

# Typology of Substance-Use, Interpersonal Problems, and Risk Behavior among Maltreated Adolescents

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## Introduction

- Childhood adversities are often related with substance-use problems which typically commence and increase during adolescence (Rogosch, Oshri, & Cicchetti, 2010; Thornberry, Henry, Ireland, & Smith, 2010). Few studies look at the broad spectrum of substance use (e.g., Shin et al., 2010), and instead focus on the use of one substance at a time (e.g., alcohol use).
- Substance use in turn is associated with an array of adjustment problems including family and interpersonal problems, high risk behavior, and delinquent acts (Evans-Whipp et al., 2013; Popovici et al., 2012).
- In the present study assessment for the typology of substance-use in maltreated adolescents based on number of substances, and its association with substance use related interpersonal problems, high risk behavior, and police arrests was conducted. It was hypothesized that (1) there would exist mutually exclusive groups of substance use in maltreated adolescents, and (2) more adolescents in heavy polysubstance use classes would report higher interpersonal problems, and risk behavior.

## Method

### Participants

- The participants were in the age range of 12-17 years ( $M = 14.92$ ,  $SD = 1.58$ ; 49.6% female) and were residing with a parent or a guardian. It was a subsample of the National Survey of Adolescent dataset of 1995 (NSA; Kilpatrick & Saunders, 1995;  $N = 4023$ ). Further, 68.6% reported to belong to the category of Caucasian, 19.3% to African-American, 2.5% American Indian, 1% Asian, and less than a percent were Pacific Islanders or did not report a race. Another 7.7% reported to belong to some other race than those inquired for.

### Measures

- **Substance use variables:** The following variables were used (i) ever tried cigarette smoking; (ii) regular cigarette smoking, i.e., at least one cigarette every day for a month; (iii) chewed/snuffed tobacco in the past month; (iv) ever had alcohol; (v) ever had alcohol during the past one year; (vi) frequency of alcohol during past one year; (vii) binge-drinking during past one year; (viii) non-prescribed use of prescribed drug (e.g., valium, amphetamines, etc), and (ix) illicit drugs (one versus polydrug-use among which were marijuana, cocaine, angel dust, LSD, heroin, or inhalants.)

- Dichotomous scores (yes/no) were assessed for interpersonal problems related to substance use, risk behavior related to substance use (e.g., DUI), and police arrests related to substance use.

Table 1

Fit indices for the latent class models with three to six classes for substance-use in maltreated adolescents

Number of classes	LMR (p value)	Entropy	AIC	BIC	Adjusted BIC
3	490.29 (0.000)	0.90	7840.74	8023.99	7903.31
4	100.32 (0.14)	0.86	7765.29	8011.23	7849.26
5	<b>98.84 (0.000)</b>	<b>0.84</b>	<b>7691.34</b>	<b>7999.96</b>	<b>7796.70</b>
6	65.88 (0.25)	0.82	7650.72	8022.03	7777.48

Note: LMR = Lo-Mendell-Rubin test. AIC = Akaike's Information Criterion. BIC = Bayesian Information Criterion.

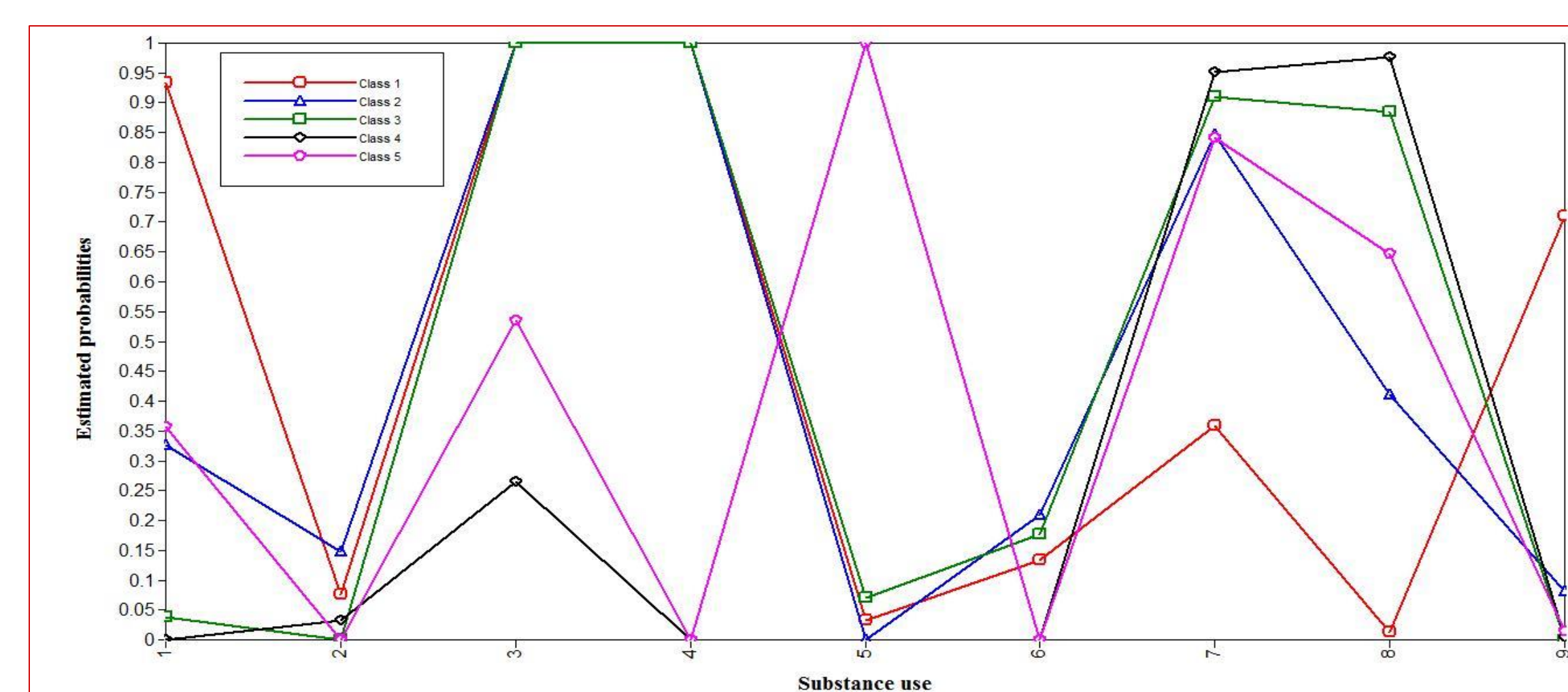


Figure 1: Estimated probabilities of use of types of substance across five classes among adolescents. The substances are numbered as mentioned in measures section

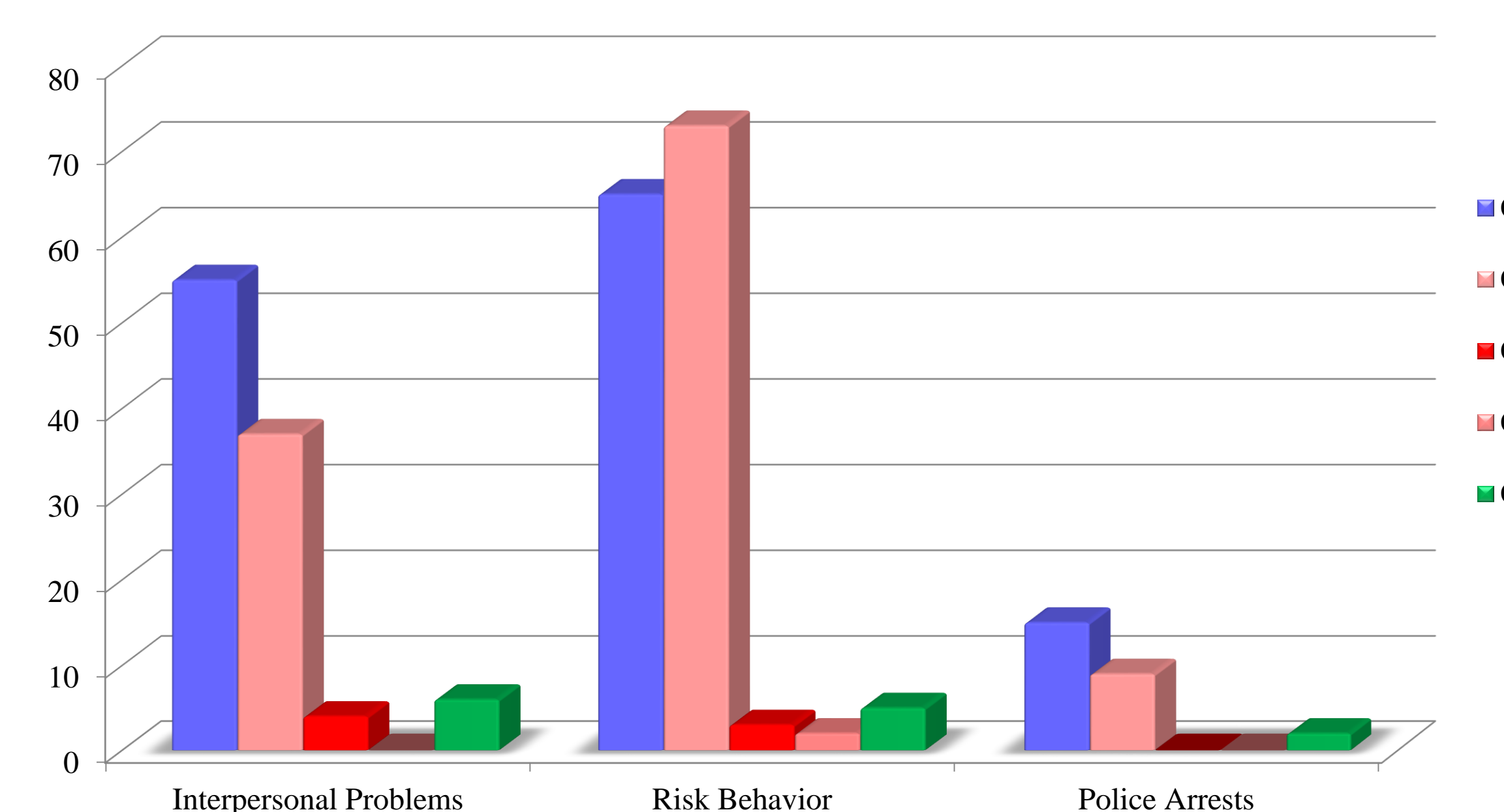


Figure 2: Percentage distribution of adolescents with interpersonal problems, risk behavior, and police arrests all related to substance-use across the five substance use classes C1/C2/C3/C4/C5 = Class 1/Class 2/Class 3/Class 4/Class 5

## Results

- Nearly 80% of the adolescents reported to have faced one or the other kind of physical assault, and 35.6% reported sexual assault.
- LCA identified a **five-class model** as the best solution (Table 1).
- BIC was the lowest (known to be the most reliable of all the indices; Nyland et al., 2007); entropy was adequate and the LMR test for the five-class model was significant; average posterior latent class probability (0.85-0.96) suggested successful class identification.
- The five classes for adolescent substance-use were subjectively termed (based on the item endorsement of substance-use) as 'Heavy poly-substance use' (Class 1: 12.6%), 'Heavy alcohol, tobacco and single drug use' (Class 2: 29.9%), 'Moderate alcohol and low medicine and single drug use' (Class 3: 19.3%), 'Low substance-use' (Class 4: 33.1%), and 'Experimental substance-use' (Class 5: 5.1%; Figure 1).
- Chi square test indicated a significant difference across the five classes of substance-use on interpersonal problems ( $\chi^2 (N = 918, df = 4) = 137.66, p < .000$ ), risk behavior ( $\chi^2 (N = 918, df = 4) = 148.86, p < .000$ ), and police arrests ( $\chi^2 (N = 918, df = 4) = 38.27, p < .000$ ).
- Adolescents in Heavy poly-substance use classes (Class 1 and Class 2) and the experimenters reported higher interpersonal problems, risk behavior, and police arrests than the other two classes (Figure 2).

## Discussion

- Meaningful typologies of substance-use among victimized adolescents were found. A **five-class solution** was found to be optimal across a range of substance-use in the present study.
- Adolescents in all classes reported the use of non-prescribed use of medically prescribed drug and illicit drug, and not just the normative substances like alcohol or cigarette-smoking.
- Use of poly-substances across the five classes was found in the present study and is in line with literature supporting polysubstance use among victims with childhood abuse (Hakansson, Schlyter, & Berglund, 2011; Widom, Marmorstein, & White, 2006).
- Adolescents in **Heavy poly-substance use classes** (Class 1 and Class 2) and the experimenters reported **higher interpersonal problems, risk behavior**, and police arrests than those in low substance use or experimental substance use classes.
- Facilitates clinicians in identifying maltreated adolescents at increased risk for serious substance use, and related interpersonal problems, and risk-taking behavior.