Brief mindfulness induction could reduce aggression after depletion

Cleoputri Yusainy\textsuperscript{a,\ast}, Claire Lawrence\textsuperscript{b}

\textsuperscript{a}Psychology Programme, Faculty of Social and Political Sciences, Brawijaya University, Malang, Indonesia
\textsuperscript{b}Personality, Social Psychology, and Health (PSPH) Group, School of Psychology, University of Nottingham, Nottingham NG7 2RD, UK

\begin{abstract}
Many experiments have shown that one's ability to refrain from acting on aggressive impulses is likely to decrease following a prior act of self-control. This temporary state of self-control failure is known as ego-depletion. Although mindfulness is increasingly used to treat and manage aggressive behaviour, the extent to which mindfulness may counteract the depletion effect on aggression is yet to be determined. This study (\textit{N} = 110) investigated the effect of a laboratory induced one-time mindfulness meditation session on aggression following depletion. Aggression was assessed by the intensity of aversive noise blast participants delivered to an opponent on a computerised task. Depleted participants who received mindfulness induction behaved less aggressively than depleted participants with no mindfulness induction. Mindfulness also improved performance on a second measure of self-control (i.e., handgrip perseverance); however, this effect was independent of depletion condition. Motivational factors may help explain the dynamics of mindfulness, self-control, and aggression.
\end{abstract}

\section{Introduction}

\textit{1. Mindfulness, self-control ego-depletion, and aggression}

"Whose mind stands like a mountain. Steady, it is not perturbed. Unattached to things that arouse attachment. Unangered by things that provoke anger. When his mind is cultivated thus. How can suffering come to him?" (\textit{Udana} 4.4, in \textit{Anonymous}, 2012). At any given moment, the contents of one's thoughts and emotions may be painful, pleasant, or neutral. Mindfulness — translated from the Pali (the language in which early Buddhist teaching was recorded) word, \textit{sati} ("memory") — is a practice that acknowledges the contents of consciousness as states that arise and pass, but do not necessarily need action (\textit{Bodhi}, 2000; \textit{Sujiva}, 2000). The result of this practice is a mental gap between consciousness and its contents, or between attention and its objects (\textit{Baer}, 2003; \textit{Brown, Ryan, & Creswell}, 2007\textit{a,b}; \textit{Shapiro, Carlson, Astin, & Freedman}, 2006). Central for the present study is the idea that mindfulness may reduce an individual's reactivity that is typically associated with aggression-triggering events.

The current literature has documented the application of mindfulness-based interventions for treatment of aggression in mental health and forensic settings (see \textit{Fix & Fix}, 2013; \textit{Shonin, Gordon, Slade, & Griffiths}, 2013). However, much less aggression research has been conducted on the effect of brief mindfulness induction as opposed to the context of extensive.
training in mindfulness. Preliminary support for the benefit of laboratory inductions of mindfulness on provoked aggression has been provided by Heppner et al. (2008). In their study, participants were randomly assigned to one of three conditions in a social rejection task: acceptance from partner, rejection by partner, or rejection plus mindfulness (i.e., a 5-min task of eating raisins while being focused in a mindful way on the experience of eating the raisin). In a subsequent aggression task using the administration of aversive noise blasts as the aggressive behaviour, those in the rejection plus mindfulness condition behaved less aggressively than those in the rejection only condition, and their behaviour did not differ from those in the non-rejection condition. We expand on this method by looking at prior self-control behaviour rather than social rejection as a possible precursor to aggression.

The importance of trait self-control on the link between mindfulness and aggression has been reported in a recent correlational study (Yusainy & Lawrence, 2014). Even though trait self-control appears to be a highly desirable quality, a momentary act of self-control may be costly. As suggested in “test-operate-test-exit” theory (TOTE, see Carver & Scheier, 1982), effective self-control requires a continuous monitoring of the self’s current state against some desirable goals or standards. Once a person has detected a discrepancy between current and desired states, some operations to change the self can be initiated. Much like a muscle, however, these operations are proposed to rely on the availability of a common and limited pool of ‘resources’, or self-control strength (Baumeister, Vohs, & Tice, 2007). After performing initial acts requiring self-control, the capacity for further control, even on unrelated self-control tasks, is temporarily decreased (i.e., ‘ego-depletion’: a meta-analysis of this model is provided in Hagger, Wood, Chris, & Chatzisarantis, 2010).

Experimental research has shown that compared to non ego-depleted participants, depleted participants (who had previously resisted eating tempting food or stifled physical and emotional reactions) delivered more negative ratings to an experimenter that had previously insulted them (Stucke & Baumeister, 2006; see also DeWall, Baumeister, Stillman, & Gailliot, 2007). Participants also behaved more aggressively toward intimate partners had who ostensibly provoked them with negative feedback than when they were depleted than when they were not (Finkel, DeWall, Sloter, Oaten, & Foshee, 2009). These studies conclude that under depletion conditions, subsequent attempts at controlling aggressive impulses become more prone to failure. Aggression is, arguably, a prime example of self-control failure.

Unlike self-controlled attention, which encompasses both monitoring and controlling the self in order to achieve some future goals, mindfulness serves solely to monitor the contents of consciousness (Brown et al., 2007a,b). It has been demonstrated elsewhere that the neural system that monitors the mismatches between current and desired states (ERN: error-related negativity) is weakened after performing an initial self-control act (Inzlicht & Gutsell, 2007). As individuals who are mindful make no direct attempts to modify their experiences associated with being depleted, they become better attuned to when self-control is at stake (Teper, Segal, & Inzlicht, 2013). Indeed, greater self-control in terms of increased ERN and heightened emotional acceptance has been reported in experienced mindfulness meditators (Teper & Inzlicht, 2013). Of particular relevance is Friese, Messner, and Schaffner’s (2012) experiment with participants of a 3-day introductory seminar on mindfulness meditation. They showed that participants who had engaged in a 5-min period of mindfulness meditation after an emotion suppression task performed better on a subsequent self-control task (i.e., the crossing-out-letters task to discriminate between adjacent and similarly looking, but slightly different letters) than those in the suppression-only condition, and performed equally well as those not suppressing emotion (where participants were asked simply to watch the same movie clip). In the same way, mindfulness may act as a counteracting variable for the effect of depletion on aggression.

It should be noted, however, that many measures of self-control exist, and many do not correlate highly (see Duckworth & Kern, 2011). While resisting aggressive impulses requires self-control, the direct effect of depletion on aggression, and the effect of mindfulness on post-depletion aggression may not be observed in other self-control tasks. To test this possibility, a frequently used behavioural measure of self-control (i.e., handgrip perseverance: Hagger et al., 2010) is included as a second dependent variable. As a whole, therefore, the current study examines the moderating effect of mindfulness induction on the link between ego-depletion and two consecutive self-control measures: one in the domain of aggression and one in the domain of physical stamina. In this way, we will be able to investigate whether the effects of brief mindfulness induction are consistent across different tasks of self-control.

1.2. The current study

In the current study, aggression is provoked using Lawrence and Hutchinson’s (2013, 2014) adapted version of the Taylor Competitive Reaction Time (TCRT: Taylor, 1967) task. In typical work using the TCRT task, participants play a computer-based competitive reaction-time task against a bogus opponent, where the winner of each trial is given opportunity to deliver a noise blast/electric shock to the loser (see Giancola & Parrott, 2008). Following Lawrence and Hutchinson (2013, 2014), we (i) use participants’ intensity of noise blasts delivered to the bogus opponent as a measure of direct aggression, (ii) provide a non-aggressive response option, and (iii) vary the levels of provocation from the opponent (i.e., noise blast intensity delivered to participant by the bogus opponent) such that participants are exposed to no provocation, low/moderate provocation, and high provocation trials.

We expect that the main effect of depletion on aggression, and the moderation of mindfulness on the depletion-aggression link would be strongest under conditions of a moderate degree of provocation (i.e., low provocation trial in the current TCRT task). The logic behind this prediction follows the logic of person x situation models. In the Traits as Situational Sensitivities model (TASS: Marshall & Brown, 2006), the person-based predictors of aggression are proposed to function in a threshold-like manner to situation-based predictors of aggression. For example, a person who is high in trait aggression
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