS has been criticised for its narrow conceptualisation of mindfulness in terms of attention to present-moment activity (Grossman, 2011). In contrast, Bergomi, Tschacher and Kupper (2013) recently identified at least eight other components of mindfulness that exist in the literature including non-judgement/acceptance of experiences, non-reactivity to experience and insightful understanding. While the state MAAS measure does not include these putative features of mindfulness, it nevertheless captures what many believe to be the one of the construct's key elements, namely attention to the present moment. As more comprehensive measures of state mindfulness emerge in future it may be possible to detect change in additional components of mindfulness in response to threats to self-worth contingencies.

In conclusion this study has provided support for the proposal that cognitive factors linking self-worth to external outcomes act as inhibitory factors of mindfulness. It is hoped that the study will contribute to scientific accounts of mindfulness by providing preliminary support for an additional distinction between the conceptually-driven and

decentred processing modes determined by the respective primacy or absence of the evaluation of events in relation to their impact on the self.

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Table 1

Means and Standard Deviations of State Mindfulness Scores by Condition, Condition Order and Article Order. Numbers of participants in each cell are presented in parentheses.

| Condition | Condition order | Article Order Presentation | |
|---|---|---|---|
| | | Article A first | Article B first |
| Ego-threat | 1st | 10.00, SD=6.28, (N=22) | 13.18, SD=9.58, (N=22) |
| | 2nd | 13.80, SD=8.27, (N=15) | 11.62, SD=7.30, (N=13) |
| Neutral | 1st | 18.72, SD=4.95, (N=22) | 20.68, SD=5.45, (N=22) |
| | 2nd | 18.66, SD=7.20, (N=15) | 18.03, SD=7.02, (N=13) |