



Moderators of the association between peer and target adolescent substance use



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HIGHLIGHTS

- Moderators of peer association on adolescent substance use are reviewed.
- Individual, peer, family and broader contextual factors are reviewed as moderators.
- Further methodological considerations in the study of these moderators are addressed.
- Areas for further investigation and clinical implications are discussed.

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ABSTRACT

Associating with substance using peers is generally considered as one of the most important predictors of adolescent substance use. However, peer association does not affect all adolescents in the same way. To better understand when and under what conditions peer association is most linked with adolescent substance use (SU), this review focuses on the factors that may operate as moderators of this association. The review highlighted several potential moderators reflecting adolescents' individual characteristics (e.g., pubertal status, genes and personality), peer and parental factors (e.g., nature of relationships and parental monitoring), and contextual factors (e.g., peer, school and neighborhood context). As peer association is a broad concept, important methodological aspects were also addressed in order to illustrate how they can potentially bias interpretation. Taking these into account, we suggest that, while the effects of some moderators are clear (e.g., parental monitoring and sensation seeking), others are less straightforward (e.g., neighborhood) and need to be further examined. This review also provides recommendations for addressing different methodological concerns in the study of moderators, including: the use of longitudinal and experimental studies and the use of mediated moderation. These will be key for developing theory and effective prevention.

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1. Introduction

Youth substance use is a problem commonly encountered in societies all around the world. By grade nine, 29.8% of adolescents in the United States had drunk alcohol in the past 30 days, 14.0% had binge drank and 30.8% had tried marijuana at least once in their lives (Eaton et al., 2012). These rates increase during later adolescence, and the prevalence of adolescent alcohol dependency can reach 5.6% between the ages of 15 to 19 years old (Tjepkema, 2004). Although prevalence of use is lower in early adolescence, the younger teenagers are when they first try alcohol or drugs, the greater their risk for future substance use disorders and/or future psychological disorders (Chassin, Pitts, & Prost, 2002; DeWit, Adlaf, Offord, & Ogborne, 2000; Grant & Dawson, 1997; McGue, Iacono, Legrand, Malone, & Elkins, 2001). Nevertheless, substance use initiation and growth occur in the context of numerous factors, including parental influence (Bahr, Hoffmann, & Yang, 2005), personality and temperament (Wills, Windle, & Cleary, 1998) and early puberty (Ge et al., 2006; Grant & Dawson, 1998).

The strongest proximal predictors of adolescent substance use are widely acknowledged as being peer substance use and peer deviance (Akers, Krohn, Lanzakaduce, & Radosevich, 1979; Bauman & Ennett, 1996; Fallu et al., 2010). For example, affiliation with substance-using friends strongly correlated ($r = .43-.60$) with adolescents' own concurrent and future substance use (Allen, Donohue, Griffin, Ryan, & Turner, 2003; Barnow et al., 2004; Branstetter, Low, & Furman, 2011; Jackson, 1997; Reifman, Barnes, Dintcheff, Farrell, & Uhteg, 1998; Simons-Morton, 2004; Wills & Cleary, 1999). This makes peer association an ideal object of study in order to better understand influences on adolescent substance use. "Peer association" in this review, entails the ways by which substance using or delinquent peers are thought to influence, directly and indirectly, an adolescent's – technically referred as a "target" – own substance use. This influence consists of, but is not limited to, peer pressure, perceived peer norms on substance use and/or actual peer norms on substance use. Such a definition is quite similar to the one given for peer socialization (Hoffman, Sussman, Unger, & Valente, 2006), but since peer socialization infers a directionality more suited for experimental studies, the term "peer association" has been chosen instead.

The relationship between peer and target adolescents is inherently reciprocal, with target adolescents also influencing their peers' behavior. This reciprocity needs to be discussed in order to clarify how this review has been structured and what type of associations will be examined. Indeed, one of the most common debates in the study of peer association regards the opposition of the peer socializing (influence) theory to the peer selection theory. On the one hand, the socializing theory states that peers' deviant behaviors and substance use are important

in explaining an individual's future actions. This theory is particularly important in explaining the role of peers on targets' substance use and is referred to in many longitudinal studies (Reifman et al., 1998; Sieving, Perry, & Williams, 2000; Wills & Cleary, 1999). On the other hand, the peer-selection theory states that an individual's own deviance and substance use will influence which friends they select. This theory is also supported by a number of studies (e.g., Iannotti, Bush, & Weinfurt, 1996; Knecht, Burk, Weesie, & Steglich, 2010; Poelen, Engels, Van Der Vorst, Scholte, & Vermulst, 2007). These theories can be reconciled thanks to studies that have examined both models simultaneously through the use of a cross-lagged (or transactional) or other longitudinal designs, showing that they both have their place in the substance use literature (Burk, van der Vorst, Kerr, & Stattin, 2012; Dishion & Owen, 2002; Duarte, Escario, & Molina, 2011; Fergusson, Swain-Campbell, & Horwood, 2002; Kiuru, Burk, Laursen, Salmela-Aro, & Nurmi, 2010; Mercken, Steglich, Knibbe, & des Vries, 2012; Poelen et al., 2007; Simons-Morton, 2007; Wills & Cleary, 1999). However, Jaccard, Blanton, and Dodge (2005) appropriately point out that cross-sectional designs confound the effects of peer socialization and peer selection. Therefore, longitudinal studies are required to circumvent the directionality issue inherent in cross-sectional studies. Moreover while some longitudinal observational studies can suggest causal links, experimental studies (e.g., using ethical proxies for adolescent substance use) are required to properly address them.

This review does not aim to clarify the debate between the relative contribution of peer socialization and selection, largely because the proportion of studies which examine moderation of the link between "peer socialization" and substance use in adolescence severely outweighs that of studies of "peer selection", and the number of studies which compare both models is even further limited. This opposition however highlights the importance of putting greater emphasis on the results from longitudinal and experimental studies and it explains why the articles in this review are subdivided by study design. Thus, this review focuses on studies that investigated moderators of "peer association" rather than moderators of "peer socialization" or "peer selection".

As stated previously, there is general consensus regarding the importance of peer deviance and peer substance use on the substance use behavior of targets. There is however, less agreement as to when and under what conditions peers are most influential. The variables representing these conditions are called moderators. A moderator refers to "a qualitative (e.g., gender, race, class) or quantitative (e.g., level of reward) variable that affects the direction and/or strength of the relation between an independent or predictor variable and a dependent or criterion variable" (Baron & Kenny, 1986). Studying moderators of peer association on target substance use behaviors such as substance use experimentation, quantity, and frequency is important. For instance, it

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