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# Personality traits of the behavioural approach and inhibition systems: associations with processing of emotional stimuli

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## Abstract

This study examined the relationships of the traits associated with Gray's behavioural approach system (BAS) and behavioural inhibition system (BIS) with cognitive processing of emotional information. Initially, participants completed questionnaires covering trait impulsivity and anxiety, and BAS and BIS sensitivities. They were then tested individually. After completing a questionnaire of current positive and negative moods, they completed three tasks measuring processing of pleasant, unpleasant and neutral information. Consistent with Gray's theory, the results showed that impulsivity and BAS sensitivity were associated with the processing of pleasant information, while anxiety and BIS sensitivity were associated with the processing of unpleasant information. These findings imply that Gray's BAS–BIS theory can be extended to cognitive processing of emotional information. © 2002 Elsevier Science Ltd. All rights reserved.

*Keywords:* Gray's theory; Trait anxiety; Trait impulsivity; BIS and BAS Sensitivities; Emotional stimuli processing

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Gray (1970, 1981, 1987) has proposed a biological model of personality, involving a behavioural approach system (BAS) and a behavioural inhibition system (BIS). These systems have in turn been associated with positive and negative affect, respectively (Gray, 1970; Tellegen, 1985; Watson, Wiese, Vaidya, & Tellegen, 1999). Numerous studies that have examined the factors associated with cognitive processing of emotional stimuli (or stimuli that have emotional content) have shown that individuals preferentially process emotional stimuli that are congruent in emotional tone with their current mood state (mood-congruency hypothesis; Bower, 1991). More recently, studies have shown that individuals also preferentially process emotional stimuli that are

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congruent in emotional tone with their stable personality traits (trait-congruency hypothesis; Rusting, 1998). Viewed in the context of Gray's theory, the mood-congruency and trait-congruency hypotheses raise the possibility that the personality "traits" thought to be associated with the BAS and the BIS would be useful predictors of selective processing of pleasant and unpleasant emotional information. At present, this area has received little empirical attention. A major aim of this study was to examine how traits that have been linked to the BAS and the BIS predict selective processing of pleasant and unpleasant emotional stimuli.

As already noted, one approach towards understanding cognitive processing of emotional information has been the mood-congruency hypothesis (Bower, 1991; Rusting, 1998). The mood-congruency hypothesis suggests that a positive mood state will be associated with bias for more pleasant perception, attention, interpretation and judgment of emotional information, and also recall of more pleasant materials from memory. In contrast, a negative mood state will be associated with bias for more unpleasant perception, attention, interpretation and judgment of emotional information, and also recall of more unpleasant materials from memory. A major theory that has influenced the mood-congruency hypothesis is Bower's (1981, 1991) network theory of affect. According to this theory, an emotion is represented by a corresponding emotion node. An emotion node is basically a cognitive network composed of memories and cognitions related to that particular emotion. The theory suggests that activation of a particular emotion node, by the relevant emotion, will evoke emotion-related attention, perception, memory, interpretation, and judgment.

Existing data do indeed provide strong support for mood-congruency effects (Blacey, 1986; Bower, 1991; Rusting, 1998). Many of the studies in this area have used memory tasks, involving free recall of previously presented stimuli (e.g. words) varying in emotional content. Consistent with the mood-congruency hypothesis, such studies have generally shown that when positive mood was induced, individuals recalled more pleasant than unpleasant stimuli, and when negative mood was induced, they recalled more unpleasant than pleasant stimuli (Bower, Gilligan, & Monteiro, 1981; Bower & Mayer, 1989; Clark & Teasdale, 1985; Laird, Wagener, Halal, & Szegda, 1982; Nasby, 1994). Mood-congruent effects have also been examined on the basis of interpretation of emotionally ambiguous stimuli (incomplete words, stories, and pictures). Such studies have generally shown that, with positive mood induction, individuals rated ambiguous (and also pleasant and unpleasant) stimuli as more pleasant. With negative mood induction, individuals rated ambiguous (and also pleasant and unpleasant) stimuli as more unpleasant (Rule, Taylor, & Dobbs, 1987; Rusting & Nolen-Hoeksema, 1998; Weintraub, Segal, & Beck, 1974). Similarly, when people were presented with a word or letter of a word and asked to respond with the first word that came to their mind, individuals in a positive mood provided more positive valenced words, and those in a negative mood provided more negative valenced words (Mayer & Hanson, 1995; Mayer, McCormick, & Strong, 1995; Mayer & Volanth, 1985). Also, individuals in a positive mood overestimated the probability of positive life events, while individuals in a negative mood overestimated the probability of negative life events (Johnson & Tversky, 1983; Wright & Bower, 1992).

It has already been noted that another approach for understanding the cognitive processing of emotional information is the trait-congruency hypothesis. This hypothesis suggests that emotional processing is influenced by certain personality traits. Such traits are thought to predispose individuals to process information that is congruent with the traits (Bargh, Lombardi, & Higgins,

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