

Research report

The role of temperament and social support in depressive symptoms: A twin study of mid-aged women

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Abstract

Background: Although research has found that temperament and social support are associated with depression, these relationships have not been explored in conjunction with one another as they relate to depression using a genetically informative design. This study investigated how the association among the three constructs is mediated.

Methods: The sample in this study consisted of 326 pairs of adult monozygotic and dizygotic twins drawn from the Swedish Twin Registry. Twins were mothers of adolescent from married or partnered relationships. The genetic and environmental contributions to the association were evaluated by self-reported measures of temperament, social support, and depressive symptoms.

Results: Multivariate genetic model fitting revealed that a moderate portion of genetic influences were common among the three central constructs of harm avoidance, perceived social support, and depressive symptoms.

Limitations: The results may not be generalizable to depressive disorders in clinical settings. The measures were self-reported from a cross-sectional study.

Conclusions: The findings suggest that the heritable component may contribute to genetic influences on an individual's ability to secure social support and thus to genetic risk for depressive symptomatology in women.

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1. Introduction

Researchers have recognized that depression is associated with interpersonal social contexts. For example, deficient social support has been identified as a crucial risk factor for depression and depressive symptoms. One ex-

planation for these observed genetic and nonshared environmental influences on the relationship between social support and depressive symptoms is that temperament may account for both the capability to establish social support, as well as the vulnerability to depression. For example, in the psychobiological model of personality development proposed by Cloninger et al. (1993), individuals who scored high on harm avoidance were more likely to fear uncertainty, worry about the future, shy away

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from unfamiliar people or situations, and fatigue easily. A growing body of literature suggests that temperament is associated with depression and depressive symptoms and that social support can serve as a mediator of the effects of temperament on depressive symptoms (Finch and Graziano, 2001; Ghazinour et al., 2003; Windle, 1992).

Although there is evidence that temperament and social support systems are associated with depression, these associations have not been investigated using a genetically informed design. One potential source of the association among temperament, social support, and depressive symptoms is genetic influences. That is, genetic effects on temperament may also explain genetic effects on social support and depressive symptoms. Genetic factors that influence an individual's temperament may directly manifest as genetic vulnerability to depression. Alternatively, given that gene expression for depression is likely to be a complex process facilitated through environmental agents, temperament may be indirectly associated with depression in part as a consequence of its effect on social relationships. Another potential source of such association could be shared environmental mechanisms that make siblings in the same family similar. This means that shared environmental influences that influence temperament, may also influence the development of social support systems and depression. Lastly, nonshared environmental influences, those nongenetic factors that make family members different from one another may favor the development of these risk factors, and later, developmental outcomes. For adults, unique social systems such as marriage seem likely to be influential in explaining this association (Spotts et al., 2004).

Previous twin and family studies have been relatively consistent in finding substantial genetic and nonshared environmental influences on depressive symptoms (Kendler et al., 1994; McGue and Christensen, 1997). There has been some research on the associations between social support and depressive symptoms using genetically sensitive designs, as well as between temperament and depressive symptoms. Both sets of studies have found evidence for possible genetic mechanisms linking these risk factors to depressive symptoms (Bergeman et al., 1991; Bergeman et al., 2001; Farmer et al., 2003; Kessler et al., 1992). For example, one of the few studies to examine the association between social support and depression found that genetic factors explained 65% of the covariance between perceived support and depression, whereas nonshared environmental factors explained 35% of the covariance (Bergeman et al., 1991). In an effort to extend this line of research, the present study uses a biometric model for the association of these risk factors and depressive symptoms simultaneously, by further

clarifying genetic and environmental contributions to the association. This study addresses a specific question: Do the same genetic and environmental influences explain the associations among temperament, social support, and depressive symptoms in middle-aged women? By building upon previous research, we expected that genetic influences are common to all three constructs, meaning that genetic influences on temperament will also be shared with genetic influences on depressive symptoms and with social support systems. The present study does not address the causal relationships among the three central constructs; however, it does examine how the association among the three constructs is mediated. The efforts clarifying underlying genetic and environmental mechanisms could expand our knowledge of depressive symptoms and assist in the development of interventions by addressing interpersonally mediating processes.

2. Methods

2.1. Participants

The participants consisted of 326 pairs of adult female twins (150 MZ twin pairs; 176 DZ twin pairs) from the Twin Mothers Study, a subsample of the Swedish Twin Registry. Details regarding the Swedish Twin Registry can be found in Lichtenstein et al. (2002). Each twin was required to have an adolescent child (mean child age = 15.4 ± 2.2 years) who was of the same sex and who had less than 4 years difference in age from her co-twin's child. The average age of the twin mothers was 44 ± 4.49 years (with a range of 32 to 54 years). A total of 613 couples were married and 39 couples were cohabiting; cohabitation is a common alternative to marriage in Sweden and no differences between these two groups were found. All married and cohabiting couples were required to have lived together for at least 5 years. Zygosity was determined by DNA analysis and responses to the question: "During childhood, were you and your twin sibling as similar as two berries?" The MZ and DZ twins were not significantly different in characteristics including age, occupation, education level, age of partner, or biological relationship to child. Details are provided in Reiss et al. (2001a,b).

2.2. Measures

2.2.1. Temperament

Temperament was assessed according to the temperament dimension of the Temperament and Character Inventory (TCI; Cloninger et al., 1993), which comprises 125 items. The temperament dimension consisted of

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