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Reinforcement sensitivity theory, vengeance, and forgiveness

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ABSTRACT

We examined how the behavioral inhibition system (BIS) and behavioral activation systems (BAS) predict vengefulness and forgiveness. Participants (N = 159) completed measures of BIS, BAS, vengefulness, and forgiveness of self, others, and situations. Initial regression analyses indicated that both BIS and BAS predicted vengefulness. Based on this finding, we examined whether Anxiety and Fear—components of the BIS—and three BAS subscales—Reward Responsiveness, Drive, and Fun-seeking—predicted vengefulness. Only BAS-Drive demonstrated statistically significant ability to predict vengefulness. Higher levels of BIS also predicted lower levels of self- and situational-forgiveness while BAS was not predictive. BIS and BAS did not predict other-forgiveness. The importance of modeling vengefulness and forgiveness within the context of the BIS/BAS distinction is discussed.

1. Introduction

Researchers on the Five Factor Model (FFM: Costa & McCrae, 1992)—a widely accepted descriptive taxonomy of personality—have examined whether the model's constructs covary with vengeance and failure to forgive others (see Worthington, 2006 for a review of these findings.) The FFM is a descriptive taxonomic theory that is atheoretical and does not emphasize causal determinants of personality (Costa, McCrae, & Siegler, 1999). To a lesser extent, Eysenck's Three Factor theory of personality (Eysenck & Eysenck, 1985), which does address underlying causal aspects, has also been used to examine vengeance and forgiveness (Bellah, Bellah, & Johnson, 2003; Johnson & Butzen, 2008). We believe that the next line of investigation of vengeance and forgiveness, based on the thinking of Smillie, Pickering, and Jackson (2006), is an analysis of presumed underlying causal links between personality-based individual differences and vengefulness and forgiveness. Accordingly, we have examined whether Reinforcement Sensitivity Theory (Gray, 1982, 1987, 1990) helps to understand at a deeper level vengeance, and forgiveness of self, others, and situations in interpersonal transgressions.

2. Reinforcement Sensitivity Theory

From its beginnings, Reinforcement Sensitivity Theory (RST: summarized by Gray (1987, 1991) was described as a biobehavioral model of personality building upon Eysenck (1967). RST describes three interactive systems: the behavioral inhibition system (BIS), the behavioral activation system (BAS), and the fight-flight system (FFS). The apparent power of RST is its motivational focus; it addresses underlying etiologies of personality and behavior, and specifically addresses appetitive and aversive motivational systems that contribute to behavior and stable personality traits (Depue & Collins, 1999; Gray, 1990). This contrasts with taxonomic approaches (such as the FFM) which are descriptive and do not purport to address etiology of personality and behavioral processes.

RST has been refined by Gray and McNaughton (2000) and McNaughton and Gray (2002), and summarized by Corr and McNaughton (2008). (The reader is referred to these sources for a more in-depth discussion of current RST conceptualizations.) The current study is based on the original RST conceptualization. However, Heym, Ferguson, and Lawrence (2008) found that measured BIS includes the two factors of BIS-Anxiety and BIS-FFFS Fear, and we included these newer concepts in our study.

2.1. Behavioral inhibition system

The BIS is mediated by the periaqueductal grey, medial hypothalamus, amygdala, septo-hippocampal system, posterior cingulated, and prefrontal dorsal stream biological systems (Gray & McNaughton, 2000; McNaughton & Corr, 2004). The BIS, which underlies susceptibility to anxiety, is activated by conflict. According to Gray, BIS mediates the experience of anxiety in response to aversive or surprising environmental cues. BIS activation serves to inhibit movement toward goals due to its sensitivity to signals of punishment, lack of reward, and novelty. BIS activation also relates

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to negative feelings such as fear, frustration, and sadness (Gray, 1981, 1987, 1990).

2.2. Behavioral activation system

The second system of personality postulated by Gray (1990) is that of the behavioral activation system (BAS), mediated by basal ganglia, dopaminergic fibers ascending from the substantia nigra and ventral tegmental area to innervate the basal ganglia, and the motor, sensorimotor, and prefrontal cortices. BAS activation promotes increased movement towards goals, secondary to reward cues, non-punishment, and escape from punishment. BAS activation is also reflected in the experience of positive emotions such as hope, happiness, and elation (Gray, 1981, 1990). Hence, the BIS is generally implicated in negative emotions and the BAS in positive emotions.

Since we currently lack adequate measures of the FFS (cf. Smillie et al., 2006), the present study is primarily limited to the BIS and BAS systems. However, Heym et al. (2008) found a two-factor solution for items measuring BIS which they described as BIS-Anxiety and FFFS-Fear (which addresses responsiveness to punishment). Accordingly, we initially examined BIS and then provide information on these two additional aspects of BIS in modeling vengefulness.

3. BIS/BAS, vengefulness and forgiveness

The area of vengefulness and the related construct of forgiveness in response to interpersonal transgressions represents a fruitful area to examine within the context of the BIS/BAS distinction. Since an interpersonal transgression represents an aversive environmental stimulus that is typically rife with conflict, it is likely that individual differences in BIS/BAS may mediate responses such as vengefulness and forgiveness to such transgressions. Further, vengefulness and forgiveness have been examined through the Three- and Five Factor Models of personality, which have known relations with the BIS/BAS systems (cf. Heym et al., 2008; Smits & Boeck, 2006). Hence, it is logical to extend factor-based findings to RST and forgiveness.

Vengefulness is different from aggression and anger since it specifically relates to voluntary aggression in response to an interpersonal offense. We defined vengefulness as "an attempt to redress an interpersonal offense by voluntarily committing an aggressive action against the perceived offender" (McCullough, Bellah, Kilpatrick, & Johnson, 2001, p. 602). Vengefulness contains both vengeful and avoidant thoughts and behaviors (McCullough et al., 1998).

For those higher in BIS sensitivity, it is likely the anxiety and fearfulness subsequent to experiencing an offense would serve to inhibit vengeful behavior. However, BIS sensitivity has been associated with anger (Smits & Kuppens, 2005). Hence, we expected BIS to be predictive of offense-related vengefulness presumably related to anger, but the directionality of this relationship was uncertain.

Individuals higher in BAS sensitivity tend to be higher in aggressive tendencies (Carver, 2004; Harmon-Jones, 2003) since aggressive behavior is appetitively motivated and can serve as a vehicle for gaining relief and satisfaction (Gray, 1987). BAS activation has also been implicated in anger and its expression (Cooper, Gomez, & Buck, 2007; Smits, 2005). Therefore, we hypothesized that those higher in BAS sensitivity would exhibit greater propensity towards vengeful behavior.

We also examined the contributions of BIS/BAS to self-, other-, and situational-forgiveness. Forgiveness processes have been conceptualized in a variety of ways (e.g. McCullough, Pargament, & Thoresen, 2000). We used the definition of dispositional forgiveness offered by Thompson et al., (2005): "The framing of a perceived transgression such that one's responses to the transgressor, transgression, and sequelae of the transgression are transformed from negative to neutral or positive. The source of a transgression, and therefore the object of forgiveness, may be oneself, another person or persons, or a situation that one views as being beyond anyone's control such as "an illness, "fate", or a natural disaster." (p. 318). Specifically we were interested in how the BIS/BAS systems related to lack of self, other, and situational-forgiveness.

Higher BIS sensitivity is likely associated with decreased propensity for self-forgiveness. Cooper et al. (2007) found that BIS significantly predicted the constructs of Self-Aggression and Anger-in, and Mauger et al. (1992) found that lack of self-forgiveness was related to "intropunitive", or self-denigrative tendencies. Further, BIS is strongly related to Neuroticism (Gray, 1970, 1987; Gomez, Cooper, & Gomez, 2000; Heym et al., 2008; Smits & Boeck, 2006), and higher Neuroticism has a well-established relation to lack of self-forgiveness (Johnson & Butzen, 2008; Maltby, Macaskill, & Day, 2001). Therefore, we hypothesized BIS would be strongly predictive of lack of self-forgiveness. We did not expect BAS to be predictive of self-forgiveness.

The hypothesized role of BIS and BAS in other and situational-forgiveness is less clear. Other-forgiveness is relational secondary to an offense, while items measuring situational-forgiveness refer to unpleasant and uncontrollable situations. For those with heightened BIS sensitivity, forgiveness of others and situations may be challenging since an individual may be anxious about the hurtful and potentially damaging internal feelings and interpersonal context. This anxiety and apprehension may lead the offended individual to avoid any further anxiety-producing stimuli. Such anxiety-driven avoidance may decrease opportunities for the interpersonal context that allows forgiveness processes and corrective experiences to occur. Although BIS likely relates to forgiveness of others and situations, the precise nature of this relation is uncertain.

The BAS components of Drive, Fun-seeking, and Reward-responsiveness address approach behavior to potentially rewarding stimuli. Forgiveness of others and situations depends upon the context such as the nature of the relationship (cf. McCullough et al., 1998), severity of the offense (Girard & Mullet, 1997), and offender apologies (McCullough, Worthington, & Rachal, 1997). Hence, forgiveness of others and situations likely varies in terms of individual reward value, and there exist opportunities for both approach and non-approach behaviors. It is therefore uncertain how BAS or its subscales would relate to such instances of forgiveness.

In summary, we hypothesized the following: 1. Both BIS and BAS would be predictive of vengefulness; the directionality of BIS is exploratory and BAS would have a positive relationship to vengefulness; 2. BIS would be significantly and inversely predictive of self-forgiveness, and BAS not predictive. 3. The contributions of BIS and BAS to other and situational-forgiveness is exploratory.

4. Method

4.1. Participants

After the university Human Subjects Review Board approved the research prospectus, participants were recruited by advertisements via online blogs, forums, and social networking websites (details from the author). In addition to advertising online, participants were recruited from students through use of a local university list-serve. Furthermore, university faculty research team