

# The relationship between the Biosocial Model of Personality and susceptibility to emotional contagion: A structural equation modeling approach

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## Abstract

Using structural equation modeling, the present study investigated the influences of personality, measured by the Temperament and Character Inventory, on susceptibility to emotional contagion, measured by the Emotional Contagion Scale (ECS), in a sample of 423 Swedish university students. Consistent with predictions of the Biosocial Model of Personality and the theory of emotional contagion, reward dependence influenced all basic emotion facets (anger, fear, sadness, happiness, and love) measured by the ECS, and harm avoidance influenced susceptibility to anger and fear, while the temperament dimensions of novelty seeking and persistence had no influence on susceptibility to emotional contagion. Among the character dimensions, self-directedness influenced susceptibility to positive emotions (happiness and love), while cooperativeness and self-transcendence had negative influences on susceptibility to anger and love (cooperativeness) and sadness (self-transcendence). The relation between susceptibility to emotional contagion and the behavior maintenance system proposed by the Biosocial Model of Personality is discussed.

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## 1. Introduction

Emotion is central to many trait approaches to personality. Like personality, emotion is considered to operate at a biological level, directing the person toward specific perceptions, cognitions, and behavior responses (Cloninger, 1987; Malatesta, 1988; Svrakic, Przybeck, & Cloninger, 1992). Therefore, personality can be seen as the tendency to experience and express certain emotions (Goldsmith, 1994), and in this regard, personality and emotion may serve a similar function in regulation of social interactions (Plutchik, 1997).

Social interaction ultimately depends on communication, and specialized nonverbal expressions have evolved

that communicate emotions (Buck, 1984; Darwin, 1998). These expressions can evoke emotions in others, which are equal to the emotions expressed by the sender. Such convergence of emotionally uniform states is assumed to direct functional behaviors that regulate social interactions (Hatfield, Cacioppo, & Rapson, 1994).

Hatfield and colleagues (1994) call this process *emotional contagion* and propose that it occurs as people attend to others, when they automatically mimic the others' momentary emotional expressions and synchronize their facial, vocal, postural, and instrumental expressions, and as a consequence, converge emotionally. Hence, emotional contagion operates through different nonverbal channels and research has demonstrated that a broad range of facial (Lundqvist, 1995; Lundqvist & Dimberg, 1995) and vocal expressions (Hatfield, Hsee, Costello, Weisman, & Denney, 1995; Hietanen, Surakka, & Linnankoski, 1998) are contagious.

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Emotional contagion represents a specific outcome of emotional regulation in social interactions. For instance, the feeling of anger in response to another person's expression of wrath is an example of emotional contagion, while a response of fear in the same situation is not. Susceptibility to emotional contagion concerns the regulation characteristics of the emotional system in terms of readiness to converge towards the emotions expressed by others.

To measure individual differences in susceptibility to emotional contagion, the Emotional Contagion Scale (ECS) has been developed (Doherty, 1997). The ECS includes the five basic emotions of anger, fear, sadness, happiness, and love. By means of confirmatory factor analysis, its five-factor structure (Lundqvist, 2006) and measurement invariance across gender and cultural groups (Lundqvist & Kevrekidis, *in press*) has been demonstrated.

Hatfield and colleagues (1994) suggest that personality, genetic heritage, and early experience predispose some people to be more susceptible to emotional contagion than others. Those in particular who are emotionally attentive, able to decode emotions, interrelated or attached to others, imitative, sensitive to interoceptive cues and emotionally reactive should be biased to catch others' emotions. Thus, susceptibility to emotional contagion is proposed to have both social and biological bases. Interestingly, this theory coincides well with Cloninger's Biosocial Model of Personality (Cloninger, Svrakic, & Przybeck, 1993). In Cloninger's model, automatic, preconceptual responses to perceptual stimuli reflect biases in information processing (temperament) and response biases related to conceptual significance and salience of perceived stimuli (character). Thus, an investigation of the influence of personality on susceptibility to emotional contagion should preferably be based on Cloninger's Biosocial Model.

### 1.1. *The Temperament and Character Inventory*

The Biosocial Model of Personality, operationalized in the Temperament and Character Inventory (TCI) (Cloninger, Przybeck, Svrakic, & Wetzell, 1994), consists of four fundamental dimensions of temperament that refer to automatic emotional responses to experiences that are genetically independent and stable throughout life, and three dimensions of character referring to goals and values that are socioculturally influenced and that mature throughout life.

The four temperament dimensions comprise novelty seeking, which reflects behavioral activation and dispositions towards being impulsive, exploratory, and quick-tempered; harm avoidance, which is related to behavioral inhibition and biases towards being generally cautious, highly responsive to threats, and inhibited in most social situations; reward dependence, which reflects behavior maintenance and disposition towards being sociable, sensitive to social cues, and easily influenced by other people's feelings; and persistence, which previously was included in the reward dependence dimension, and which reflects

behavior maintenance in terms of tenacity and is manifested as dispositions towards being industrious and hard-working. The three character dimensions included in the model consist of self-directedness, which reflects an autonomous self-concept and disposition towards being goal-directed, productive, and self-confident; cooperativeness, which accounts for empathy, compassion, and identification with and acceptance of others; and, finally, self-transcendence, which is related to individualism, spirituality, and experiences of being part of a unified whole (Cloninger, 1986, 1987, 1988; Cloninger et al., 1994).

### 1.2. *Relationship between the Temperament and Character Inventory and measures of mood and emotion*

The TCI has generally been used in research investigating the relationship between personality and mood. Most notably, harm avoidance has been found to be associated with anxiety and depression (see, e.g., Jylhä & Isometsä, 2006; Marijnissen, Tuinier, Sijben, & Verhoeven, 2002; Stewart, Ebmeier, & Deary, 2005; Svrakic et al., 1992). Particularly, high harm avoidance in connection with low self-directedness is indicative of depressive mood (Cloninger, Svrakic, & Przybeck, 2006; Peirson & Heuchert, 2001; Richter, Polak, & Eisenmann, 2003). High novelty seeking and low cooperativeness has been related to hostile mood (Svrakic, Przybeck, Whitehead, & Cloninger, 1999). Reward dependence has been related to positive mood (Svrakic et al., 1999; Zelenski & Larsen, 1999), as has persistence (Zelenski & Larsen, 1999), which in addition has been found to be negatively related to depressive mood (Cloninger et al., 2006). Less is known about self-transcendence, although some indications of a positive relationship with concurrent depressive mood have been reported (Cloninger et al., 2006).

In sum, previous research based on the Biosocial Model of Personality gives evidence for a relationship between mood and personality traits. However, given the importance of personality and emotion in interpersonal relations (see, e.g., Cloninger, 1986, 1987, 1988; Goldsmith, 1994; Hatfield et al., 1994), knowledge of the relationship between personality and susceptibility to emotional contagion is greatly lacking.

### 1.3. *The present study*

The present study aims to examine the influence of temperament and character factors on susceptibility to emotional contagion. On the basis of Hatfield's theory of emotional contagion, Cloninger's Biosocial Model of Personality and prior empirical results mentioned above, it was hypothesized that reward dependence and cooperativeness should be the chief dimensions influencing susceptibility to emotional contagion, while novelty seeking and harm avoidance were assumed to mainly influence susceptibility to facets of negative emotions. With regard to persistence, self-directedness, and self-transcendence, previous research

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