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Running Head: SELF-REGULATION AND AGGRESSIVENESS

Prevention-Focused Self-Regulation and Aggressiveness

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Abstract

The present research examined the relationship between individual differences in self-regulatory mechanisms as outlined in regulatory focus theory (promotion- and prevention-focused self-regulation) and aggressiveness. Two studies revealed that the more individuals' habitual self-regulatory orientation is dominated by a prevention-focus, the more likely they are to score high on measures of cynical hostility, reciprocity norm endorsement, and aggressiveness. An additional study involving the manipulation of perceived violation of a reciprocity norm showed that predominantly prevention-focused participants were particularly sensitive to the experience of a norm violation and reacted in a hostile and aggressive manner following the norm violation experience. Findings indicate that a prevention-focused style of self-regulation is associated with aggressiveness and suggest that endorsement of (negative) reciprocity norms and sensitivity to norm violations are relevant factors that help explain the differences in aggressiveness observed among individuals with a predominantly prevention-focused style of self-regulation.

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Prevention-Focused Self-Regulation and Aggressiveness

Hostility, aggression, and violence are the source of a great deal of physical pain and psychological damage in human societies across the globe. The frequency with which humans hurt one another is reflected in the fact that it is almost impossible to read through a daily newspaper or to tune into the evening news without being confronted with instances of hostility, aggression or violence. It is evident that the consequences of hostility and aggressiveness continue to be a burden on not only the perpetrators and victims but also the development of human societies at large. Accordingly, the question of when and why people become aggressive and motivated to hurt each other can be understood as one of the most important topics in the social sciences. Understanding the causes of hostility and aggressiveness is therefore an important item on the social scientific research agenda. The current paper is devoted to this item on the agenda. Specifically, we examine the relationship between individuals' style of self-regulation and (a) trait level aggressiveness as well as (b) aggressive behavioral tendencies. In our analysis, we focus on one particular mode of self-regulation that reflects a commitment to oughts and duties and that can be described as vigilant and prevention-oriented in character.

Recent social psychological research has documented that many fundamental social cognitive as well as social interactive mechanisms are heavily influenced by the situationally or habitually activated type of self-regulatory orientation, which affects individuals' thought processes and behavioral tendencies (for an overview on self-regulation research, see Baumeister and Vohs, 2004). One specific theoretical perspective figures prominently in the field of research on self-regulatory orientations: regulatory focus theory (RFT) introduced by Higgins (Higgins, 1997; 1998). RFT holds that two basic modes of self-regulation can be differentiated. In the *prevention* mode of self-regulation, individuals strive to achieve safety and security, fulfill their duties and obligations, and avoid losses. In the *promotion* mode of self-regulation, individuals are

guided by the need for nurturance and growth, the desire to reach their ideal goals and aspirations, and the motivation to achieve gains.

RFT has been applied to an impressively wide spectrum of topics and psychological phenomena across a diverse array of domains (for an overview, see Higgins and Spiegel, 2004). The existing evidence shows that a vast number of social cognitive as well as social interactive phenomena can be related to the basic self-regulatory orientations outlined in RFT. The present contribution aims to explore the role of RFT with respect to an important social interactive phenomenon, *aggressiveness*, by testing the hypothesis that a prevention-focused self-regulatory orientation is associated with aggressive tendencies. Somewhat surprisingly, there is very little research on the role of self-regulatory mechanisms in aggressiveness. In fact, Bettencourt, Talley, Benjamin, and Valentine (2006) recently noted in their meta-analytic review on personality and aggressive behavior that theories of aggression have largely ignored the role of self-regulation in aggressive behavior. The current research aims to address this theoretical and empirical gap.

The present contribution also attempts to integrate ideas proposed in RFT and the General Aggression Model (GAM) (Anderson & Bushman, 2002). Specifically, we start from the basic assumption that several of the personal and situational *input factors* proposed in the GAM (i.e., variables that increase the probability of aggressive behavior in a given situation) can be associated with constructs and mechanisms that are relevant for *prevention-focused self-regulation*. The three studies reported in the current paper present empirical analyses focusing on (a) the relationship between distinct *personal* input factors that share a conceptual association with aggressive tendencies and prevention-focused self-regulation, and (b) the interaction of one specific *situational* input factor, namely experience of a norm violation, with prevention-focused self-regulation. In the following sections we outline in detail the theoretical underpinnings of the

proposed relationship between prevention-focused self-regulation and aggressiveness, starting with a short introduction to RFT.

Core Assumptions of Regulatory Focus Theory

Extending the basic hedonic principle that people approach pleasure and avoid pain, RFT holds that it is necessary to differentiate among *distinct* types of pleasures and *distinct* types of pain, and to assess the specific strategic orientations and types of goal pursuit that reflect self-regulation guided by two distinct motivational systems – promotion focus and prevention focus. Self-regulation with a promotion focus is characterized as the motivation to attain growth and nurturance, bring one's actual self into alignment with one's ideal self, and reach gains (and avoid non-gains). In contrast, self-regulation with a prevention focus entails the motivation to attain security, bring one's actual self into alignment with one's ought self (i.e., fulfilling one's duties and obligations), and avoid losses (and attain non-losses).

Research on RFT (see Higgins, 1998; Higgins & Spiegel, 2004 for reviews) shows that both types of regulatory orientations are related to specific consequences. The psychological consequences of promotion-focused self-regulation are: (a) a special sensitivity to the presence or absence of positive outcomes, (b) application of eager strategic means, (c) ambitious and keen striving to reach one's aspirations as reflected in tenacious goal pursuit that is focused on maximal goals, and (d) cheerfulness-dejection emotions in response to positive and negative events. In contrast, the psychological consequences of prevention-focused self-regulation are: (a) a special sensitivity to the presence or absence of negative outcomes, (b) application of vigilant strategic means, (c) a risk-averse and defensive orientation in the pursuit of minimal goals, and (d) quiescence-agitation emotions (i.e., relaxation versus worry and anxiety) in response to positive and negative events. In our theoretical considerations, we focus on the consequences regarding *differential sensitivity*, specifically on the sensitivity to negative outcomes and cues associated with prevention-focused self-regulation.

According to RFT, the two self-regulatory systems can be *situationally* induced (e.g., Freitas, Liberman, & Higgins, 2002; Friedman & Förster, 2001; Shah, Higgins, & Friedman, 1998). However, and most important in the present context, RFT posits that individuals may differ in their predominant *chronic* or *habitual* self-regulatory orientations. Several measures to assess individual differences in self-regulatory orientation have been developed (e.g., regulatory focus questionnaires, cf. Higgins et al; 2001; Keller, 2007; Lockwood, Jordan, & Kunda, 2002; regulatory strength measures, cf. Shah, Higgins, & Friedman, 1998). It is important to note that the two modes of self-regulation have been conceptualized as *independent* constructs. In line with this proposition, measures of the two chronic regulatory foci have been found to be largely uncorrelated or slightly positively correlated (cf. Higgins et al., 2001; Lockwood, et al., 2002; Keller, 2007). Thus, prevention-focused self-regulation does *not* represent the opposite pole of promotion-focused self-regulation. This implies that it is possible that one of the two modes is associated with a certain psychological phenomenon, while the other mode is not. The present studies examine the relationship between prevention-focused self-regulation and aggressiveness by integrating ideas of RFT and the GAM, which we will describe next.

Input Factors in the General Aggression Model (GAM)

The theoretical framework underlying the GAM (Anderson, 1997; Anderson & Bushman, 2002; Anderson, Deuser, & DeNeve, 1995) is based on a distinction of *person* and *situational* variables as *input factors* contributing to aggressive tendencies. According to the model, these input factors exert their impact on appraisal and decision processes (i.e., the outcomes of episodic aggression processes) via cognitive, affective, and arousal routes. The *person factors* discussed in the GAM include traits (e.g., susceptibility towards hostile attributions, unstable/labile self-esteem), sex, beliefs that are related to a preparedness to aggress (e.g., self-efficacy beliefs), attitudes (towards violence), values (e.g. normative convictions about what one should or ought to do; e.g., reciprocity beliefs), long-term goals, and the availability and accessibility of

behavioral scripts. The *situation factors* discussed in the GAM include aggressive cues (e.g., weapons), provocation and frustration (insults, goal interference, perceived injustice), pain and discomfort (e.g., heat, noise, unpleasant odors), drugs (e.g., alcohol, caffeine), and incentives (perceived cost/benefit ratio). The present research was designed to assess how several of these personal and situational input variables discussed in the GAM relate to the distinct self-regulatory orientations proposed in RFT.

Note that most of the recent research in the context of the GAM focused on the *routes* to aggression and how *cognitive* mechanisms (i.e., the role of knowledge structures and knowledge accessibility) contribute to aggressive behaviors (cf. Anderson, 1997; Anderson & Dill, 2000; Bushman, 1995). The present approach contributes to existing research on the GAM by focusing on how *motivational (self-regulatory)* mechanisms relate to specific *input factors* proposed in the GAM.

Self-Regulation and Aggressiveness

There is good reason to expect that self-regulatory mechanisms can help us understand the underlying factors and processes of human aggression. In the section below, we describe the general rationale underlying the hypothesized link between prevention-focused self-regulation and aggressiveness.

Prevention-Focused Self-Regulation and Aggressiveness

As outlined above, the GAM proposes distinct *personal* and *situational* variables as input factors contributing to aggressive tendencies. The core assumption underlying the present research holds that self-regulatory orientations are meaningfully related to several of these input factors. Specifically, we propose that a prevention-focused style of self-regulation is related (a) to personal factors that have been shown to be associated with increased aggressive tendencies (e.g., hostile attribution bias, hostility, labile-self-esteem, neuroticism, rumination, distrust¹), and (b) to situational factors that have been documented to trigger aggressive reactions in individuals

(e.g., observing other people's norm violation; experiencing injustice). Accordingly, we propose that prevention-focused self-regulation is positively related to aggressiveness because this style of self-regulation involves several aspects that are known input factors of aggressive tendencies - specifically, sensitivity to rule violations, reciprocity norm endorsement, hostile attribution tendency, and a general cynical and misanthropic perspective on the world.

At first sight, this assumption may appear paradoxical given that prevention-focused self-regulation is typically characterized by a fear of doing the wrong thing associated with a risk-averse and careful behavioral orientation. Note, however, that the prevention-focus is not necessarily related to risk-averse avoidance and flight tendencies (cf. Scholer, Stroessner, & Higgins, in press). Specifically, under circumstances of threat and negative experiences (such as rule violations) an active response strategy reflecting a fighting spirit can serve the basic prevention-focused goal of reaching safety and security. That is, protecting and maintaining safety and security sometimes can require offensive acts reflecting a fight (rather than flight) response as well as retribution and reciprocation of negative treatments. Moreover, a concern with ought standards (such as rules and normative standards, e.g., the reciprocity norm) is most likely associated with a tendency to punish those who violate relevant normative standards in the attempt to maintain the normative status quo. In combination, several aspects of prevention-focused self-regulation suggest that this style of self-regulation may be related to aggressive tendencies.² In the sections below we outline the relation between prevention-focused self-regulation and prominent personal and situational input factors proposed in the GAM which support the assumed positive relation between the prevention-focus and aggressiveness.

Prevention-focused self-regulation and personal input factors in the GAM. Based on conceptual and empirical considerations it can be assumed that prevention-focused individuals are likely to (1) score high on measures of neuroticism, (2) show hostile attribution biases, (3) have labile self-esteem, (4) engage in ruminative thinking, (5) endorse (negative) reciprocity

norms, and (6) be chronically skeptical, cynical (distrustful), and hostile. One underlying reason for these assumptions is the relationship between punitive parenting styles and a chronic prevention-focus which has been empirically supported by recent research findings (Keller, in press; Manian, Strauman, & Denny, 1998). Given that punitive parenting styles have also been shown to be related to several critical personal factors that render individuals prone to aggressive tendencies (cynical hostility, cf. Sarason, Ganzer, & Granger, 1965; hostile attribution bias, cf. Gomez & Gomez, 2000; Gomez, Gomez, DeMello, & Talent, 2001; labile self-esteem, cf. Kernis, Brown, & Brody, 2000), it seems plausible to assume a relationship between these personal factors and the prevention-focus. Moreover, neuroticism (a known factor in the development and expression of aggressive tendencies; cf. Bettencourt et al., 2006) is conceptually closely related to the emotional component of the prevention-focus (worry and anxiety; cf. Higgins, 1998), which suggests a close association between prevention-focused self-regulation and this particular personality trait.

Recent findings obtained in our lab indicate a reliable association between the prevention-focus and the distinct personality traits mentioned above. Specifically, it emerged that the habitual tendency to engage in prevention-focused self-regulation was positively correlated with neuroticism, labile self-esteem, ruminative thinking, cynicism, interpersonal distrust, and hostility (Keller, 2007; Keller et al., 2007). These empirically documented associations between several of the proposed personal input factors of aggression and the prevention-focus suggest a positive relationship between this style of regulatory focus and aggressive tendencies.

Prevention-focused self-regulation and situational factors in the GAM. Regarding the relationship between prevention-focused self-regulation and distinct *situational input factors*, it has been proposed – based on the differential sensitivity assumption outlined earlier – that the special sensitivity of prevention-focused individuals to negative events and cues may make those individuals particularly prone to act and react aggressively. That is, higher perceptual sensitivity

and sensibility towards negative events and cues may render predominantly prevention-focused individuals particularly “vulnerable” to such cues, making them more likely to display aggressive reactions and tendencies. Note that it seems plausible to assume that the particular sensitivity and attentional focus of prevention-focused individuals to negative events and cues may - in the long run - result in a cynical and skeptical perspective on the social world in general, which may be described as a misanthropic and hostile attitude. And since hostility represents one crucial aspect underlying aggression and aggressiveness, the degree to which an individual endorses such a hostile and misanthropic attitude is most probably related to the individual’s level of aggressiveness.

Overall, the analysis outlined above leads to the hypothesis that there is a significant positive relationship between the prevention-focus and aggressive tendencies. As a starting point, we tested this basic assumption in Studies 1 and 2, where we assessed the relationship between self-report measures of regulatory focus and self-report measures of (a) aggression (Buss & Perry, 1992) and (b) cynical hostility (Cook & Medley, 1954), as well as measures of other constructs that represent established correlates of aggressive tendencies (rumination and neuroticism). Study 2 also included measures of reciprocity norm endorsement to test the assumption that beliefs reflecting reciprocity norm endorsement (particularly *negative* reciprocity norm endorsement) are related to aggressiveness. Previous research has shown that negative reciprocity norm endorsement is significantly related to anger, vengeance, and a cynical perspective regarding other people (Eisenberger et al., 2004). These findings suggest a meaningful association between reciprocity norm endorsement and aggressiveness. Moreover, because a prevention-focus implies a concern with duties and responsibilities reflecting a concern with norms and normative standards, it seems plausible to assume that reciprocity norm endorsement is a distinct characteristic of predominantly prevention-focused individuals (a more elaborate discussion of this aspect is presented in the introduction to Study 2 below). Finally,

Study 3 examined the prevention-focus-aggressiveness link by testing the effect of the manipulation of the experience of a norm violation on aggressive tendencies.

Study 1

The goal of Study 1 was to assess the relationship between chronic regulatory focus orientations and related constructs (such as rumination) and individual differences in aggressiveness and related constructs (specifically, cynical hostility).

Participants and Procedure

Two independent samples of students at the University of Mannheim (Study 1a: $N = 90$; $M_{\text{age}} = 23.4$; 39 women) and the University of Michigan (Study 1b: $N = 38$; $M_{\text{age}} = 23.0$; 27 women) completed measures designed to assess habitual levels of aggressiveness and regulatory focus, as well as an aggressiveness-related trait, cynical hostility. Rumination was assessed in Study 1a only. In both studies, responses were assessed using 7-point response scales; the only exception was the Buss and Perry (1992) aggression questionnaire used in Study 1b, where 5-point response scales were used (in Study 1a we used 7-point scales for this instrument as well). Unless indicated otherwise, all scale endpoints were labeled *not at all true* and *completely true*.

Measures

Aggressiveness. We used the Buss and Perry (1992) aggression questionnaire to assess trait aggressiveness. Sample items of the three subscales used in the present studies read: “When frustrated, I let my irritation show” (anger subscale); “When people annoy me, I may tell them what I think of them” (verbal aggression subscale); and “When people are especially nice, I wonder what they want” (hostility subscale). We used the overall aggressiveness scores in the subsequent analyses (overall $\alpha s = .85$ in both Studies 1a and 1b).

Regulatory focus. We assessed habitual self-regulatory orientations using the *regulatory focus scale* developed by Lockwood et al. (2002) which consists of a prevention focus subscale (9-items, $\alpha = .76$ [Study 1a] and $\alpha = .86$ [Study 1b], sample item: “In general, I am focused on

preventing negative events in my life”) and a promotion focus subscale (9-items, $\alpha = .81$ [Study 1a] and $\alpha = .84$ [Study 1b], sample item: “I frequently imagine how I will achieve my hopes and aspirations”).

Cynical hostility. We also assessed cynical hostility (Cook & Medley, 1954) as an aggressiveness-related measure relevant to the present context. Sample items read: “Most people will use somewhat unfair means to gain profit or an advantage rather than to lose it,” and “No one cares much what happens to you” (assessed with dichotomous true / false response options; $\alpha = .69$ [Study 1a] and $\alpha = .73$ [Study 1b]).

Ruminative thinking. In Study 1a we also assessed participants’ tendency to engage in ruminative thinking, which reflects an attentional focus on negative events and negative aspects in life in general and, with a short version of the rumination scale used by Fresco, Frankel, Mennin, Turk, and Heimberg (2002; adapted from Nolen-Hoeksema, Morrow, & Fredrickson, 1991). Participants completed this 9-item measure with response scales ranging from 1 (*almost never*) to 7 (*almost always*) after reading the following lead-in statement: “Please indicate how often you think and act the way described in the respective statement.” Sample items are: “Think about all your shortcomings, failings, faults, and mistakes,” and “Think about how sad you feel” ($\alpha = .91$). This measure was included as an indicator of the differential sensitivity mechanism according to which prevention-focused self-regulation is related to a heightened focus on negative aspects in life. Moreover, since previous research has revealed that ruminative thinking is related to aggressiveness (e.g., Bushman, 2002; Bushman, Bonacci, Pedersen, Vasquez, & Miller, 2005; Verona, 2005), this construct was expected to function as an underlying factor in the proposed association between prevention-focused self-regulation and aggressiveness.

Results and Discussion

To test the relationship between regulatory orientation and aggressiveness we computed zero-order correlations (see Table 1) as well as regression analyses. In Studies 1a and 1b, the

prevention focus scale was significantly positively correlated with the trait aggressiveness scale, a finding supportive of the proposed association between these constructs. The promotion focus scale did not correlate with aggressiveness. In a finding supportive of the differential sensitivity assumption, the prevention-focus scale was positively and robustly correlated with rumination.

Regression analyses with aggressiveness as the criterion variable controlling for promotion (Model 1 in Table 2) and cynical hostility scores (Model 2 in Table 2) reveal that controlling for promotion scores has no meaningful impact, whereas the prevention – aggressiveness relationship drops substantially, but remains significant, when cynical hostility is controlled for. This suggests that it is not only the tendency to perceive the social world from a cynical perspective that contributes to the relationship between prevention-focus and aggressiveness and that there must be some other processes or mechanisms that contribute to this link.

To test the potential role of ruminative thinking in the link between the prevention-focus and aggressiveness, we entered ruminative thinking scores into the regression model (for Study 1a) as an additional predictor. As shown in Model 3 in Table 1, prevention-focus ceases to be a significant predictor of aggressiveness when ruminative thinking scores are controlled for. Thus, negative cynical thinking and rumination appear to be important underlying mechanisms in the link between the prevention-focus and aggressiveness, with rumination being a more powerful factor accounting for this link.

Overall, these results support the reasoning that a prevention-focused self-regulatory orientation is positively related to aggressiveness. We observed this association in two samples (in the USA and Germany) with different cultural backgrounds. Moreover, we found that negative thinking (as reflected in cynical hostility and rumination) seems to be a process underlying the relationship between prevention-focus and aggressiveness. To advance the validity and reliability of the obtained findings, we conducted Study 2 to gather further empirical evidence.

Study 2

Study 2 was designed to test the robustness of the link between the prevention-focus and aggressiveness by employing an alternative measure of self-regulatory orientation. Moreover, Study 2 examined the role of neuroticism and reciprocity norm beliefs in the link between the prevention-focus and aggressiveness.

Neuroticism reflects the emotional component of prevention-focus (cf. Higgins, 1998) and has been found to relate to aggressiveness (cf. Sharpe & Desai, 2001; von Collani & Werner, 2005). Thus, neuroticism represents a construct with the potential to explain the link between the prevention-focus and aggressiveness. Moreover, ruminative thinking, which we found to underlie the relationship between prevention-focus and aggressiveness in Study 1, has been established as a close correlate of neuroticism and anxiety (cf. Kuyken, Watkins, Holden, & Cook, 2006; Nolen-Hoeksema, 2000; Roberts, Gilboa, & Gotlib, 1998; Trapnell & Campbell, 1999). Thus, existing evidence suggests that neuroticism may contribute to the link between the prevention-focus and aggressiveness, an assumption we tested in Study 2.

In addition to exploring the role of neuroticism in the link between the prevention-focus and aggressiveness, Study 2 also examined the role of *reciprocity norm beliefs* in this link with a particular focus on *negative* reciprocity. The reciprocity norm prescribes that one should return favors and retaliate against infringements (Gouldner, 1960). In other words, it refers to the obligation to help those who helped us in the past and to retaliate against those who have been detrimental to our interests and well-being (Perugini et al., 2003). This conceptualization reveals that reciprocity can be positive or negative. The positive reciprocity norm deals with the obligation to repay favorable treatment; the negative reciprocity norm deals with retribution as a response to unfavorable treatment (Gouldner, 1960). Reciprocity norm *beliefs* refer to the internalization of these reciprocity norms, with negative reciprocity beliefs referring to the internalization of the negative reciprocity norm and positive reciprocity beliefs referring to the

internalization of the positive reciprocity norm. As with any norm endorsement, individuals differ in the extent to which they hold these beliefs (Eisenberger et al., 2004; Perugini et al., 2003).

Examining the role of reciprocity norm beliefs seems to be promising in the present context for several reasons. From a theoretical perspective, prevention-focused self-regulation implies a preoccupation with duties and responsibilities, reflecting a concern with norms and normative standards. Thus, prevention-focused self-regulation should increase sensitivity to the normative appropriateness of others' responses (i.e., whether one's actions are reciprocated in line with a general reciprocity norm). In the most general terms, reciprocity norm endorsement should be observed among predominantly prevention-focused individuals, regardless of whether the focus is on negative or positive forms of reciprocity. Given the focus of the current research on aggressiveness and its relationship to the prevention-focus and the existing evidence on the link between negative reciprocity beliefs and aggressiveness (and related constructs; cf. Eisenberger, et al., 2004; Eder et al., 2006), we are particularly interested in the role of *negative* reciprocity. Reciprocating negative behavior displayed by others can be seen as reflecting the motivation to attain security and to avoid (or minimize) losses - which is particularly relevant to prevention-focused individuals. Specifically, retaliating against the harmful behavior of others may help individuals to protect themselves from further hurtful behavior in the future, and may be experienced and construed as a fair and normatively appropriate compensation for losses or infringements experienced in previous interactions. Moreover, Perugini et al. (2003) suggested that negative reciprocity behavior involves sensitivity to negative interpersonal events, which represents a defining feature of prevention-focused self-regulation. Thus, we hypothesize that the endorsement of reciprocity beliefs in general (and negative reciprocity in particular) is related to prevention-focused self-regulation.

In addition, there is reason to assume that the endorsement of negative reciprocity beliefs could be related to aggressiveness. From a conceptual perspective, it seems evident that negative reciprocity should be closely related to reactive aggression – which can be defined as aggressive acts committed *in response* to provocation or frustration (Dodge, 1991; Dodge, Lochman, Harnish, Bates, & Pettit, 1997; Miller & Lynam, 2006). Thus, reactive aggression can in some sense be understood as the behavioral expression of negative reciprocity. Hence, it seems likely that individuals who strongly endorse negative reciprocity beliefs are more likely to engage in acts reflecting reactive aggression. From an empirical perspective, previous research has shown that negative reciprocity norm endorsement is significantly related to anger, vengeance, and a cynical perspective regarding other people. For example, using self-report and behavioral measures, Eisenberger et al. (2004) showed that negative reciprocity norm beliefs are strongly related to anger in everyday life and anger following mistreatment by others. Accordingly, it seems plausible to assume that negative reciprocity norm endorsement is meaningfully related to aggressiveness.

Research by Perugini and colleagues (2003) revealed that endorsement of negative reciprocity norms in the behavioral domain is positively associated with reciprocation wariness, that is, cautiousness in reciprocating help, resulting from a fear of being taken advantage of, and negatively associated with proneness to forgive and with emotional stability (the opposite of neuroticism). Perugini et al. (2003) further showed that individuals who strongly endorse negative reciprocity beliefs are less generous and more likely to engage in punishments in the face of negative behavior. Moreover, Eder and colleagues (2006) found that individuals who endorse the negative reciprocity norm are particularly likely to see retaliation as a proper response to wrongdoing.

The correlates of negative reciprocity norm endorsement that reflect its relationship with anger, retaliation, and aggressiveness suggest that this construct may be another important

potential candidate to explain the link between prevention-focused self-regulation and aggressiveness. Study 2 was designed to test the potential role of this construct in addition to the explanatory power of neuroticism - which represents an established risk factor regarding aggression (Bettencourt et al., 2006; Sharpe & Desai, 2001; von Collani & Werner, 2005).

Method

Participants and Procedure

University of Mannheim students ($N = 88$, $M_{\text{age}} = 23.2$; 46 women) filled out a questionnaire that consisted of two self-regulatory measures and scales that assessed aggressiveness, cynical hostility, neuroticism, and reciprocity norm beliefs.

Measures

Regulatory focus. Participants completed the same regulatory focus measure used in Study 1 (Lockwood et al., 2002) ($\alpha_{\text{Promotion}} = .83$; $\alpha_{\text{Prevention}} = .78$), as well as an alternative instrument recently developed and validated in our lab to assess self-regulatory focus (Keller, 2007) that comprises a prevention subscale ($\alpha = .83$, sample item: “My life is often shaped by fear of failure and negative events”), and a promotion subscale ($\alpha = .76$, sample item: “If I know that my performance is being evaluated by other people, that spurs me on and increases my ambition to do well”). Replicating previous findings (reported in Keller, 2007), the congruent subscales of the two regulatory focus measures (i.e., the Lockwood et al. and the Keller measure) were significantly correlated (prevention subscales: $r = .65$, $p < .001$; promotion subscales: $r = .43$, $p < .001$), whereas the correlations involving incongruent dimensions of self-regulation were not significant ($r = .15$, *n.s.*, and $-.10$, *n.s.*, respectively).

Aggressiveness. As in Study 1, we used the Buss and Perry (1992) aggression measure to assess trait aggressiveness (in this case, we assessed the physical aggression subscale as well). Parallel to Study 1, the overall aggressiveness score ($\alpha = .90$) was used in the analyses reported below.

Cynical hostility. The same measure as in Study 1 (Cook & Medley, 1954) was used to assess cynical hostility ($\alpha = .64$).

Neuroticism. We used a German version (Eggert, 1983) of Eysenck's personality inventory to assess neuroticism ($\alpha = .86$).

Reciprocity norm beliefs. We used two measures to assess reciprocity norm beliefs. One of these measures was developed by Eisenberger et al. (2004) and consists of two subscales that assess positive reciprocity norm beliefs (10 items, sample item: "If someone does me a favor, I feel obligated to repay them in some way") and negative reciprocity norm beliefs (14 items, sample item: "If someone dislikes you, you should dislike them"). We used short versions of both subscales (each scale comprising 7-items; $\alpha_{\text{negative reciprocity}} = .87$, $\alpha_{\text{positive reciprocity}} = .81$). (Note: negative reciprocity norm as assessed by this measure refers to advisability of retribution for unfavorable treatment).

The second measure of reciprocity norm beliefs was developed by Perugini and colleagues (2003) and consists of three subscales with each subscale comprising 9 items. A sample item of the *beliefs in reciprocity* subscale reads: "If I work hard, I expect it will be repaid" ($\alpha = .77$). A sample item of the *positive reciprocity* subscale reads: "I'm ready to do a boring job to return someone's previous help" ($\alpha = .74$). A sample item of the *negative reciprocity* subscale reads: "If somebody is rude to me, I become rude" ($\alpha = .86$). (Note: negative reciprocity as assessed by this measure refers to negative reciprocity as expressed in behaviors). In the analyses reported below, we used a composite score based on the two negative reciprocity norm subscales in order to have both the cognitive and behavioral aspects of negative reciprocity represented in the measure ($\alpha = .93$). Since both scales were highly correlated ($r = .78$), use of a composite score was also appropriate in order to avoid analyses that could potentially suffer from problems of multicollinearity.

Results and Discussion

In line with our theoretical analysis and the findings obtained in Study 1, data revealed significant zero-order correlations between both prevention scales and aggressiveness scores (see Table 3). Both prevention scale scores were also significantly positively correlated with scores of cynical hostility, replicating the pattern observed in Study 1. As in Study 1, neither promotion focus scale was meaningfully correlated with aggressiveness or cynical hostility.

Reciprocity norm endorsement scores as measured by two different scales were positively associated with prevention focus scores, with the exception that prevention focus scores on the Lockwood et al. scale were not reliably associated with negative reciprocity as measured by Eisenberger et al. (2004). Replicating previous research, reciprocity beliefs were also positively related to scores on aggressiveness and cynical hostility, with the exception of positive reciprocity beliefs measured with Perugini et al.'s (2003) scale.

Next, we computed regression analyses in order to test whether the correlates of prevention-focused self-regulation (negative reciprocity, neuroticism, and cynical hostility) help explain the relationship between habitual prevention-focused self-regulation and aggressiveness. In keeping with the analysis conducted in Study 1, we ran initial analyses including promotion and prevention scale scores as predictors (see Table 4; analyses are reported separately for the Lockwood et al. and the Keller scales). Parallel to Study 1 we found that prevention but not promotion scale scores were significantly related to aggressiveness (Model 1). Next, we tested whether this relation could be explained by negative reciprocity norm beliefs. The analysis revealed that controlling for negative reciprocity norm beliefs (composite measure) markedly reduced the strength of the relationship between prevention and aggressiveness, indicating that negative reciprocity norm beliefs are in part involved in the relationship between prevention-focused self-regulation and aggressiveness (Model 2).³ We then added cynical hostility into the regression model. As depicted in Table 4 (Model 3), including cynical hostility scores resulted in a substantial drop in the relationship between the prevention-focus and aggressiveness,

replicating the pattern observed in Study 1. Finally, we added neuroticism (Model 4) and found that prevention focus scores are no longer a significant predictor in the regression models when negative reciprocity beliefs, cynical hostility, and neuroticism are controlled for. That is, our findings show that negative reciprocity beliefs, cynical hostility, and neuroticism contribute to understanding the link between prevention-focused self-regulation and aggressiveness.

A critical reader may come to the conclusion that the relation between prevention-focused self-regulation and aggressiveness may be reducible to the correlation between neuroticism and aggressiveness. We argue against this interpretation referring to several reasons. First, neuroticism is only a marginally significant predictor in one of the two regression models in Study 2 (see Model 4, right panel in Table 4). It seems not adequate to argue that the association between prevention-focused self-regulation and aggressiveness is reducible to the impact of neuroticism when the latter factor is not even a reliable predictor in the model. Second, partial correlations between the two prevention focus scales and aggressiveness remain marginally significant when controlling for neuroticism scores ($r = .19, p < .09$ and $r = .18, p < .10$, respectively). Third, neuroticism is only one among several distinct elements in the conceptualization of the prevention-focus (reflecting the affective component of this style of self-regulation; cf. Higgins, 1998) and it would be misleading to argue that prevention-focused self-regulation can be reduced to neuroticism. Supporting the distinction between neuroticism and prevention-focused self-regulation, other lines of research in our lab revealed that the relations between prevention-focused self-regulation and other phenomena – for example interpersonal trust (Keller et al. 2007) and value orientations (Keller, 2007) – remain robust and hardly differ from zero-order correlations when neuroticism is controlled for. Finally, it is important to note that - in contrast to the prevention focus scales - neuroticism was not significantly related to negative reciprocity norm endorsement (see Table 3), a factor that is of critical relevance with

respect to aggressiveness. Accordingly, we think it is fair to conclude that prevention-focused self-regulation and neuroticism represent two distinct (although related) constructs.

Summarizing the results of Studies 1 and 2, one can say that the obtained findings concur with the proposition that there is a significant positive relationship between prevention-focused self-regulation and aggressiveness. Importantly, findings are robust across different samples and across measures of regulatory focus. Several aspects are particularly noteworthy with respect to the findings obtained in Study 2. First, replicating the pattern observed in Study 1, we observed that cynical hostility partially contributes to the link between prevention focus and aggressiveness; however, it does not fully mediate this link. Second, endorsement of negative reciprocity norm beliefs is found to be a partial mediator of the relationship between prevention-focused self-regulation and aggressiveness. Thus, sensitivity to normative standards and the expectation to reciprocate others' negative behavior in part explains the relationship between prevention focus and aggressiveness. Third, the neuroticism findings indicate that the emotional aspect of prevention-focused self-regulation that involves worry and anxiety also contributes to the relationship between prevention-focused self-regulation and aggressiveness. This finding is in line with previous results (cf. Bettencourt et al. 2006; Sharpe & Desai, 2001; von Collani & Werner, 2005) documenting a prominent role of neuroticism in the development and expression of aggression. In sum, these findings add to our understanding of the underlying personality mechanisms contributing to the observed relationship between prevention-focused self-regulation and aggressiveness.

The observed results documenting a positive association between aggressiveness and prevention-focused self-regulation appear particularly noteworthy in view of the available evidence pointing to the fact that personality characteristics related to prevention-focused self-regulation - such as cynicism, distrust as well as anxiety and neuroticism - shifted to higher levels during recent decades (Kanter & Mirvis, 1989, Twenge, 2000). From our perspective, the upward

shift in these critical personality characteristics across birth cohorts is particularly problematic in light of the fact that these characteristics are correlated with hostility and aggressiveness.

The Interplay of Personal and Situational Input Factors

Up to this point, our empirical analyses have focused on personality factors and the role they play in the association between prevention-focused self-regulation and aggressiveness. However, as outlined in the theoretical introduction, we suppose that several *situational* input factors as discussed in the GAM may also be related to prevention-focused self-regulation. We assume – based on the differential sensitivity mechanism proposed in RFT – that prevention-focused self-regulation is related to a special sensitivity to negative aversive cues in general, and to one aversive cue that is known to increase aggressiveness, in particular: the experience or observation of norm violations. Specifically, we propose that rendering reciprocity norm violation salient may trigger aggressive tendencies particularly strongly in prevention-focused individuals. This assumption is based on two insights. First, according to RFT, prevention-focused self-regulation is characterized by a special sensitivity to negative cues. Since experiencing a violation of the reciprocity norm represents an aversive and hence negative cue, it stands to reason that prevention-focused individuals may notice and react particularly strongly and aggressively to this cue. Second, the results of Study 2 revealed that (a) prevention-focused self-regulation is associated with the endorsement of (negative) reciprocity beliefs, and (b) the endorsement of negative reciprocity beliefs is positively associated with aggressiveness. In combination, these findings lead to the hypothesis that prevention-focused individuals should be particularly likely to react with negative reciprocity to a norm violation. .

Thus, we propose that the comparatively high level of aggressiveness expressed by predominantly prevention-focused individuals' can be explained (at least in part) by prevention-focused participants' specific sensitivity to negative events such as norm violations. In particular, prevention-focus is likely to be associated with a specific sensitivity to the detection of

norm violations and with a particularly strong tendency to interpret norm violations as the outcome of intentional actions (reflecting a hostile attribution bias). Moreover, we assume that as a consequence of these tendencies, prevention-focused individuals are particularly likely to react in a hostile and aggressive manner in situations where they are confronted with a norm violation

To test our assumptions, we designed an experimental study examining the violation of a normative standard as a critical situational input factor triggering aggressiveness specifically among prevention-focused individuals. Thus, the study was designed to answer the question whether the relation between prevention-focused self-regulation and aggressiveness reflects a particular sensitivity to norm violations in prevention-focused individuals. By manipulating the experience of a norm violation, we followed a methodological strategy designed to establish a causal chain as recently discussed by Spencer, Zanna, and Fong (2005) who noted that a reasonable strategy to document a causal chain in the attempt to understand the underlying mechanisms involved in a given psychological phenomenon is to experimentally vary the proposed underlying factor (as a complementary strategy to the often applied mediational analysis based on the measurement of mediating variables).

Study 3

The considerations outlined above were tested in an experimental study involving the manipulation of a violation of the reciprocity norm and the assessment of participants' perception of norm violation, hostile attribution tendency, and level of aggressiveness as a function of chronic self-regulatory orientation. Aggressiveness was measured using both direct and displaced aggression, the latter representing a measure of actual behavioral aggression.

Method

Participants and Procedure

Seventy-seven students at the University of Mannheim ($M_{\text{age}} = 22.4$; 37 women) participated in this study and received monetary compensation (2 Euro plus extra money depending on their response in the experimental setting, see description below). They were randomly assigned to one of two experimental conditions. Four participants were excluded because they did not follow the experimental procedures adequately, leaving a sample size of 73 for subsequent analyses.

When participants arrived at the lab, a confederate of the experimenter appeared and served as the ostensible other participant so that participants were made to believe that there was another participant present with whom they would later be interacting. They were told that the other participant would be sitting in an adjacent room and completing the same material. Once seated in their cubicle, participants received a questionnaire that contained the measure of chronic regulatory focus used in Study 1 (Lockwood et al.'s scales; $\alpha_{\text{Promotion}} = .81$; $\alpha_{\text{Prevention}} = .76$)

Manipulation of norm violation. After completing the regulatory focus measure, participants received new materials from the experimenter and first read the descriptions involving the cover story for the manipulation of norm violation. The cover story explained that the researchers were interested in individuals' reactions in social interactions involving decision-making regarding money exchange.

We chose the trust game interaction paradigm that was developed by Berg, Dickhaut, and McCabe (1995) which has been frequently used in game theoretical analyses of trust (e.g., Bohnet & Zeckhauser, 2004; Buchan & Croson, 2004; Kosfeld, Heinrichs, Zak, Fischbacher, & Fehr, 2005). In this experimental game, participants initially receive a certain amount of money and learn that they can transfer any amount of this money to a second player and that this amount will be tripled before the other player actually receives the transfer amount. At this point, the other player (who receives the money) is free to decide whether or not to reciprocate by sending back a certain amount of money. In an absolute trust relationship, participants who are in the

position to initiate the money transfer would decide to send the full amount to the interaction partner, and the person receiving the money would send back half of the amount he or she received, resulting in the best possible joint outcome for the players.

In order to manipulate norm violation, we varied the level of reciprocation participants experienced in the paradigm (with a low level of reciprocity reflecting a violation of the reciprocity norm). Each participant initially received a payment of 2 Euros (in form of ten 20 Cent coins) for showing up. Participants then learned that they were randomly assigned either to the role of a money transfer initiator or the role of a transfer receiver (in reality, all participants were assigned to the role of money transfer initiator). Participants in the role of a money transfer initiator had the option to transfer any amount between 0.20 and 2 Euro to another person (the receiver), who would then decide how much money he or she wanted to send back. It was further explained that the amount of money the initiator was willing to transfer (between 0.20 and 2 Euro) would be *tripled*. That is, if the initiator decided to transfer 2 Euro, the receiver would get 6 Euro and could then decide how much of this amount he or she was willing to send back to the initiator. Participants also learned that the transfer receiver could select an amount varying in steps of 0.05 Euro (this information was necessary given that the amount of money they received in the back transfer could represent 160%, - see below - which required that the interaction partners have the option of using coins of lesser value). Moreover, participants were told that the individuals involved in the interaction would remain strictly separated and had no chance of communicating with each other.

Following the detailed description of the scenario, participants were asked to decide on the amount of money they would be willing to transfer to the receiver and to put the respective amount in an envelope provided by the experimenter, who then ostensibly brought the envelope to the transfer receiver in the adjacent room. In reality, the experimenter went to the other room, checked the amount of money the participant had put in the envelope, and selected one of several

previously prepared envelopes containing the amount of money that either reflected a repayment of 100% (for participants randomly assigned to the norm violation condition) or a repayment of 160% (for participants randomly assigned to the control condition). The amount of repayment was based on the findings of a pre-test which revealed that among students at the University of Mannheim, a repayment of 155% or higher in the trust game paradigm is perceived as fair and appropriate in terms of the reciprocity norm. The experimenter then returned to the participant with the selected envelope and an additional questionnaire containing the measures of dependent variables.

Materials

Manipulation check. First, in order to make sure that all participants had opened the envelope before responding to the dependent measures, we asked them to indicate the amount of money they had received as repayment from their interaction partner. All participants indicated the correct amount of repayment. Next, participants responded to three items designed to assess the *perceived fairness* of the repayment they had received, which served as a manipulation check of the norm violation manipulation. The fairness items read: “I felt that the return transfer from my interaction partner was fair;” “The return transfer from my interaction partner deviated strongly from what one could expect as a fair return transfer in terms of reciprocity;” “I feel that the behavior of my interaction partner was unfair” (the latter two items were reverse coded, 1 [*not at all true*] to 7 [*completely true*]). A fairness index was computed averaging across the items ($\alpha = .94$). After responding to the manipulation check questions, participants proceeded to complete the dependent measures. All measures described below were assessed on 7-point scales ranging from 1 (*not at all true*) to 7 (*completely true*).

State Anger. To assess affective reactions to the money exchange interaction, we included four items designed to assess anger. Sample items read: “The behavior of my interaction partner on this task made me angry;” “My interaction partner made me angry because he did not behave

fairly in terms of reciprocity.” We computed an anger index averaging across the four items ($\alpha = .92$).

Hostile attributions. Participants’ tendency to attribute their (ostensible) interaction partners’ behavior to mean intentions was assessed using three items that read: “I am certain that my interaction partner deliberately behaved this way so as to provoke me;” “My interaction partner deliberately behaved this way to harm me;” and, “I think that my interaction partner transferred this amount without intending me any ill will” (the latter item is reverse coded). We computed a hostile attribution index averaging across the three items ($\alpha = .76$).

State aggression. In line with previous work (Farrar & Krcmar, 2006), we used a state version of the Buss and Perry (1992) aggression questionnaire to assess state aggression. Specifically, we modified the original trait items in such a way that the statements referred to participants’ ostensible interaction partner and the current situation in the experimental session. As a lead-in-statement to the state aggression items, participants read: “Now imagine that upon leaving the room you happen to run into your interaction partner, who is holding the money he received in his hand and is laughing. Please read the following statements carefully and indicate to what extent these statements apply to your personally in this situation.” Participants responded to 20 state aggression items that measured state verbal aggression (sample item: “I would tell this person directly what I thought of his or her behavior”), state physical aggression (sample item: “This person could drive me to the point where we would get into a physical confrontation”), state anger (sample item: “In this situation I would feel like a powder keg about to explode”), and state hostility (sample item: “In this situation I would definitely think that life is treating me unfairly”). We computed a mean state aggression index averaging across the 20 items ($\alpha = .95$).

Displaced aggression. Following a procedure used by Mussweiler and Förster (2000) to assess displaced aggressive tendencies, we asked participants in the concluding part of the study

to select 10 pictures out of a set of 30 that would ostensibly be given later to participants in an unrelated future study conducted by the same research group. The 30 pictures were selected from the International Affective Picture System (Center for the Study of Emotion and Attention, 1995). These pictures have been pre-tested for their valence using rating scales ranging from 1 (*negative*) to 9 (*positive*). The set of 30 pictures used in the present study comprised 10 negative pictures with ratings below 4 (e.g., a picture of a rotting animal corpse), 10 positive pictures with ratings above 6 (e.g., a picture of three puppies), and 10 neutral pictures with ratings between 4 and 6 (e.g., a picture of a book). Participants received a poster where all 30 pictures could be seen simultaneously, as well as a pile of the 30 pictures as separate photographs. They were instructed to put the 10 selected photographs from the pile in an envelope that was provided by the experimenter. As cover story, participants learned that the research group was conducting studies in another field testing mechanisms of visual perception in social context, and that the participants in the respective studies were to receive visual stimulus materials. Moreover, participants were told that it was of great importance to ensure that the materials used in these studies represented a wide variety of stimuli and that it was important that they select the stimuli rather than the researchers, because researchers who were familiar with the study goals could introduce bias in the selection of the pictures. In other words, participants were lead to believe that their help was required to develop an unbiased set of stimuli for future studies. We used the mean valence of the 10 selected pictures as a measure of displaced aggression (lower scores reflecting higher aggression). This measure represents an indicator of actual behavioral aggressive tendencies.

Results and Discussion

In preparing the regression analyses designed to test the proposed moderation hypothesis, we first centered the prevention and promotion focus scores, standardized the norm violation variable by coding it as +1 (for the norm violation condition) and -1 (for the control condition),

and computed the interaction term by multiplying the centered prevention as well as the centered promotion scores with the norm violation variable. Results of regression analyses are reported in Table 5 separately for the manipulation check and each criterion variable.

Manipulation Check

In an initial analysis we checked the effectiveness of the norm violation manipulation and regressed responses to the *perceived fairness* items onto prevention and promotion focus scores, the categorical variable of norm violation and their interaction terms. The analysis revealed the expected norm violation main effect (perceived fairness was significantly higher in the control condition compared to the norm violation condition), as well as a main effect of habitual prevention focus (stronger endorsement of prevention focus significantly predicted lower perceived fairness). The interaction term did not reach the conventional level of significance; however the negative interactive effect at trend level is in line with the hypothesis that the norm violation is perceived as more unfair, the more prevention-focused participants are in their self-regulatory orientation.⁴

Main Dependent Measures

Next, we separately analyzed the main dependent measures by regressing them on the same predictors as above. As expected, regression results revealed the hypothesized significant interaction effect between prevention focus and norm violation for all criterion variables (anger, hostile attribution, state aggression, and displaced aggression; significant main effects for norm violation and for prevention focus scores emerged in the analyses focusing on anger, hostile attributions, and state aggression). The findings are graphically displayed in Figure 1 (based on a median split on the prevention scale scores). As is evident, scores on measures of anger, hostile attributions, and state aggression are significantly higher in the norm violation condition compared to the control condition, and, most importantly, this effect is particularly strong in individuals reporting a strong prevention-focused orientation of self-regulation. A parallel effect

emerged on the displaced aggression measure (which is reverse scored: higher scores reflect selection of pictures with more positive valence) – that is, the norm violation resulted in a stronger tendency to engage in displaced aggression as reflected in the selection of more negative/aversive pictures. This finding is particularly noteworthy, because the picture selection measure represents a measure of actual behavioral aggression.

The findings obtained in this experimental study suggest that prevention-focused self-regulation is associated with a particularly strong tendency to react angrily and aggressively in situations involving a norm violation, indicating that prevention-focused individuals seem to be most sensitive regarding norm violations. Moreover, such individuals are particularly likely to attribute hostile intentions and to react with displaced aggressive tendencies following the experience of a violation of the reciprocity norm. In combination, the results suggest that sensitivity to norm violation can be understood as a critical factor that contributes to prevention-focused individuals' higher level of aggressiveness. The fact that individuals who engage in extreme acts of violence – for example, individuals involved in homicidal rampages (such as the Virginia Tech massacre or the Columbine high school shooting) – are often found to see themselves as victims of unfair treatment (i.e., norm violations) suggests that the findings observed in our experimental study reflect one aspect of the mechanisms that are most likely involved in real world incidents of drastic acts of aggression.

General Discussion

In relating aggressiveness to RFT (Higgins, 1998), we proposed that a prevention-focused mode of self-regulation is associated with trait aggressiveness and to behave aggressively. The obtained findings strongly support this hypothesis. Across several studies, participants consistently scored higher on measures of aggressiveness, the more they endorsed a prevention-focused orientation of self-regulation. In the reported studies, we applied different measures to assess individual differences in regulatory focus and also different measures to assess trait

aggressiveness and the tendencies to act and react aggressively. The proposed relationship was observed irrespective of the type of measurement applied to assess the relevant constructs (i.e., chronic regulatory focus and aggressiveness), and it emerged in different cultural milieus (USA and Germany).

Going beyond the first generation of research (Zanna & Fazio, 1982) concerning the question whether a relationship between (prevention-focused) self-regulatory mechanisms and aggressiveness can be observed (which can be answered affirmatively based on the results obtained in Study 1 and 2), we also addressed the second-generation question focusing on underlying mechanisms. In this respect, we found evidence supporting the notion that specific aspects of prevention-focused self-regulation contribute to the observed relationship between prevention-focused self-regulation and aggressiveness. Specifically, we found that cynical hostility and rumination (reflecting a general tendency of negative thinking) as well as neuroticism and endorsement of negative reciprocity norm beliefs play an important role. We also obtained experimental evidence supporting the notion that differential sensitivity to norm violation is a crucial factor underlying the association between prevention-focused self-regulation and aggressiveness. Overall, findings suggest that negative thinking and sensitivity to norm violations play a crucial role and contribute to individual differences between prevention- and promotion-focused individuals in aggressive tendencies.

We acknowledge the fact that we are not in a position to draw conclusions regarding the causality of the observed relations and the mechanisms underlying the relation between prevention-focused self-regulation and aggressiveness given the correlational nature of the reported findings. Additional (experimental) research is clearly necessary (and currently underway in our lab) to test the causality and the underlying mechanisms of the relation between prevention-focused self-regulation and aggressiveness in a systematic fashion.

The reported research findings are innovative in several respects. First, in relating RFT to aggressiveness we document the crucial impact of self-regulatory mechanisms with regard to an important social interactive phenomenon. So far, the role of self-regulatory mechanisms has been largely neglected in the analysis of aggressiveness (cf. Bettencourt et al., 2006), and the present studies help to fill in this gap. Second, we specifically put the differential sensitivity assumption entailed in RFT to a test in the context of aggressiveness and obtained strong empirical support. We found that predominantly prevention-focused participants were particularly sensitive to the violation of a norm, and this suggests that prevention-focused individuals are particularly sensitive to and vigilant about normative standards. Since this aspect of prevention-focused self-regulation has not been documented before, the current findings extend our knowledge on the specific mechanisms characteristic of this distinct self-regulatory mode.

Third, the observation that prevention-focused participants responded with increased *displaced* aggression in a context where a norm violation was rendered salient (Study 3) is a novel and intriguing finding, which provides evidence for the role of self-regulatory mechanisms in the field of displaced (as compared to direct reactive) aggressive behavior. Our findings indicate that prevention-focused individuals are likely to show displaced aggression the more they feel that relevant norms are violated in a social context. This might contribute to our understanding of displaced aggression observed in individuals who are victims of behaviors reflecting norm violations (e.g., students who suffer from bullying; individuals who feel deprived of basic rights or who experience injustice).

Finally, the finding that the violation of the *reciprocity* norm triggers aggression reflects an innovative aspect of the current research, because this specific aversive input factor has not been systematically assessed in the context of RFT or the context of aggression. The findings provide evidence supporting the notion that experiencing a violation of the reciprocity norm is a powerful

situational input factor triggering aggressive responses, and that this is particularly true for individuals who are prevention-focused in their self-regulatory orientation. The observed relationship between prevention-focused self-regulatory orientation and sensitivity to norm violations (as well as the endorsement of the negative reciprocity norm) suggest that further analyses of prevention-focused self-regulatory mechanisms in the field of aggression focusing on these constructs seem promising.

In sum, the present work represents a new and promising approach to the study of aggressiveness and its underlying forces and mechanisms that takes into account that social interactive processes, in general, and aggression, in particular, are heavily influenced by the self-regulatory mechanisms that are guiding individuals' thoughts and behavior.

A cautionary note regarding our theoretical perspective emphasizing prevention-focused mechanisms of self-regulation seems appropriate at this point: Our focus on prevention-focused self-regulation in the present work does *not* reflect the (implicit) assumption that promotion-focused self-regulation is not related to aggressiveness. On the contrary, in the context of the GAM we suppose that certain situational and personal input factors that contribute to aggressive tendencies are likely to be related to promotion-focused mechanisms. For example, theoretical considerations suggest that frustration through interfering disruptions in the strive to reach an ideal or maximal goal – that is, a goal standard related to the promotion focus – is most likely to trigger aggression in promotion-focused individuals. Thus, it is important to note that our position is not that only prevention-focused self-regulation is related to aggressiveness, and that promotion-focused self-regulation is irrelevant in the discussion of aggressiveness. Our position is that *both* modes of self-regulation can contribute to the development and expression of aggressiveness, though they do so through very different routes and mechanisms. The present work focused on mechanisms related to the prevention focus. Additional studies focusing on mechanism related to the promotion focus are currently underway in our lab, and we posit that

the analysis of *both* orientations of self-regulation can contribute substantially to our understanding of the underlying mechanisms of aggressiveness.

In sum, the theoretical perspective and the empirical findings reported in the present paper contributes to the understanding of the role self-regulatory mechanisms play in trait aggressiveness and aggressive tendencies and thereby enhance our knowledge of the factors that contribute to aggressive behavior. As such, the current studies open a new avenue of research for studying aggression that incorporates the crucial impact of self-regulatory mechanisms.

Implications

Given the great relevance of aggression in everyday life, a discussion of several practical implications of the present work with respect to potential means for decreasing aggressiveness (particularly in prevention-focused individuals) seems appropriate. In the most general terms, our findings suggest that it would be important to counteract a misanthropic, cynical perspective (e.g., making hostile attributions) and negative thinking (e.g., rumination) in individuals. With respect to the misanthropic, cynical perspective that contributes to prevention-focused individuals' aggressiveness, it seems worthwhile to try and counteract hostile dispositional attributions by highlighting the importance of social context as a critical factor in driving individuals' behavior, and to emphasize the fact that individuals' characteristics and behaviors are malleable and subject to change. With respect to the tendency toward ruminating and negative thinking, it seems appropriate to try and counteract prevention-focused individuals' tendency to focus on negative environmental cues and related emotional experiences as well as their tendency to brood and dwell on bad and negative things. Of course, this seems a rather difficult undertaking, particularly if individuals live in a context where they are consistently confronted with negative cues. Nonetheless, recent approaches in positive psychology (Snyder & Lopez, 2002) indicate that there are possible strategies for changing individuals' focus and inducing a more hopeful and positive perspective.

Another possible strategy to counter prevention-focused individuals' aggressive tendency could be to make use of prevention-focused individuals' respect for normative standards and to emphasize that *non-aggressive* and *non-retaliatory* behavior are normatively appropriate. Based on the notion that prevention-focused individuals' are particularly concerned with fulfillment of oughts and responsibilities, such a strategy seems theoretically particularly meaningful.

Finally, given the empirical evidence documenting that being raised under an authoritarian parenting style contributes not only to the development of a prevention-focused self-regulatory orientation (Keller, in press), but also to established risk factors in the context of aggression (labile self-esteem, neuroticism, cynical hostility, hostile attribution bias), it seems that having parents consider the consequences of authoritarian childrearing practices might also be helpful. In combination, such efforts to counteract the mechanisms documented as underlying factors of aggression in the current research might prove useful in limiting and inhibiting the development and expression of aggressiveness.

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Footnotes

¹. Note that the recent meta-analysis on personality and aggressive behavior conducted by Bettencourt and colleagues (2006) revealed that irritability (reflecting trait anger), rumination, emotional susceptibility (reflecting neuroticism), and narcissism (reflecting labile self-esteem) are among those traits that are reliably related to aggressive behavior. Several lines of research have found that *neuroticism* is related to aggressiveness (Sharpe & Desai, 2001; von Collani & Werner, 2005), that (angry) *rumination* is a close correlate of aggression (Denson, Pedersen, & Miller, 2006); Bushman, 2002; Bushman, Bonacci, Pedersen, Vasquez, & Miller, 2005; Caprara, 1986; Collins & Bell, 1997; Sukhodolsky, Golub, & Cromwell, 2001; Verona, 2005), that *labile self-esteem* (narcissism) is positively associated with aggression (Baumeister, Bushman, & Campbell, 2000; Baumeister, Smart, & Boden, 1996; Bushman & Baumeister, 1998; note that labile self-esteem/narcissism is also robustly related to neuroticism, cf. Schroeder, Wormworth, & Livesley, 1994), and that *interpersonal trust* is inversely related to aggressiveness (Miller, Lynam, & Leukefeld, 2003).

². We want to emphasize that we are not making the claim that aggressiveness is exclusively related to prevention-focused self-regulatory mechanisms and that promotion-focused self-regulation is irrelevant in the context of aggressiveness. As outlined in the general discussion, we discuss that certain input factors in the GAM are conceptually linked to promotion-focused self-regulation (e.g., when individuals experience and interference in their efforts to reach ideal or maximal goals). Thus, there is reason to assume that the analysis of promotion-focused self-regulation may also contribute to our understanding of aggressiveness. However, our focus in the present article is on the role of prevention-focused self-regulatory mechanisms.

³. Note that additional analyses including positive reciprocity norm beliefs and general reciprocity beliefs as predictors revealed that these variables are not relevant, all coefficients $t < 1.10$, *n.s.*

⁴. A critical reader may be tempted to argue that an interaction effect on the manipulation check at trend level significance is a critical limitation. However, it should be noted that we are not making the claim that perceived fairness is the only relevant aspect that contributes to prevention-focused participants' increased tendency to react aggressively. As outlined in the introduction and documented in Study 1 and 2, it is much more meaningful to assume that *several* aspects related to prevention-focused self-regulation (not only the enhanced sensitivity to rule violations but also a tendency to reciprocate, a hostile attribution tendency, and the inclination to react with anger and hostility) contribute to an enhanced aggressive tendency in predominantly prevention-focused individuals. Accordingly, we think it is fair to conclude that finding an interaction effect on the manipulation check (reflecting only one of the discussed aspects) at a marginal level of significance is not a major limitation in the present context.

Table 1

Zero-order Correlations between Variables Included in Studies 1a and 1b

	Prevention	Promotion	Aggression Index	Cynical Hostility	Rumination
Prevention	-	.05	.41***	.30**	.50***
Promotion	.08	-	-.06	.14	-.18 ⁺
Aggression Index	.58***	-.04	-	.49***	.53***
Cynical Hostility	.47***	.07	.65***	-	.18 ⁺

Note: Results obtained in Study 1a are shown above the diagonal; results of Study 1b are depicted below the diagonal. ⁺ $p < .10$; * $p < .05$, ** $p < .01$, *** $p < .001$. Rumination was assessed only in Study 1a.