Maladaptive Perfectionism's Link to Aggression and Self-Harm:

Emotion Regulation as a Mechanism

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Abstract

The negative affect that results from negative feedback is a substantial, proximal cause of aggression. People high in maladaptive perfectionism, the tendency to focus on the discrepancy between one's standards and performance, are characterized by an exaggerated negative affective response to negative feedback. This exacerbated affective response to failure may then dispose them to hurt others and themselves as aggression and self-harm are often perceived as a means to regulate negative affect. In Study 1, we demonstrated that maladaptive perfectionism was linked to greater aggressive behavior towards others after receiving negative feedback. Suggesting the presence of an emotion regulation strategy, this effect was mediated by the motivation to use aggression to improve mood. In Study 2, maladaptive perfectionism was linked to self-harm, an effect exacerbated by negative feedback and mediated by negative affect. These findings suggest that maladaptive perfectionists are at risk for greater harm towards others and the self because negative feedback has a stronger affective impact and harming others and the self is perceived a means to alleviate this aversive state.

Keywords: maladaptive perfectionism, aggression, mood improvement, emotion regulation

Introduction

Perfectionism is not a quest for the best. It is a pursuit for the worst in ourselves.

-Julia Cameron

Aggression, the act of harming others against their will, is often a costly consequence of humans' psychological architecture (Anderson & Bushman, 2002). This behavior is quite often due to a lack of appropriate self-control or self-regulation (Denson, Capper, Oaten, Friese, & Schofield, 2011; DeWall, Baumeister, Stillman, & Gailliot, 2007; DeWall, Finkel, & Denson, 2011). However, it remains unknown whether individuals who tend to excessively self-regulate may be at risk for aggression and what might mediate this effect. Maladaptive perfectionism, an excessive focus on the perceived discrepancy between one's standards and actual performance (Rice, Ashby, & Slaney, 2007), may be just such an example in which a particular form of self-regulation translates into aggression. This excessive regulatory emphasis on meeting goals may exacerbate the negative affect that arises from failure, which in turn could increase aggression towards others and the self as these behaviors are often reinforcing and perceived as a viable way to improve mood (Bushman, Baumeister, & Phillips, 200; Nock, 2009).

To date, no research has examined these possibilities. We sought to fill this gap in the literature in two studies. In each study, participants completed a measure of maladaptive perfectionism. Next, some participants experienced negative feedback that would cause them to focus on a discrepancy between their own standards and their actual performance. Finally, we gave participants an opportunity to behave aggressively

toward others (Study 1) or themselves (Study 2). Variables related to emotion regulation were also included in each study.

Perfectionism: Adaptive versus Maladaptive

Perfectionism is a multidimensional trait that includes both adaptive and maladaptive components (Dunkley, Blankstein, Masheb, & Grilo, 2006; Frost, Marten, Lahart, & Rosenblate, 1990; Hewitt, Flett, Besser, Sherry, & McGee, 2002; Stairs, Smith, Zapolski, Combs, & Settles, 2012). In its adaptive form, perfectionism engenders high standards of performance and motivates individuals to reach those goals (Klibert Langhinrichsen-Rohling, & Saito, 2005; Mills & Blankenstein, 2000). However, perfectionism's motivation towards meeting high standards becomes maladaptive when individuals focus on the *discrepancy* between these goals and their actual performance (Rice et al., 2007; Slaney, Rice, & Ashby, 2002; Suddarth & Slaney, 2001; Wei, Mallinckrodt, Russell, & Abraham, 2004). Such maladaptive perfectionism has been linked to many negative outcomes and psychopathologies including depression (Rice & Dellwo, 2001), disordered eating (Vohs, Bardone, Joiner, Abramson, & Heatherton, 1999; Vohs et al., 2001), social anxiety (Saboonchi, Lundh, & Ost, 1999), and many others. Yet why might maladaptive perfectionism be potentially linked to greater aggression?

Maladaptive Perfectionism and Aggression

Some of the first evidence that maladaptive perfectionism might be linked to aggressive behavior came from studies into the personality correlates of perfectionism. Several studies linked maladaptive perfectionism to greater levels of trait anger and trait hostility (Frost et al., 1990; Hewitt & Flett, 1991; Saboonchi & Lundh, 2003). Anger and

hostility comprise two of the core features of aggressive personality (Buss & Perry, 1982). More recent research has replicated these associations between maladaptive perfectionism and anger/hostility and further contributed a positive correlation with aggressive personality traits (Öngen, 2009). Trait aggression is robustly linked to aggressive behavior (e.g., Buss & Perry, 1982). Thus, there is good reason to expect a positive association between aggressive behavior towards others and maladaptive perfectionism. But why might maladaptive perfectionism be linked to such behavior?

Perhaps the most venerable finding in the corpus of aggression research is that aggression often arises due to the negative affect which follows an unmet goal (i.e., the frustration-aggression hypothesis; Berkowitz, 1989; Dollard, Miller, Doob, Mowrer, & Sears, 1939). More recent models have retained and built upon this finding that failed goal-striving elicits aggression through negative affect (i.e., the general aggression model; Anderson & Bushman, 2002). Due to their excessive fixation on the discrepancy between goals and performance (Slaney et al., 2002), maladaptive perfectionists are likely to experience an exacerbated affective response to failure which may then dispose them towards aggression. Indeed, maladaptive perfectionism is associated with greater negative affect (e.g., anger, sadness, shame) in response to failures (Besser, Flett, & Hewitt, 2004; Dunn, Gotwals, Causgrove-Dunn, & Syrotuik, 2006; Fedewa, Burns, & Gomes, 2005; Stoeber, Harris, & Moon, 2007). As suggested by prominent models of aggression, this greater negative affect is likely place maladaptive perfectionists at greater risk for aggression. Yet recent research has suggested that this negative affect may predict aggression in only an indirect manner.

Aggression as Emotion Regulation

Emotions evolved to guide behavior and often serve as a feedback mechanism through which we learn, often unconsciously, if a given action was adaptive (i.e., followed by positive affect) or maladaptive (i.e., followed by negative affect; Baumeister, Vohs, DeWall, & Zhang, 2007). Reflecting this function of emotion, human behavior is often driven by how individuals *anticipate* they will feel because of the action (Baumeister et al., 2007; DeWall, Baumeister, Chester, & Bushman, in press). Aggression is often motivated by the expectation that it will improve one's mood (Bushman, 2002; Bushman et al., 2001; Bushman, Baumeister, & Stack, 1999). It follows that those who experience a worse mood will go to greater lengths to seek to improve it. Maladaptive perfectionists, by virtue of their greater affective response to negative feedback, might show a motivation to aggress based on the anticipation that it will repair their aversive affective state. It may be that this motivation to harm others extends to the self as well.

Maladaptive Perfectionism and Self-Harm

Maladaptive perfectionism is predictive of a variety of forms of self-harm, which include disorder eating (Bastiani, Rao, Weltzin, & Kaye, 1995; Vohs et al., 1999, 2001), non-suicidal self-injury (e.g., cutting; Yates, Tracy, & Luther, 2008), and suicide (O'Connor, 2007). Such self-harm is often used to regulate negative affect as doing so is often reinforcing and distracts from the negative affect itself (Nock, 2009). Because maladaptive perfectionists experience negative feedback as more distressing and aversive (e.g., Fedewa et al., 2005), they should be more prone towards self-harm to ameliorate this affective state.

Present Research

To assess the potential links between maladaptive perfectionism and aggression towards others and the self, we conducted two experiments. Study 1 sought to test the hypothesis that maladaptive, and not adaptive, perfectionism would be linked to greater aggression towards others after negative feedback. Further, Study 1 included a measure of the motivation to use aggression to improve mood to assess whether the link between maladaptive perfectionism and aggression was mediated through increases in such motivation. To assess whether these emotion regulation motives extended to aggressive personality as well, Study 1 included a measure of trait aggression. Study 2 sought to extend these findings to the domain of aggression towards the self (i.e., self-harm), specifically hypothesizing that maladaptive, and not adaptive, perfectionism would be associated with greater aggression towards the self after an experimental induction of negative feedback. Study 2 also included a measure of negative affect after the negative feedback to assess whether changes in mood explain subsequent self-harm.

Study 1

Study 1 was designed to assess whether, after negative feedback, (A) maladaptive perfectionism is linked to greater aggressive behavior towards others, (B) this is due to emotion regulation motives, and (C) whether these effects extend to trait aggression. To fulfill these aims, Study 1 included a measure of adaptive and maladaptive perfectionism, an experimental induction of negative feedback, and then a measure of aggression toward the individual who provided the negative feedback. We included a state-level measure of the tendency to use aggression to improve mood

which we expected would mediate the effect of maladaptive perfectionism on aggressive behavior and personality. Finally, we included a measure of trait aggression.

Method

Participants

Participants were 155 undergraduates (82% female; Age: $M = 18.83$, $SD = 1.03$) who were compensated with course credit.

Materials

Almost Perfect Scale - Revised. The APS-R is a reliable, valid, and widely-used measure of both adaptive and maladaptive perfectionism (Slaney, Mobley, Trippi, Ashby, & Johnson, 1996; Slaney, Rice, Mobley, Trippi, & Ashby, 2001). This 23-item measure contains three subscales that assess the tendency to have high standards (i.e., Standards subscale; seven items; sample item: "I have high standards for my performance at work or at school"), to need order and structure (i.e., Order subscale; four items; sample item: "I am an orderly person"), and to perceive oneself as failing to meet the high standards one sets for oneself (i.e., Discrepancy subscale; 12 items; sample item: "I often feel frustrated because I can't meet my goals"). The Discrepancy subscale indexes maladaptive perfectionism whereas the other two facets index adaptive perfectionism. Participants rate their agreement with each statement along a 1 (strongly disagree) to 7 (strongly agree) response scale. Each participant receives a score for each of the three subscales by averaging across each of their responses on that given subscale. Scores can range from 1 (low) to 7 (high). There are no specific cutoffs that delineate categorical differences on this measure.

Angry Mood Improvement Inventory. The Angry Mood Improvement Inventory (AMII) was adapted by Bushman and colleagues (2001) to assess the degree to which individuals tend to control and express anger behaviorally *as motivated by a desire to improve mood*. The AMII contains an eight-item subscale of particular relevance to our mood improvement hypothesis, the Anger Expression – Out subscale. This subscale assesses the tendency to express angry mood outwardly as aggressive behavior. Each item refers to a behavior that participants rate along a five-point scale which indicates the degree to which they would like to perform a given behavior (e.g., strike out at whatever angers me) *to try and feel better* when they are angry or furious. Each participant receives a score by averaging across each of their eight responses. Scores can range from 1 (low) to 5 (high). There are no specific cutoffs that delineate categorical differences on this measure. The AMII possesses excellent levels of both internal reliability within each subscale and test-retest reliability (Bushman et al., 2001; Bushman & Whitaker, 2010).

Brief Aggression Questionnaire. The 12-item Brief Aggression Questionnaire (BAQ) is a short-form of the most commonly-used trait aggression measure, the 29-item Buss-Perry (1982) Aggression Questionnaire (Webster et al., 2013). The BAQ maintains fidelity with the four factor structure of the original questionnaire with a 3-item subscale measuring each construct: anger (sample item: sometimes I fly off the handle for no good reason), hostility (sample item: when people are especially nice, I wonder what they want), physical aggression (sample item: given enough provocation, I may hit another person), and verbal aggression (sample item: when people annoy me, I may tell them what I think of them). Participants rate their agreement with each statement along

a 1 (strongly disagree) to 7 (strongly agree) response scale. Each participant receives a

score for each of the four subscales by averaging across each of their three responses.

Scores can range from 1 (low) to 7 (high). There are no specific cutoffs that delineate

categorical differences on this measure. The BAQ also exhibits excellent convergent

validity, discriminant validity, internal reliability, and test-retest reliability (Webster et al.,

2013).

　　　　Aggression paradigm. Participants completed the Taylor Aggression Paradigm

(TAP), a well-validated measure of behavioral aggression framed as a competitive

reaction time game played over the internet with a fictitious opponent (Anderson &

Bushman, 1997; Giancola & Chermack, 1998; Taylor, 1967). For each of the 25 trials of

the task, participants set the volume (60 – 105 decibels) and duration (0 – 5 seconds) of

an aversive noise blast that their opponent ostensibly heard if participants won the

competition (i.e., press a button faster). A non-aggression option was also provided if

participants wanted to refrain from aggression. If participants lost the trial, they were

blasted with noise that their opponent ostensibly determined ahead of time. Wins and

losses were randomly determined with the exception of the first trial, which all

participants lost. Although this measure may appear as a trivial computer game, it has

been shown to function similarly to aggression in the 'real world' and to possess

excellent construct and predictive validity (Anderson & Bushman, 1997; Giancola &

Chermack, 1998).

Procedure

　　　　All research procedures were approved by the University of Kentucky's

Institutional Review Board. Participants arrived at our laboratory where they gave

informed consent and then completed a computerized battery of personality questionnaires which included the APS-R, AMII, and the BAQ. In order to induce negative feedback, we utilized a validated provocation paradigm from previous research on aggression (Bushman & Baumeister, 1998; DeWall, Lambert, Pond, Kashdan, & Fincham, 2011). Participants hand-wrote a short essay about a time in which they were 'very angry' for 5 minutes. Participants then exchanged their essay with a fictitious same-gender undergraduate for the purpose of evaluating each other's writing abilities. Next, participants received their essay evaluation, which contained negative numerical ratings (6 out of 35 points) and an insulting comment, "One of the worst essays I've ever read!" Finally, participants completed the noise blast paradigm against the essay evaluator.

Results

Psychometrics

Five participants failed to complete the aggression measure due to time constraints, noise volume and duration levels also had high internal reliabilities, $\alpha = .97$ and $\alpha = .97$, respectively, and were significantly correlated, $r(148) = .95$, $p < .001$. Thus, we standardized and averaged intensity and duration levels across all 25 trials to create a more reliable retaliatory aggression index. Descriptive statistics and reliability estimates for each measure are provided in Table 1.

Table 1. Descriptive statistics for each measure in Study 1.

Measure	M	SD	α	Possible Range	Observed Range
AMII	2.22	0.54	.76	1.00-5.00	1.00-3.75

APS - Discrepancy	3.77	1.31	.93	1.00-7.00	1.00-7.00
APS - Order	5.35	1.31	.88	1.00-7.00	2.00-7.00
APS - Standards	6.24	0.86	.87	1.00-7.00	3.00-7.00
BAQ - Anger	2.46	1.08	.55	1.00-7.00	1.00-7.00
BAQ - Hostility	3.04	1.40	.76	1.00-7.00	1.00-7.00
BAQ - Physical	2.94	1.71	.82	1.00-7.00	1.00-7.00
BAQ - Verbal	3.88	1.52	.79	1.00-7.00	1.00-7.00
TAP	-0.10	0.68	.98	infinite	-1.41-1.59

Associations with Aggressive Behavior

To assess the ability of maladaptive perfectionism to predict aggressive behavior and personality, above-and-beyond the other facets of perfectionism (i.e., high standards, order), we performed multiple regression analyses that simultaneously included each of the three facets of perfectionism as regressors. Zero-order correlations between each construct are provided in Table 2. After controlling for the effects of Order, $\beta = .08$, $t(146) = 0.08$, $p = .938$, and Standards, $\beta = -.04$, $t(146) = -0.38$, $p = .706$, subscales of the APS-R, Discrepancy scores were positively associated with aggression across all 25 trials of the noise blast paradigm, $\beta = .21$, $t(146) = 2.59$, $p = .011$, $\Delta R^2 = .04$. After controlling for the effects of Order, $\beta = -.06$, $t(151) = -0.62$, $p = .534$, and Standards, $\beta = .05$, $t(151) = 0.49$, $p = .629$, subscales of the APS-R, Discrepancy scores were positively associated with Anger Expression - Out subscale of the AMII, $\beta = .26$, $t(151) = 3.27$, $p = .001$, $\Delta R^2 = .07$.

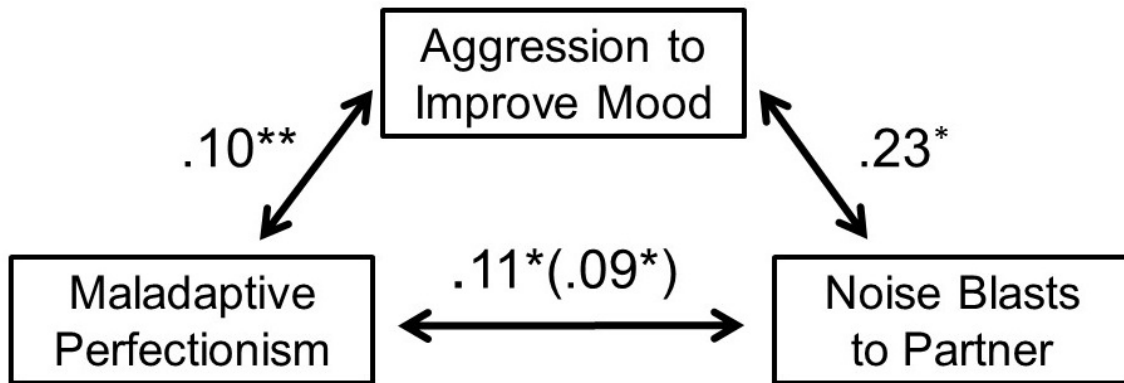**Table 2. Zero-order correlations between each measure from Study 1.**

	1	2	3	4	5	6	7	8

1. APS - Discrepancy								
2. APS - Order	.01							
3. APS - Standards	.13	.53***						
4. TAP	.21*	-.01	-.01					
5. AMII	.27**	-.03	.05	.22**				
6. BAQ - Anger	.26**	-.06	-.06	.18*	.59***			
7. BAQ - Hostility	.45***	-.25**	-.14†	.21*	.35***	.31***		
8. BAQ - Physical	.25**	.01	.14†	.18*	.54***	.38***	.29***	
9. BAQ - Verbal	.11	-.02	.18*	.12	.56***	.34***	.30***	.54***

†*p* < .10, **p* < .05, ***p* < .01, ****p* < .001

Anger Expression - Out scores on the AMII were positively associated with aggression across all 25 trials of the aggression paradigm, $r(148) = .22$, $p = .007$. Mediation analyses (using 1,000 bias-corrected bootstrap samples; Preacher & Hayes, 2008) showed that, controlling for the Order and Standards subscales of the APS-R, the Discrepancy subscale demonstrated an indirect effect on the aggressive behavior observed across all 25 trials of the aggression measure through the Anger Expression - Out subscale of the AMII (95% confidence interval: .003, .070; Figure 1).

Figure 1. Bootstrapped mediation model whereby a greater tendency to act aggressively to improve mood mediated the positive association between maladaptive perfectionism and aggressive behavior. Values represent unstandardized regression coefficients. *p < .05, **p < .01.

Associations with Aggressive Personality

Maladaptive perfectionism, controlling for the order and standards facets of perfectionism, was significantly associated with greater trait levels of anger, hostility, and physical aggression, and marginally associated with greater verbal aggression (see Table 3).

Table 3. Partial standardized regression coefficients of each of the three APS-R subscales and each of the four facets of trait aggression as measured by the BAQ.

	Anger	Hostility	Physical Aggression	Verbal Aggression
Discrepancy	.27**	.46***	.24**	.08
Order	-.02	-.21*	-.07	-.15
Standards	-.08	-.09	.15	.25*

†$p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$

The motivation to aggress to improve mood significantly mediated the effect of maladaptive perfectionism on each facet of trait aggression, controlling for the order and standards facets of perfectionism (see Table 4).

Table 4. Unstandardized regression coefficients representing the effect of maladaptive perfectionism on the motivation to use aggression to improve mood (a), the effect of the motivation to use aggression to improve mood on each facet of trait aggression (b), direct effect of maladaptive perfectionism on each facet of trait aggression (c), and the direct effect after controlling for the indirect effect (c'), all while controlling for the order and standards facets of perfectionism. The C.I. column represents the bias-corrected, bootstrapped (1,000 samples) 95% confidence interval of the indirect effect.

	a	b	c	c'	95% C.I.
Anger	.11**	1.12***	.23***	.11†	.032, .235
Hostility	.11**	0.62***	.49***	.43***	.017, .142
Physical Aggression	.11**	1.59***	.31**	.14	.063, .335
Verbal Aggression	.11**	1.58***	.09	-.08	.062, .317

$^{†}p < .10$, $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$

Discussion

Study 1 demonstrated that maladaptive perfectionism was indeed associated with more aggressive behavior after negative feedback, above-and-beyond adaptive facets of perfectionism. Supporting our emotion regulation account, this effect was mediated by the motivation to use aggression to improve mood. Thus, it appears that aggression may be perceived among maladaptive perfectionists as an effective means

through which to improve mood. However, it remains unknown whether aggression actually achieves this aim of improved mood. Replicating previous research (Öngen, 2009), we showed that maladaptive perfectionism was linked to trait anger, hostility, and physical aggression and not verbal aggression. Instead, the high standards facet of adaptive perfectionism was associated with greater verbal aggression. Further research is needed to understand why verbal aggression seems to deviate from other forms of aggressive personality as it relates to perfectionism. Lending further support to our emotion regulation account, we showed that each of these effects, even the null association with verbal aggression, was mediated by the motivation to use aggression to improve mood. Thus, this reinforcing pursuit of better mood through aggression may contribute to durable and dispositional aggressiveness.

These findings provide additional evidence that maladaptive perfectionism is a risk factor for aggressive behavior that is motivated by emotion regulation concerns. We next sought to extend these findings to the domain of aggression towards the self (i.e., self-harm) in Study 2. Further, Study 1 did not include a control condition in which positive feedback was given. We attempted to rectify this limitation in Study 2 by providing such a control condition.

Study 2

Study 2 was designed to test the hypothesis that after experiencing negative feedback, but not positive feedback, maladaptive perfectionism, and not adaptive, would be associated with greater aggression towards the self. To examine this prediction, participants reported their levels of adaptive and maladaptive perfectionism, received negative or positive feedback, and then were given an opportunity to express their

aggressive inclinations toward the self. Due to ethical considerations, we were not able to use an actual measure of self-harm. Instead, we adapted a burgeoning aggression measure—the voodoo doll task (VDT: DeWall et al., 2013)—that uses a symbolic target of harm, in this case a symbolic self. Specifically, participants placed virtual pins in a doll that represented themselves. Prior research has shown that the number of pins inserted into the doll correlates positively with aggressive personality and actual aggressive and violent behavior (DeWall et al., 2013).

We did not include the angry mood improvement index in this study because it typically applies to outwardly aggressive acts, not the inward, self-harming behavior to which our hypothesis pertained. We did however seek to test whether negative mood mediated the effect of maladaptive perfectionism on self-harm to implicate the greater affective reactivity that maladaptive perfectionists experience.

Method

Participants

Participants were 88 undergraduates (75% female; Age: M = 19.10, SD = 1.21) who were compensated with course credit.

Materials

Almost Perfect Scale - Revised. The 23-item APS-R measure, as administered in Study 1, was also administered in Study 2.

Positive Affect Negative Affect Schedule. The PANAS is a validated measure through which to assess transient levels of positive and negative affect (i.e., mood; Watson, Clark, & Tellegen, 1988). This 20-item measure contains two, 10-item subscales that assess negative and positive affect. To measure these constructs,

participants rate how much they agree with the statement that they are currently

experiencing a given feeling (negative sample items: ashamed, upset; positive sample

items: excited, proud) along a 1 (strongly disagree) to 7 (strongly agree) response

scale. Each participant receives a score for each of the two subscales by averaging

across each of their responses on that given subscale. Scores can range from 1 (low) to

7 (high). There are no specific cutoffs that delineate categorical differences on this

measure.

     Voodoo doll task. A relatively novel task to flexibly measure aggressive

behavior in both the laboratory and via the internet is the voodoo doll task (DeWall et

al., 2013). Capitalizing on the human tendency to bestow certain objects with magical

properties (Rozin, Millman, & Nemeroff, 1986), the voodoo doll task asks individuals to

imbue an inanimate doll with features of actual individuals (e.g., friendships, romantic

relationship partners; DeWall et al., 2013). Then, participants are given the option to

stab 0 to 51 pins in the doll, a form of aggression. This task has shown excellent

reliability over time, corresponds to other measures of aggression (e.g., trait aggression

measures, noise blasts directed at a friends and romantic relationship partners), exhibits

appropriate responsiveness to laboratory provocation inductions, and tends not to vary

whether the task is administered in the laboratory or over the internet (Bushman,

DeWall, Pond, & Hanus, 2014; DeWall et al., 2013). Typically, the doll in this task

represents another person. In our study, we used a novel adaptation of the task in

which the doll represented the self. Given previous research showing that people readily

imbue inanimate dolls with the features of people (DeWall et al., 2013) and that people

readily express their selves through inanimate objects (Gosling, Ko, Mannarelli, &

Morris, 2002), there is good reason to expect that a self-oriented version of the voodoo doll task would be an effective measure of self-directed aggression.

Procedure

Participants completed this experiment over the internet that was ostensibly testing how well individuals were able to write about events that they had to mentally visualize. Participants began by completing a battery of personality questionnaires that included the APS-R (Slaney et al., 2001). To manipulate whether participants received negative or positive feedback, we adapted the provocation paradigm used in Study 1 (Bushman & Baumeister, 1998; DeWall et al., 2011). Participants wrote an essay (800 character minimum) about a time they were very angry which they were told would be exchanged over the internet with a same-sex undergraduate completing the same study. After a 25 second loading screen, participants viewed a pre-written essay which participants evaluated along 5 criteria (e.g., creativity) along a 7-point scale and were given an option to write comments on the essay. After a 17 second loading screen, participants viewed two bar graphs that showed their scores across all 5 dimensions and their overall score. Participants were randomly assigned to receive either negative (10/35 points) or positive (30/35 points) feedback. Below each bar graph was a comment from participants' fake partner which either stated 'one of the worst essays that I have EVER read!' (negative feedback condition) or 'great essay!' (positive feedback condition).

To confirm our manipulation impacted our participants, they then rated their current mood using the PANAS (Watson et al., 1988). Afterwards, participants were presented with the voodoo doll task. In this task, the doll was intended to represent the

participant and they were instructed to 'choose how many needles (up to 51) you would like to put in the doll that represents *you* to punish you for your performance on the previous essay task.' Participants viewed an image of the doll and a series of images that showed what the doll looked like with 0 to 19 pins placed into it. Participants then used a slider that extended from 0 to 51 to indicate the number of pins they placed in their doll.

Results

Psychometrics and Manipulation Checks

Suggesting the efficacy of our negative feedback manipulation, participants who received negative feedback reported greater negative affect, $M = 3.58$, $SD = 1.22$, $t(87) = 3.17$, $p = .002$, $d = 0.53$, and lesser positive affect, $M = 3.34$, $SD = 1.29$, $t(87) = -2.47$, $p = .015$, $d = -0.68$ than those who received positive feedback (negative affect: $M = 2.89$, $SD = 1.37$; positive affect: $M = 4.26$, $SD = 1.40$). As multidimensional models of perfectionism would predict, maladaptive perfectionism (controlling for Standards and Order) was associated with greater negative affect resulting from both negative, $\beta = .39$, $t(40) = 2.63$, $p = .012$, and positive forms of feedback, $\beta = .36$, $t(40) = 2.31$, $p = .026$. Descriptive statistics and reliability estimates for each measure are provided in Table 5.

Table 5. Descriptive statistics for each measure in Study 2.

Measure	*M*	*SD*	α	Possible Range	Observed Range
APS - Discrepancy	4.12	1.42	.95	1.00-7.00	1.42-7.00
APS - Order	5.30	1.18	.91	1.00-7.00	1.25-7.00
APS - Standards	5.93	0.80	.88	1.00-7.00	4.00-7.00

PANAS - Negative	3.23	1.34	.93	1.00-7.00	1.00-6.60
PANAS - Positive	3.80	1.41	.95	1.00-7.00	1.00-7.00
VDT	9.24	12.94	n/a	0.00-51.00	0.00-51.00

Poisson Moderation Analyses

As expected, a Kolmogorov-Smirnov test revealed that the distribution of number of pins did not meet the assumption of normality, $k(87) = .28$, $p < .001$. Subsequently, a Poisson loglinear distribution was adopted for subsequent analyses using generalized mixed linear modeling (as recommended by DeWall et al., 2013). To assess the ability of maladaptive perfectionism to predict self-aggressive behavior, above-and-beyond the other facets of perfectionism (i.e., high standards, order), we performed multiple Poisson regression analyses that simultaneously included each of the three facets of perfectionism as regressors. Zero-order correlations between each construct are provided in Table 6.

Table 6. Zero-order correlations between each measure from Study 2. Parenthesized values represent the correlations for the positive feedback group on the left and the negative feedback group on the right.
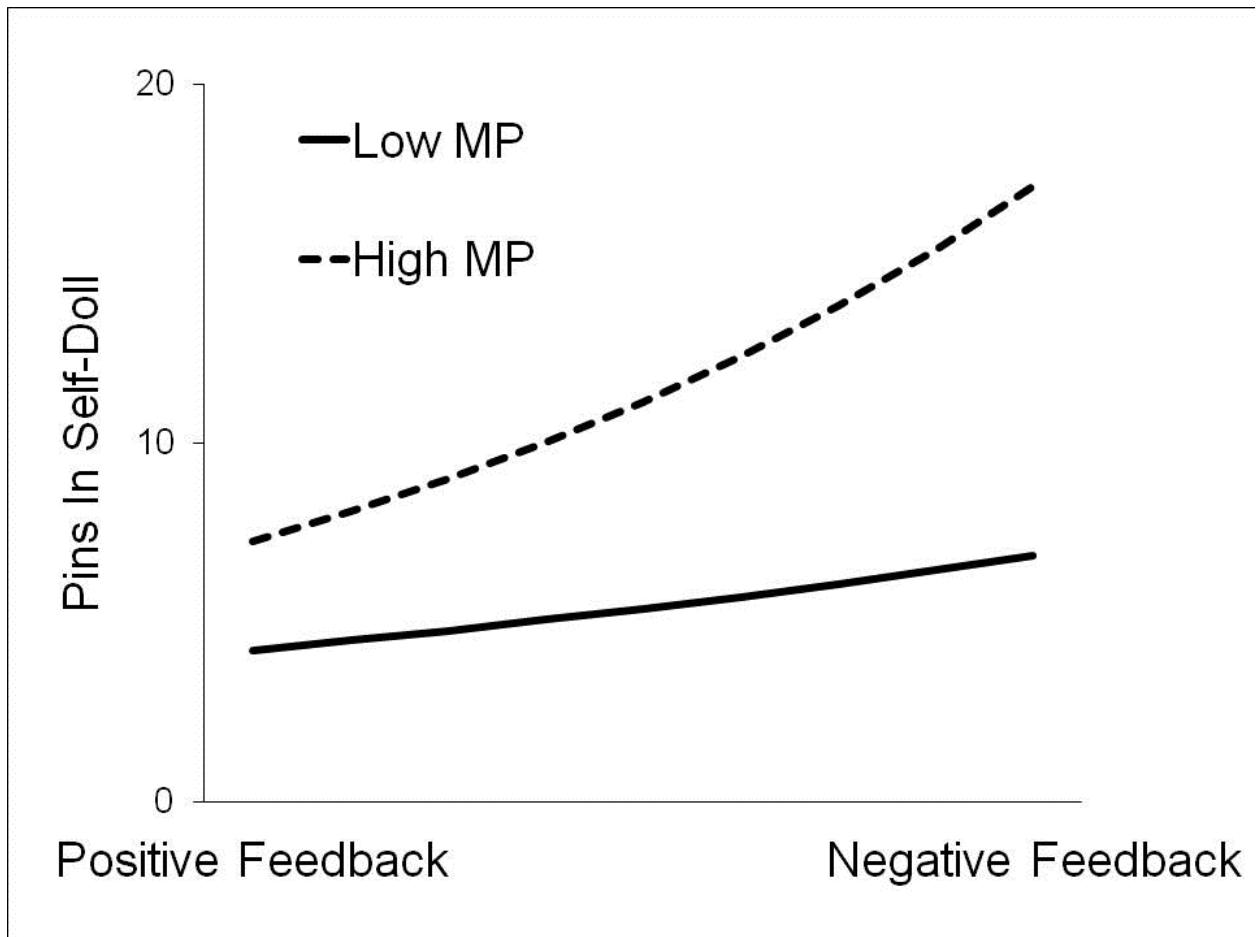
	1	2	3	4	5
1. APS - Discrepancy					
2. APS - Order	.22*				
	(.19,.26†)				
3. APS - Standards	.02	.46***			
	(-.05,.11)	(.52***,.41**)			

4. PANAS - Negative	.40***	.19†	.02		
	(.38*,.43***)	(.12,.26†)	(-.06,.14)		
5. PANAS - Positive	-.05	.11	.23*	.18†	
	(-.01,-.07)	(.28†,-.01)	(.45**,-.01)	(.15,.47**)	
6. VDT	.35**	.25*	.07	.28**	-.19†
	(.20,.47**)	(.20,.28†)	(.04,.13)	(.16,.28†)	(.07,-.23)

†$p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$

Receiving positive feedback caused participants to place a greater amount of pins in the doll that represented themselves, $B = 0.82$, $X^2 = 115.46$, $p < .001$. After controlling for the effect of both Order, $B = 0.23$, $X^2 = 31.77$, $p < .001$, and Standards, $B = -0.01$, $X^2 = 0.07$, $p = .799$, subscales of the APS-R, Discrepancy scores moderated the effect of negative feedback on self-aggression, $B = 0.13$, $X^2 = 6.65$, $p = .010$ (Figure 2).

Figure 2. Poisson loglinear regression lines representing the effect of negative feedback on self-directed aggression on the voodoo doll task as moderated by maladaptive perfectionism (MP). High and low values represent +1 and -1 standard deviation from the mean, respectively.

Subsequent analyses tested simple effects and slopes of the interaction while controlling for Order and Standards subscale scores. Among participants who received negative feedback, Discrepancy scores were positively associated with the number of pins placed in the doll, $B = 0.33$, $X^2 = 100.06$, $p < .001$. A similar, though weaker pattern of results were observed among those who received positive feedback, $B = 0.17$, $X^2 = 16.36$, $p < .001$. At low (-1 SD) levels of Discrepancy scores, negative feedback caused individuals to place more pins in the doll than positive feedback, $B = 0.48$, $X^2 = 14.21$, $p < .001$, as well as at high (+1 SD) levels, $B = 0.86$, $X^2 = 92.86$, $p < .001$.
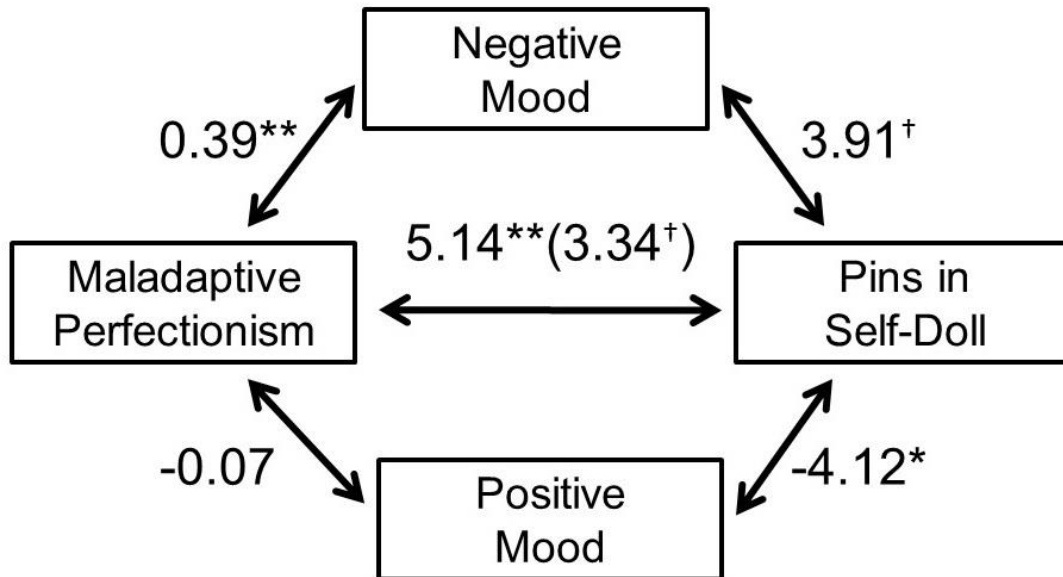
Mediation by Negative Affect

Because our hypotheses only pertained to the negative affect that results from negative feedback, not from positive feedback, we focused our analyses on the negative feedback condition. Suggesting specificity to maladaptive perfectionism, negative mood scores from the entire PANAS were positively associated with the discrepancy subscale of the APS-R after controlling for the Order and Standard subscale, $\beta = .39$, $t(42) = 2.63$, $p = .012$. The discrepancy subscale was unassociated with positive affect, $\beta = -.07$, $t(42) = -0.44$, $p = .666$. The other two subscales were unassociated with negative and positive mood, βs $< .14$, ps $> .40$. Negative mood scores were associated with greater self-aggression, $B = 0.27$, $X^2 = 57.98$, $p < .001$, and positive mood scores were associated with lesser self-aggression, $B = -0.20$, $X^2 = 36.87$, $p < .001$.

A multiple mediation analysis (using 1,000 bias-corrected bootstrap samples; Preacher & Hayes, 2008) showed that the Discrepancy subscale of the APS-R exerted an indirect effect (overall 95% confidence interval: 0.073, 5.179) on the self-aggressive behavior through the negative mood index of the PANAS (95% confidence interval: 0.012, 4.166; Figure 3) but not through positive mood (95% confidence interval: -0.792, 1.798). This indirect effect was not observed among participants in the positive feedback condition (95% confidence interval: -0.700, 1.723). Again, this mediation model was tested among individuals in the positive feedback condition as a sensitivity analysis to show that negative affect's mediating role was specific to the experience of negative feedback.

Figure 3. Bootstrapped mediation model whereby greater negative mood, not positive mood, mediated the positive association between maladaptive

perfectionism and self-aggressive behavior. Values represent unstandardized

regression coefficients. †*p* < .08, **p* < .05, ***p* < .01.

Discussion

Supporting our hypotheses, maladaptive perfectionism was associated with greater self-harm after negative feedback. Unexpectedly, this effect also appeared when participants received positive feedback, though the effect was weaker than what we observed in response to negative feedback. These findings suggest that failure is a risk factor, not a prerequisite, for the effect of maladaptive perfectionism on self-harm. Further, maladaptive perfectionism was associated with a substantially stronger effect of negative feedback on aggression. Based on these results, identical forms of negative feedback appear to impact maladaptive perfectionists to a much greater extent which may then put them at a greater risk of aggression. The effect of maladaptive perfectionism on self-aggression was mediated by the greater negative mood that

participants reported in the negative feedback condition. This supports our general

notion that maladaptive perfectionists' tendency to promote harm towards others and

the self is potentially motivated by a greater affective response to failure.

General Discussion

Aggression is a complex behavior that comes with vast costs for individuals and

society. Crucial to reducing aggression is the understanding of who may be at risk for

perpetrating it against others and themselves and what motives them to do so. A

growing body of research has shown that aggression and self-harm are often used to

improve states of negative affect (e.g., Bushman et al., 2001). Maladaptive

perfectionists, because of their tendency to respond to failure with greater levels of

negative affect (e.g., Besser et al., 2004), are possibly an at-risk population for

aggressive behavior as they may use aggression as a means to reduce their

exacerbated distress. Across two studies we sought to test these possibilities across

aggression towards others and the self.

Supporting our proposed link between maladaptive perfectionism and aggressive

behavior, the central facet of maladaptive perfectionism (i.e., focus on the discrepancy

between standards and performance; Slaney et al., 1996) was associated with greater

noise blasts administered to a partner who provided negative, insulting feedback on an

essay. Extending this link to aggression towards the self (i.e., self-harm), maladaptive

perfectionism was associated with a greater number of pins placed in a virtual doll that

represented the self but only after receiving negative, insulting feedback on an essay.

Each of these effects were found above-and-beyond the other, more adaptive facets of

perfectionism: high standards and a desire for order. Thus, it is not merely a desire to achieve lofty and precise goals that drive these effects.

These associations' specificity to situations characterized by failure, negative feedback, and negative affect offer a nuanced, contextualized view of maladaptive perfectionism. Indeed, maladaptive perfectionists are unlikely to be aggressive on a domain general basis, but instead react aggressively to such frustrating situations. Interventions designed to reduce the link between maladaptive perfectionism and aggression should target individuals' reactions to frustrating events, not their aggressive tendencies in general.

Regarding these findings, it remains uncertain whether the negative affect (and the motivation to reduce it) is truly the driving mechanism in the link between maladaptive perfectionism and aggression. Recent theorizing has suggested that proximal affective states (i.e., how you are currently feeling) drive behavior less than the anticipated affective state that the behavior is perceived to engender (Baumeister et al., 2007; DeWall et al., in press). Suggesting that this may occur in the context of violent behavior, research has shown that individuals often aggress to improve the negative mood that results from failed goal attainment and provocation (Bushman et al., 2001). Thus, aggression may not be a direct result of negative affect but instead, aggression may be selected, however unconsciously, as a behavior that is anticipated to alleviate that negative affect. Treatments might gain better traction on reducing the link between maladaptive perfectionism and aggression by reducing the perception that aggression is capable of improving mood. Experimental manipulations that reduce the perceived

efficacy of aggression in improving mood have shown substantial reductions in aggression (e.g., Bushman et al., 1999).

In Study 1, we showed that the effect of maladaptive perfectionism on aggression was mediated by the motivation to use aggression to improve mood. This finding supports the idea that anticipated affect is a key driver of behavior and more specifically, that aggression is perceived as an emotion regulation strategy (Bushman et al., 2001). This drive to improve mood may underpin many of the associations between problematic behaviors that are often selected for their perceived emotion regulating abilities (e.g., bulimia nervosa; Muehlenkamp et al., 2009).

More broadly, our findings offer additional clues regarding why maladaptive perfectionism is associated with a variety of negative outcomes. Striving for perfection can lead people to work hard, pay attention to detail, and overcome adversity. But when setbacks represent cataclysmic events that threaten a people's sense of well-being, they behave aggressively to improve their mood. By realizing that failure and negative feedback are inevitable, people may have less rigid standards and behave aggressively when they come up short.

Limitations and Future Directions

As the chief limitation of both of our studies, maladaptive perfectionism was only linked to aggression in a correlational manner. Future research might experimentally manipulate maladaptive perfectionism to assess the possible causal links between these two constructs. Although this is a rare practice in research on maladaptive perfectionism, a growing number of studies are experimentally creating groups of adaptive and maladaptive perfectionists by asking them to either perform to a high

standard or to perform to that same standard and focus on the discrepancy between the standard and one's performance (e.g., Boone, Soenens, Vansteenkiste, & Braet, 2012). This is a clear next step for research on these constructs.

Another limitation is that Study 1 did not include a neutral or positive feedback condition. Thus, we are unable to detail whether the link between maladaptive perfectionism and aggression is specific to conditions of negative feedback. Because the aggression measure we used included built-in negative feedback in the form of wins, losses, and above-zero noise blast settings from the opponent, including a positive feedback condition would not have alleviated this issue. Future research may assess the specificity of the maladaptive perfectionism – aggression link among conditions of various forms of feedback. An additional limitation is that our findings were obtained with a sub-clinical, undergraduate population. Future research should assess these effects among various clinical populations that show greater levels of maladaptive perfectionism (e.g., obsessive compulsive disorder; Frost et al., 1990). Finally, in Study 2 the motivation to self-harm to improve mood was not measured. Thus, we are unable to assess whether the link between maladaptive perfectionism and self-harm is due to a perceived emotion regulation quality of that behavior. Future research may include such measures to assess whether maladaptive perfectionists hurt themselves to alleviate the sting of failure.

Conclusions

Across two studies, we report the first evidence that maladaptive perfectionism is linked to aggressive behavior towards others and the self. Establishing this link furthers the notion that perfectionism has a dark side that can yield violent outcomes. Placing

and enforcing high standards on others, especially children and adolescents, may then backfire in a dangerous manner if the individuals focus shifts to the discrepancy between these standards and their performance. Our research joins with others to suggest that this discrepant emphasis must be reduced by clinical interventions such that the beneficial effects of encouraging high standards can be realized.

Outside the domain of perfectionism, the findings we report contribute to a growing notion in emotion literature that the effect of affect on behavior may be indirect (Baumeister et al., 2007; DeWall et al., in press). The observed tendency for maladaptive perfectionists motive to anticipate aggression as a mood improver provides additional evidence for this supposition. The corpus of aggression research stands to gain a great deal from this approach. It is our hope that future research assess whether events known to cause aggression (e.g., provocation, rejection, frustration, failure, alcohol consumption) exert their effects through emotion regulation motives and perceptions. Indeed, negative affect in response to events such as exclusion are hard to combat, yet motivations and perceptions that view aggression in a rewarding light are likely more amenable to clinical interventions. Through this novel approach, we are likely to better understand and reduce the costly toll of violence.

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