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Peer influences on alcohol expectancies in early adolescence: A study of concurrent and prospective predictors in Taiwan

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HIGHLIGHTS

- Peer effects on alcohol expectancy varied by prior alcohol use and expectancy domain.
- For the alcohol naive, exposure to peer drinking was associated with expectancies.
- The association mentioned above was moderated by advanced pubertal development.
- For the alcohol-experienced, recent alcohol drinking is the most salient predictor.
- Bridge position in a network may slightly increase the negative alcohol expectancy.

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ABSTRACT

The effects of peers on three domains of alcohol expectancies through early adolescence were prospectively examined over 2 years. Information on pubertal development, parental drinking, peer characteristics, network structure, alcohol expectancies, and alcohol consumption was assessed in a three-wave longitudinal study of 779 6th graders (~12 years of age) randomly selected from northern Taiwan. Complex survey regression analyses, stratified by drinking experience in 6th grade, were performed to identify predictors of two positive (i.e., enhanced social behaviors and relaxation/tension reduction) and one negative alcohol expectancies (i.e., cognitive/behavioral deterioration) in 7th grade. The results showed that the effects of peer influence on adolescents' alcohol expectancies varied by prior drinking experiences and by expectancy domains. For the alcohol naive, recent exposure to peer drinking was significantly associated with positive and negative alcohol expectancies in grade 7, and this association was moderated by advanced pubertal development ($ESB_{late\ puberty}$: $ß_{wt} = 0.55$; $ESB_{early\ puberty}$: $ß_{wt} = -0.40$; $PRTR_{late\ puberty}$: $ß_{wt} = 0.01$; $PRTR_{early\ puberty}$: $ß_{wt} = 1.22$; $CBD_{late\ puberty}$: $ß_{wt} = -0.84$; $CBD_{early\ puberty}$: $ß_{wt} = 0.56$). For the alcohol experienced, neither peer drinking nor pubertal development showed any significant links with alcohol expectancies. Occupying a bridge position was slightly linked with negative expectancy ($ß_{wt} = 0.25$). Concurrent drinking serves as a strong predictor for the endorsed alcohol expectancy in both groups, particularly for the domain of enhanced social behaviors. If these effects are confirmed, knowledge of the effect of interplay between peer factors and pubertal development on alcohol expectancies in early adolescence can provide effective targets in prevention programs.

1. Introduction

Adolescence is characterized by dramatic changes in multiple domains (Steinberg, 2005), including cognitive processes and social attachment. These rapid changes, originally thought to be evolutionarily beneficial, have been linked to age-related increases in certain behavioral problems including alcohol drinking in modern society (Dahl, 2004; Spear, 2000; Steinberg, 2005; Witt, 2010). In Taiwan, the lifetime prevalence of underage drinking has risen from 16.7% in 1996 to 42.6% in 2006 (Chen et al., 2008, 2009, 2011; Chou, Liou, Lai, Hsiao, & Chang, 1999;

Abbreviations: AREC, Alcohol-Related Experiences among Children; CAEQ-C, The Chinese version of the Alcohol Expectancy Questionnaire-Child form; ESBs, Enhanced social behaviors; PRTR, Promoting relaxation or tension reduction; CBD, Cognitive and behavioral deterioration.

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Hung, Yen, & Wu, 2009). Studies in many parts of the world have indicated that early onset of drinking is significantly associated with increased risks of emotional and physical health problems, such as depression and motorcycle crashes (Hung et al., 2009; Lin, Chang, Pai, & Keyl, 2003; National Research Council & Institute of Medicine, 2004). These observations have prompted investigation in the emergence and evolution of drinking behaviors from a developmental perspective (Deas, Riggs, Langenbucher, Goldman, & Brown, 2000).

To date, several theoretical paradigms have been developed to explain the causes for early-onset alcohol use and the mechanisms underlying the progression of alcohol use disorders. The alcohol expectancy theory is one of the most promising paradigms (Goldman, Del Boca, & Darkes, 1999). Expectancies, acting as information templates, can process, categorize, and match various stimuli to tentative responses by anticipating future events. For alcohol expectancies, multiple pathways may be activated differentially depending on previous drinking experience (Donovan, Molina, & Kelly, 2009; Nicolai, Moshagen, & Demmel, 2012; Wardell, Read, Curtin, & Merrill, 2012). The perception of alcohol's effects prior to the initiation is often subject to uncertainty about the effects of alcohol and is susceptible to others' behaviors within a social context. After the first and subsequent drinks, one's expectations about alcohol may change, depending on individual physiological responses and social interaction reward (Thombs, 1993). For the alcohol experienced, alcohol can be a means to alleviate the uneasiness in social interactions, to fit in with the peer group, or to maintain position in the social network (Lewis & O'neill, 2000). Since the relationship between alcohol expectancy and drinking behaviors may be heterogeneous across the stage of alcohol involvement (e.g., lifetime abstinence, experimental drinking, regular drinking, and alcohol dependence) (Aas, Leigh, Anderssen, & Jakobsen, 1998; Cameron, Stritzke, & Durkin, 2003; Goldman et al., 1999; Smith, Goldman, Greenbaum, & Christiansen, 1995; Windle et al., 2008), it is vital to separate the alcohol naive and experienced when investigating predictors of endorsed alcohol expectancy (Martino, Collins, Ellickson, Schell, & Mccaffrey, 2006).

Peers have long been recognized as one of strongest predictors affecting drinking behaviors in adolescence (National Research Council & Institute of Medicine, 2004; Patrick & Schulenberg, 2013), especially for peer use of alcohol in cross-sectional studies. Peers indeed can exert their influences through multiple processes, including behavioral modeling, peer norms, and social relationship. For example, recent studies on peer effects reported that individuals having drinking peers or occupying a bridge position in the network are more likely to drink (Ennett et al., 2006; Mundt, 2011; Valente, Gallaher, & Mouttapa, 2004). Bridge status, the social tie connecting different subgroups, often provides the crucial route for information exchange between groups. Adolescents occupying a bridge position may have more opportunities to meet drinking peers, to observe effects of alcohol (on others), or to get alcoholic beverages from peers (Burt, 2000; Kreager & Haynie, 2011). Under the paradigm of alcohol expectancy, the salient effects of drinking peers and network position on underage drinking behaviors raise the possibility that peers' drinking behaviors or the connections to peers may affect one's endorsed alcohol expectancy (Martino et al., 2006; Pfaff, 2006).

The greatest variation of pubertal development generally emerges in the 7th grade (nearly the ages of 13–14 years) (Dorn, Crockett, & Petersen, 1988). The onset of puberty may mark a change not only in the nature of interpersonal relationship, but also in the response to alcohol. Recent reviews suggest that adolescents are extremely sensitive to certain rewarding effects of alcohol (e.g., alcohol-induced social activation) after consuming low-dose of alcohol (Peper & Dahl, 2013; Spear & Varlinskaya, 2005); meanwhile, they also become less sensitive to several adverse alcohol effects that may consequently moderate intake (e.g., social inhibition, sedation, and motor impairment) (Varlinskaya, Vetter-O'Hagen, & Spear, 2013). Similarly, several studies have reported the prominent change in alcohol expectancies during early adolescence (Bekman, Goldman, Worley, & Anderson, 2011; Cameron et al., 2003; Dunn & Goldman, 1998), suggesting that the observed differential perception of alcohol's effects may be related, at least in part, to development-related changes in emotional arousability and motivation regulation (Goldman et al., 1999; Read, Lau-Barraco, Dunn, & Borsari, 2009; Steinberg, 2005).

Although interests in the role of social contexts in alcohol expectancy in young populations are rising, some gaps in our knowledge remain. First, previous analyses often adopted a binary approach to conceptualizing alcohol expectancies in young population (i.e., positive and negative only) and gave little consideration to the multi-domain nature of alcohol expectancies. Considering that the connection between drinking behaviors and alcohol expectancy may differ by domain, understanding important factors involved in the formation of multi-domain expectancies toward alcohol is important in order to delay alcohol initiation and to reduce drinking in early adolescence (Steinberg, 2005). Second, during the transition from childhood into adolescence, the major social agent for involvement and interaction gradually shifts from parents to peers (Patrick & Schulenberg, 2013; Steinberg, Vandell, & Bornstein, 2010; Windle et al., 2008). Nevertheless, available evidence on the effects of social context on alcohol expectancy in young people has generally focused on concurrent family influence (e.g., parental drinking or family socioeconomic status) (Chen et al., 2011; Donovan et al., 2009; Shen, Locke-Wellman, & Hill, 2001; Smith & Goldman, 1994), relatively few studies have explored family's long-term effects. Even when peers are the primary interest on alcohol expectancy, the information was mostly restricted to variables concerning peer drinking behaviors (Cumsille, Sayer, & Graham, 2000; Martino et al., 2006), with little attention paid to the effects of peer structure during the transition (Dishion & Tipsord, 2011). Finally, although the nature of social context and the susceptibility to social influence depend on developmental stages (Steinberg, 2005), few studies on underage alcohol expectancy have investigated whether the connection between social influence and alcohol expectancy may vary by pubertal development.

To address these knowledge gaps, we conducted a longitudinal study following a cohort of school-aged children over the period from primary school into middle school in Taiwan. The present study aimed to (i) examine the extent to which social factors affecting the endorsed multi-domain alcohol expectancy may differ by prior experience of actual drinking during the transition into adolescence; and (ii) investigate whether pubertal developmental may differentially influence the effects of crucial social agent (i.e., peers and parents) on the endorsed alcohol expectancy. Given that the recognition of social stimuli and responses toward alcohol are development-dependent (Varlinskaya et al., 2013), we hypothesized that for the alcohol naive youngsters, their alcohol expectancies are strongly linked with drinking behaviors of peers and such relationship may differ by pubertal development. However, for the alcohol-experienced youngsters, the development of expectancy toward alcohol may be more affected by actual drinking experience. To take the best advantage of developmental variation, we obtained the assessment of peer drinking and pubertal development from the 7th grade.

2. Methods

2.1. Participants

The sample consisted of 779 6th grade students (aged 11–12) who provided parental and self-consents to participate in this prospective cohort study (i.e., the Alcohol-Related Experiences among Children, AREC) and completed three waves of interviews. In brief, the baseline samples were selected via the stratified multistage probability sampling. In each of the four strata defined by sizes of the school (e.g., number of students and teachers) and neighborhood characteristics (e.g., number of educational institutions in the area and the distance to the closest subway station), 4–8 schools were randomly chosen. Three 6th-grade classes were randomly selected in each school and all