



Short Communication

Peer drug use and adolescent polysubstance use: Do parenting and school factors moderate this association?

Gary C.K. Chan^{a,*}, Adrian B. Kelly^a, Annemaree Carroll^{a,b}, Joanne W. Williams^c^a Centre for Youth Substance Abuse Research, The University of Queensland, Brisbane, Australia^b School of Education, The University of Queensland, Brisbane, Australia^c School of Health and Social Development, Deakin University, Melbourne, Australia

HIGHLIGHTS

- Adolescent polysubstance use was strongly associated with peer's drug use.
- Parental disapproval of drug use was associated with reduced polysubstance use, and mitigated the influence of peers.
- Other parenting and school factors influenced polysubstance use independent of peer's drug use.

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ABSTRACT

Aims: This study examined the association between peer drug use and adolescent polysubstance use, and investigated if this association was moderated by parenting and/or school factors.

Methods: The sample consisted of 9966 participants (mean age = 14.3; 49.34% males) randomly selected from secondary schools in Victoria, Australia. Three 30-day polysubstance use profiles were derived from latent class analysis – no drug use (47.7%), mainly alcohol use (44.1%) and polysubstance use (8.2%). These profiles were then regressed on peer's drug use, family conflict, parental monitoring, parental disapproval of drug use, school commitment, reward for prosocial involvement in school and academic failure, and the interactions between peer's drug use and each of the parenting and school variables.

Results: Relative to non-users, peer's drug use was strongly associated with polysubstance use (OR = 30.91, $p < 0.001$), and this association was moderated by parental disapproval of drug use (OR = 0.46, $p < 0.001$). This indicated that high level of parental disapproval may mitigate the negative influence of drug using peers. School commitment and parental monitoring were significantly associated with reduced likelihood of polysubstance use ($p < 0.05$), but they did not moderate the relationship between peer drug use and adolescent polysubstance use. All analyses were adjusted for key demographic factors such as age, gender, areas of residence, birth place and family affluence.

Conclusion: Reinforcing parent disapproval of drug use may be an important strategy in reducing adolescent substance use. Parents may need to be more integrated into mainstream prevention programs.

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1. Introduction

In Western countries, polysubstance use, defined as the use of multiple substances (including alcohol and tobacco) concurrently or simultaneously, is common among adolescents (Connor, Gullo, White, & Kelly, 2014; White et al., 2013). Prevalence estimates from 22 European countries indicate that around 30% of 15- to 16-year-olds had consumed more than one drug in the past month (EMCDDA, 2009); in Australia,

over 20% of 12- to 17-year-olds report lifetime polysubstance use (White et al., 2013).

One of the strongest and most consistent correlates of adolescent drug use is peer drug use (Cumsille, Sayer, & Graham, 2000; Kelly et al., 2012). Given the proliferation of drug use among adolescents, particularly alcohol, tobacco and to a lesser extent cannabis, vulnerable young adolescents are highly likely to be exposed to drug paraphernalia and offers to use drugs. While the link between peer and adolescent use of a specific was well documented, relatively little research has examined peer influence in the context of polysubstance use, and if the negative influence from substance using peer can be buffered by protective factors within family and school.

* Corresponding author at: Centre for Youth Substance Abuse Research, The University of Queensland, Brisbane, QLD 4072, Australia.

E-mail address: c.chan4@uq.edu.au (G.C.K. Chan).

There is strong evidence that parental disapproval, monitoring and family conflict are each strongly related to adolescent use of a specific drug (Chan et al., 2013; Kelly et al., 2011; Ryan, Jorm, & Lubman, 2010), and there is some evidence that these parental factors can also mitigate the influence of peers who use substances (Marschall-Lévesque, Castellanos-Ryan, Vitaro, & Séguin, 2014). However, this moderating effect of parents on peer influence was not examined in the context of polysubstance use. Outside the proximal influence of parents and peers, school is one of the most important socialization units that provide opportunities for prosocial activities and contexts (Catalano, Oesterle, Fleming, & Hawkins, 2004). Involvement in school-based activities can increase the exposure to prosocial peer groups, facilitating the internalization of prosocial norms that discourage substance use. A positive school climate and strong connectedness to school has been linked to reduced risk of adolescent substance use (Bond et al., 2007; Catalano et al., 2004), but it is unclear if these school factors moderate the relationship between substance-using peers and polysubstance use.

In this study we focused on polysubstance use, rather than the use of specific drugs because adolescents commonly have experience with more than one drug, specific drugs are often combined in simultaneous use (Quek et al., 2013), and there is evidence that certain drugs increase the likelihood of other drug use (Kandel, 2002). In addition, adolescents may be particularly vulnerable to the interactive and neurotoxic effects of polysubstance use (Connor et al., 2014; Sung et al., 2013).

The key research question of this study was: To what extent might family factors (parental monitoring, parental disapproval of drug use and family conflict) and school factors (school commitment, academic achievement, and prosocial involvement) be associated with adolescent polysubstance use, and do these factors mitigate the negative influence of substance using peers. Our hypotheses were that (1) family and school factors would be associated with adolescent polysubstance use, and (2) these factors would moderate peer drug influences on polysubstance use. While there is some evidence that parents and schools can buffer the negative influence of drug using peers (Marschall-Lévesque et al., 2014), to our knowledge, this is the first study that tests the moderation effect of family and school factors on peer influences on adolescent polysubstance use.

2. Method

2.1. Sample

The initial sample consisted of 10,273 secondary school students from Grade 7, 9 and 11 (mean age = 12.51, 14.46 and 16.42 respectively; 49.34% males). Of the initial sample, 307 students had >3 missing data in drug use measures and were excluded from the analysis. The analysis sample consisted of 9966 students.

2.2. Procedure

The data collection involved a two-stage sampling strategy with schools in Victoria, Australia randomly selected in the first stage and classes in Grade 7, 9 and 11 randomly selected in the second stage. Detailed sampling procedure is described elsewhere (Kelly, Chan, Mason, & Williams, 2015). The survey was approved by the Royal Children's Hospital Human Ethics Research Committee, Melbourne, and the use of the data was approved by The University of Queensland.

2.3. Measures

The measures were based on the Communities That Care Youth Survey, an epidemiological assessment instrument that was developed in the United States to measure risk and protective factors of adolescent deviance behavior. Detailed description of measures in this survey can be found in Arthur, Hawkins, Pollard, Catalano, and Baglioni (2002).

Drug use was measured using five items relating to alcohol, tobacco, cannabis, inhalants and other illicit drug use in the last month (e.g. "In the past 30 days, have you ever had more than a few sips of an alcoholic beverage?" Never/1–2 times/3–5 times/6+ times). *Drug use profiles* were then derived from these five items using Latent Class Analysis. Details of the analytic procedures, model fit statistics and class descriptions are described elsewhere (Kelly et al., 2015). Three distinct profiles were identified: (1) *no drug use* (47.7% of the sample), (2) *mainly alcohol use* (44.1% of the sample) – participants in this profile have a high probability of using alcohol (0.65), a small probability of tobacco use (0.10) and essentially zero probability of using other drugs, and (3) *polysubstance use* (8.2% of the sample) – participants in this profile have very high probabilities of using alcohol (0.96) and tobacco (0.92), a moderate probability of using cannabis (0.48), and small probabilities of using inhalant (0.08) and other illicit drugs (0.13).

Peer's drug use was measured using 4 items (e.g. "How many of your 4 best friends have smoked cigarettes/tried alcohol/marijuana/other illegal drugs?"; Cronbach's $\alpha = 0.77$). The response scale was a 5-point scale from 0 "None" to 4 "4 of my friends".

2.3.1. Family measures

Parental monitoring was measured using six items (e.g. "My parents would know if I didn't come home on time". Definitely yes/Yes/No/Definitely no; Cronbach's $\alpha = 0.78$). Parental disapproval of drug use was measured using four items (e.g. "How wrong do your parents feel it would be for you to smoke cigarettes? Not wrong at all/A little bit wrong/Wrong/Very wrong"; $\alpha = 0.78$). Family conflict was measured using three items (e.g. "We argue about the same things in my family over and over". Definitely yes/Yes/No/Definitely no; $\alpha = 0.78$).

2.3.2. School measures

School commitment was measured using seven items. An example item was "How often do you feel that the school work you are assigned is meaningful and important? Almost always/often/sometimes/rarely/never" ($\alpha = 0.77$). Reward for prosocial involvement in school was measured using three items (e.g. "My teachers praise me (tell me I'm doing well) when I work hard in school" Definitely yes/Yes/No/Definitely no; Cronbach's $\alpha = 0.75$). Academic failure was measured using two items (e.g., "Putting them all together, what were your marks like last year? Very good/Good/Average/Poor/Very poor"; $\alpha = 0.67$).

3. Statistical analysis

Drug use profile was regressed on school and family variables in a multinomial logistic regression using Vermunt's 3-step method (Vermunt, 2010). The interaction of peer's drug use with school commitment, academic failure, reward for prosocial involvement in school, family conflict, parental monitoring and parental disapproval against drug use were entered separately into the model and only significant interactions were retained in the final model. Since there were a total of six interactions, the significance level for the interactions was set to 0.008 (0.05/6) to adjust for the family-wise error rate. All continuous variables were standardized in the regression analysis to prevent multicollinearity of the variables and their interaction terms. The effect of age, gender, area of residence (urban/regional), whether born overseas and peer's drug use were fully adjusted for.

4. Results

Results from logistic regression indicate that the interaction between peer's drug use and parental attitude against drug use was the only significant interaction ($p < 0.001$) and therefore was retained in the final model (Table 1). With reference to *non-users*, high level of school commitment, higher level of parental monitoring and parental disapproval of drug use were associated with lower odds for *mainly alcohol use* and *polysubstance use* ($p < 0.05$). Family conflict, academic

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