

Research report

Reward and punishment sensitivity in dysfunctional eating and hazardous drinking women: Associations with family risk

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Abstract

Biologically based personality traits such as reward and punishment sensitivity, and family factors, such as maternal dysfunctional eating and parental alcohol abuse, have been linked to hazardous drinking and disordered eating. However, specific relationships between personality and family factors in the development of these disorders are still unclear. A total of 443 women completed measures of reward and punishment sensitivity, family environment, maternal eating and parental drinking. Reward sensitivity was directly associated with both dysfunctional eating and drinking. Punishment sensitivity was associated with dysfunctional eating but not hazardous drinking. Punishment sensitivity mediated a chaotic family environment and daughters' dysfunctional eating. It is suggested that reward and punishment sensitivity are key traits to examine when investigating vulnerability to risky behaviour. Future research into disordered eating is likely to be advanced by an active search for mediators and moderators of family risk.

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Introduction

There is now a considerable body of evidence finding high levels of impulsivity in women who abuse alcohol, and in women with disordered eating, particularly those women whose eating patterns are characterised by binge eating (Dawe & Loxton, 2004; Nederkoorn, Van Eijs, & Jansen, 2004). Both binge eating and chronic alcohol abuse are characterised by compulsive approach behaviour. This is accompanied by a sense of loss of control following exposure to binge food/drink cues, suggesting a strong approach response in light of food and alcohol cues (Carter & Tiffany, 1999; Staiger, Dawe, & McCarthy, 2000). It has been proposed that a hypersensitivity to reward may be a common vulnerability to both disorders (Davis & Claridge, 1998; Loxton & Dawe, 2001). Elevated levels of trait anxiety have also been found in women with eating disorders (Fassino et al., 2002). The combination of high impulsivity/approach and trait anxiety/inhibition is in

accordance with the binge–purge cycle in which food cravings and loss of control of eating alternate with periods of restrictive eating and avoidance of “forbidden foods” (Klump, McGue, & Iacono, 2002). The relationship between an anxious temperament and alcohol misuse is far less clear-cut. For example, in some samples, low trait anxiety has been found related to an increased risk of alcohol misuse (e.g., Franken & Muris, 2006; Masse & Tremblay, 1997). Yet, in other samples, high trait anxiety has been found to be related to alcohol problems (e.g., Pidcock, Fischer, Forthun, & West, 2000). Despite these disparate results, the vast majority of studies have not found an association between trait anxiety and alcohol misuse (Franken, Muris, & Georgieva, 2006; Grau & Ortet, 1999; Johnson, Turner, & Iwata, 2003; O'Connor & Colder, 2005).

Jeffrey Gray's biologically based theory of personality, Reinforcement Sensitivity Theory (RST; Gray & McNaughton, 2000), has been proposed as a useful model in understanding dysfunctional eating behaviour (Dawe & Loxton, 2004). RST consists of 3 motivational systems underlying individual differences in the tendency to

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approach appetitive stimuli and avoid aversive stimuli. The Behavioural Approach System (BAS) underpins individual differences in detecting and approaching rewarding stimuli. At the personality level this is referred to as Sensitivity to Reward. Individual differences in detecting and inhibiting behaviour in light of punishment reflects activation of 2 inter-related systems, the Fight, Flight, Freeze System (FFFS), which is sensitive to aversive stimuli, and the Behavioural Inhibition System (BIS), which is activated in approach-avoidance conflicts. Although representing 2 systems at the conceptual and biological levels, at the personality level individual differences in these 2 systems are referred to as “sensitivity to punishment” (Gray & McNaughton, 2000).

The underlying neural pathways (primarily mesolimbic dopaminergic pathways) involved in reward sensitivity are those that are involved in the reinforcing effectiveness of drugs of abuse, food, sex and other naturally rewarding activities (Fowles, 2001). Thus, it is not surprising that recent studies using specific measures of Gray’s RST have found positive associations between reward sensitivity and dysfunctional eating and alcohol misuse (Davis, Strachan, & Berkson, 2004; Franken & Muris, 2005; Knyazev, Slobodskaya, Kharchenko, & Wilson, 2004; Loxton & Dawe, 2001). Additionally, Gray’s punishment sensitivity reflects inhibited behaviour under potentially punishing conditions. Those individuals with eating disorders tend to be characterised by periods of restrictive eating and associated with fear of negative evaluation. Again, punishment sensitivity has been found to be associated with dysfunctional eating (Loxton & Dawe, 2001; Nederkoorn et al., 2004). Thus, RST appears to be a useful framework from which to study these 2 disorders.

Although individual differences in sensitivity to reward and punishment appear to be fruitful factors to further understanding the risk for disordered eating and alcohol misuse, personality traits are unlikely to be sole determinants in the development of disordered behaviour (Claridge & Davis, 2003). There is converging evidence that family factors influence the expression of both eating disorders and alcohol use problems. For example, women with Bulimia Nervosa/Binge-Eating Disorder describe their families as high in conflict, criticism and overprotectiveness, and low in cohesion, empathy and emotional warmth (Hodges, Cochrane, & Brewerton, 1998). Such family dynamics are similar to those reported by individuals with other psychiatric disorders, including substance abuse (Fairburn, Welch, Doll, Davies, & O’Connor, 1997). Thus, a dysfunctional family environment appears to be a relatively non-specific risk predisposing an individual to experience psychological problems. Other family factors found to be more specific risk factors in the development of dysfunctional eating include maternal disordered eating and parental attitude to appearance and weight (Fairburn et al., 1997; Laliberte, Boland, & Lechner, 1999). Similarly, parental alcohol problems have been consistently associated with alcohol problems in their children (Rhee et al., 2003).

However, not all children who come from at-risk families develop problems themselves. Other factors, such as personality, are likely to mediate or moderate parental pathology and family environment. Polivy and Herman (2002) have raised the question as to the exact mechanisms involved in the familial transmission of disordered behaviour. It is possible that personality traits act as pathway variables between dysfunctional family environments and disordered behaviour (i.e., personality mediates family risk). For instance, trait anxiety has been proposed as a potential mediating variable between a chaotic family environment and dysfunctional eating and hazardous drinking in young adults. College women from a chaotic family have been found to be more harm avoidant, and in turn, more likely to abuse alcohol and engage in dysfunctional eating (Pidcock et al., 2000). The authors suggested that exposure to a stressful family background (e.g., parental alcohol abuse and/or a dysfunctional family environment) increases sensitivity to potential threat in the environment, and that alcohol and other substances may be used to alleviate elevated anxiety. Likewise, parental alcohol abuse has been found to be associated with environmental stress and increased adolescent negative affect, which in turn, was predictive of greater substance misuse (Chassin, Curren, Hussong, & Colder, 1996). However, no studies have tested whether heightened anxiety (i.e., punishment sensitivity) mediates a family history of disordered eating and daughters’ disordered eating.

Children of parents with alcohol problems, or from a dysfunctional family environment report higher levels of impulsiveness, and in turn, report greater drug and alcohol use and abuse (Sher, Walitzer, Wood, & Brent, 1991). Given the biological basis of reward sensitivity, and the heightened impulsivity in children of parents with alcohol problems, reward sensitivity may also act as a family-transmitted vulnerability to misuse alcohol and other reinforcing substances, such as dysfunctional eating. Again, no study has investigated whether impulsivity (i.e., reward sensitivity) mediates maternal dysfunctional eating and daughter’s dysfunctional eating.

Alternatively, personality may moderate the relationship between a positive family history and the development of dysfunctional eating or alcohol problems. For instance, although having a family background in which there is an emphasis on weight and appearance has been found to be associated with an increased likelihood of disordered eating in daughters, anxious women from such families have reported a greater level of dysfunctional eating than non-anxious women (Davis, Shuster, Blackmore, & Fox, 2004). Likewise, impulsive, novelty-seeking men and women with dysfunctional family histories have been found to be at even greater risk for alcohol-related problems than low impulsive men and women from similar backgrounds (Sher, Trull, Bartholow, & Vieth, 1999). However, with the exception of Davis, Shuster et al. (2004), no other study has looked at possible interactions between impulsivity/anxiety and maternal eating on daughter’s eating.

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