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The interaction between temperament and the family environment in adolescent substance use and externalizing behaviors: Support for diathesis–stress or differential susceptibility?

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ABSTRACT

Both individual and environmental factors predict externalizing behaviors and substance use (EB-SU); however, different patterns of interaction among these factors may have different implications. This review first examines how temperament and the family environment interact in the prediction of adolescent EB-SU. Second, studies are reviewed according to two theoretical models: (1) diathesis–stress, i.e., certain individual characteristics are linked to vulnerability and later problems in adverse environments; (2) differential susceptibility, i.e., these characteristics are linked to susceptibility, predicting problems in adverse environments, but *also* better than average outcomes in good environments. Fourteen studies focusing on the prediction of EB-SU at ages 12–18 were selected through a literature search. Results showed that certain temperament traits (high levels of impulsivity and disinhibition; low levels of effortful control, negative affect, fearfulness and shyness), hereby designated as “adventurous” disposition, were associated with higher levels of EB-SU in adverse family environments. Some studies also showed that children with “adventurous” temperament traits in positive environments had the lowest levels of EB-SU. This suggests that

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prevention of EB-SU might target family factors such as parenting and focus on children with “adventurous” temperament traits. Further, studies that supported the differential susceptibility model were those assessing temperament and the family environment in childhood and studies that supported the diathesis–stress model assessed these variables in adolescence. It is thus possible that some of these “adventurous” temperament traits, with regard to EB-SU, would be indicators of susceptibility to both enriched and adverse environments in childhood but no longer in adolescence, when they would only be indicators of vulnerability to adverse environments.

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Adolescent substance use has several adverse short- and long-term consequences, including addiction, poor academic achievement, sleep disturbances, depression, suicidal behavior, injuries, overdoses, car accidents, teenage pregnancy, sexually transmitted diseases and liver disease (Newbury-Birch et al., 2009; Single, Rehm, Robson, & Van Truong, 2000; Stolle, Sack, & Thomasius, 2009). Correlates of substance use in adolescence include both individual and environmental characteristics (Chartier, Hesselbrock, & Hesselbrock, 2010; Patrick & Schulenberg, 2013). While internalizing problems are more strongly associated with substance use in adulthood (Chan, Dennis, & Funk, 2008; Grant et al., 2004; King, Iacono, & McGue, 2004), a history of externalizing behaviors beginning in early childhood is more likely to be observed in adolescents using substances (Chan et al., 2008; Jester et al., 2008; Pingault et al., 2013; Zucker, Heitzeg, & Nigg, 2011). Furthermore, since adolescent substance use and externalizing behaviors share common variance and developmental predictors (Castellanos-Ryan & Conrod, 2011; Castellanos-Ryan et al., 2014; Krueger, Markon, Patrick, Benning, & Kramer, 2007; Vrieze, Perlman, Krueger, & Iacono, 2012), substance use may be considered a form of externalizing behavior. Thus, examining the predictors of adolescent externalizing behaviors can also provide insights into the development of substance use problems.

Two sets of predictors reflecting the child’s early predisposition and its environment have shown promise in understanding the development of externalizing behaviors and substance use. Most researchers agree that temperament consists of individual differences in behavior-influencing traits which appear early, are relatively stable across situations and time, and are thought to have some biological foundation (De Pauw & Mervielde, 2010; Goldsmith et al., 1987; Henderson & Wachs, 2007; Rothbart & Bates, 2006; Shiner et al., 2012). Historically, temperament research has allowed to study the potential influence of children’s early characteristics to their social development and began after the publication of the New York Longitudinal Study by Thomas, Chess, Birch, Hertzog, and Korn (1963). Until then, most studies focused on the influence of the environment on children’s development, including the family environment, such as parenting practices, the quality of the parent–child relationship and marital conflict (Sanson, Hemphill, & Smart, 2004; Schaffer, 1999; Thomas et al., 1963). Still, most studies of temperament and the family environment have focused on the direct associations with children’s development (Sanson et al., 2004), and both have been found to be associated with substance use and externalizing behaviors (Barnes, Reifman, Farrell, & Dintcheff, 2000; Kitzmann, Gaylord, Holt, & Kenny, 2003; Teerikangas, Aronen, Martini, & Huttunen, 1998; Willem et al., 2011). Some studies have also examined how they may interact with each other. This is important since the impact of temperament on children’s development has long been considered to be dependent on their environment (Thomas & Chess, 1977; Wachs, 2000). However, specific information regarding their pattern of interaction is lacking. Accordingly, the present study will systematically review studies on the interactions between temperament and the family environment in the prediction of adolescent substance use and externalizing behaviors and examine the pattern of these interactions according to two theoretical models.

To complete this introduction, we will now clarify the concepts of temperament and family environment, examine the associations they each have with substance use and externalizing behaviors, and consider why and how we could study their interaction in the prediction of substance use and externalizing behaviors.

Temperament, substance use and externalizing behaviors

Researchers usually either study specific temperament dimensions or cluster temperamental dimensions into overarching temperament profiles, with few indications that one method would have specific

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