

Carroll, A., Houghton, S., Bourgeois, A. (2014). Self-reported substance use among high school students with and without learning difficulties. *Australian Journal of Learning Difficulties*, 19(1), 47-59. doi: 10.1080/19404158.2014.909861

## **Self-reported Substance Use among High School Students With and Without Learning Difficulties**

**Annemaree Carroll<sup>1\*</sup>, Stephen Houghton<sup>2</sup>, & Amanda Bourgeois<sup>1</sup>**

<sup>1</sup>The University of Queensland, School of Education, Brisbane Q 4072, Australia

<sup>2</sup>The University of Western Australia, Graduate School of Education, Nedlands WA 6907, Australia

RUNNING HEAD: Adolescent substance use and learning difficulties

WORD COUNT: 5768 words

\*Correspondence should be addressed to Dr Annemaree Carroll, The University of Queensland, School of Education, Brisbane Q 4072, Australia (e-mail: [a.carroll@uq.edu.au](mailto:a.carroll@uq.edu.au))



## Author Biographical Information and Research Interests

**Annemaree Carroll, PhD**, is Associate Professor in the School of Education at The University of Queensland, Brisbane, Australia. Her research activities focus on the self-regulatory processes of adolescent behaviour and child and adolescent emotional and behavioural difficulties. She has been particularly concerned with developing innovative multimedia methods and strategies for enhancing the engagement and motivation of at-risk children and youth to bring about positive change in their lives. Address: School of Education, The University of Queensland, Brisbane Q 4072, Australia. Email: [a.carroll@uq.edu.au](mailto:a.carroll@uq.edu.au)

**Stephen Houghton, PhD**, is a registered psychologist and is Professor and Director of the Centre for Child and Adolescent Related Disorders at the University of Western Australia. His areas of research are child and adolescent psychopathology, particularly conduct disorder and the construct of juvenile psychopathy, and adolescent mental health. Address: Graduate School of Education, The University of Western Australia, Nedlands WA 6009. Email: [stephen.houghton@uwa.edu.au](mailto:stephen.houghton@uwa.edu.au)

**Amanda Bourgeois** is a research officer in the School of Education at the University of Queensland. Her research areas include teacher connectedness and student well-being. Address: School of Education, The University of Queensland, Brisbane Q 4072, Australia. Email: [a.bourgeois@uq.edu.au](mailto:a.bourgeois@uq.edu.au)

# **Self-reported Substance Use among High School Students With and Without Learning Difficulties**

## **Abstract**

One hundred and ninety-seven Year 9 and 10 students, 74 of whom had learning difficulties, from two high schools in Brisbane, the capital city of Queensland, Australia, self-reported their substance use. Seventeen substances, including two fictitious ones to detect over-reporting, were presented to participants for them to indicate their current usage, ex-usage, or non-usage. The findings revealed that participants were most likely to use alcohol, tobacco, and marijuana. A series of Chi-square analyses found that male students with learning difficulties and female students without learning difficulties were at greatest risk of substance use, overall. These findings are discussed in the light of the previous limited research pertaining to substance use amongst students with learning difficulties.

114 words

## Self-reported Substance Use among High School Students With and Without Learning Difficulties

Approximately 10% to 16% of children and adolescents in Australia present with learning difficulties (Jenkinson, 2007), which is a substantial proportion of the school population. Learning difficulties is a generic term with a variety of definitions (Department of Education and Child Development, 2012; Hilton & Hilton, 2012; Woolfolk & Margetts, 2013). In the United Kingdom, for example, learning difficulties refers to ‘disabilities’, whereas in most other parts of the world, learning difficulties or learning disabilities are terms used to define a student who has been identified with “normal intelligence but who has difficulty in one or more academic areas and the difficulty cannot be attributed to any other diagnosed disorder” (Arnett, 2013, p. 298).

The Department of Education and Child Development (2012) in Australia identifies a student with a learning difficulty if their academic achievement is below the standard expectation given the student’s age, although the term learning disability is used if the student displays academic achievement *significantly* below the standard expectation given the student’s age (e.g., dyslexia, dyspraxia, difficulties with motor skills and/or communication skills).

Although the propensity to engage in problem behaviours is well documented for adolescents with learning difficulties (LD) (Arnett, 2013; Watson & Boman, 2005), little is known about their substance use. Given the limited research in the field of substance use and adolescents with LD, coupled with the potential adverse outcomes for this vulnerable population, the present study sought to investigate the prevalence rates and types of substances used by Year 9 and 10 male and female students with LD and then to compare these rates to those of students without LD.

Although extensive research has been conducted on substance use, the vast majority has focussed on the mainstream high school adolescent population, much to the detriment of those who work with students with LD, particularly in policy and intervention development and evaluation. For example, in what appears to be the most recent national survey (the 2010 National Drug Strategy Household Survey; Australian Institute of Health and Welfare [AIHW], 2011a), it was reported that the “regular use” of substances by Australian adolescents was of great concern with 18.2% of 14 to 19 year olds consuming alcohol at least weekly and 6.9% being daily users of tobacco. Furthermore, 18.2% of 14 to 19 year olds reported “recent use” of a substance, with 15.7% reporting use of marijuana within the past year. Moreover, lifetime prevalence rates for adolescent substance use was reported to be at levels which also raised great concern. Specifically, 67.6% of 14 to 19 year old adolescent females and 67.5% of adolescent males had “ever used” alcohol, 12.1% of females and 11.7% of males had “ever used” tobacco, and 21.4% of adolescent females and 21.5% of adolescent males had “ever used” marijuana. Marijuana was the most common “illicit” substance “ever used” by 14 to 19 year olds (23.8%), followed by ecstasy (5.5%), inhalants (3.5%) and hallucinogens (3.3%) (AIHW, 2011a). Although prevalence rates were similar for males and females for each of the substances separately, overall 16 to 24 year old males reported higher substance use disorders by 5% compared to their female counterparts. Males also displayed greater use of marijuana by 3% with females showing greater alcohol consumption by 1% (AIHW, 2011b). Although these data are important for informing policy and drug program development, the lack of differentiation between students with and without LD potentially limits the effectiveness of such programs with a considerable percentage of mainstream school students (i.e., students with LD).

Numerous heterogeneous explanations and correlates for why adolescents use substances have been proposed. For example, adolescent substance use is associated with: friends substance use and curiosity (Arnett, 2013; McArdle & Gilvarry, 2007; Mirza &

Mirza, 2008; Nation & Heflinger, 2006); parental substance use, sibling substance use, family cohesiveness and conflict, and low levels of self-concept (AIHW, 2011a; McArdle & Gilvarry, 2007; Mirza & Mirza, 2008; Nation & Heflinger, 2006; Weinberg, 2001); for fun, to escape, as a form of stress relief, to decrease feelings of depression, and to be cool (AIHW, 2011a; Carroll, Houghton, Durkin, & Hattie, 2009; Mirza & Mirza, 2008; Nation & Heflinger, 2006). It is also well documented that predictors of adolescent substance use include antisocial behaviour (AIHW, 2011a; Nation & Heflinger, 2006) and poor school performance (AIHW, 2011a; Fakier & Wild, 2011, Jessor & Jessor, 1977; Maag, Irvin, Reid, & Vasa, 1994; McArdle & Gilvarry, 2007; Mirza & Mirza, 2008; Weinberg, 2001).

With reference to students with LD, research suggests they may have a greater propensity toward substance use because they are more prone to exhibit signs of low self-concept (Fakier & Wild, 2011; Hilton & Hilton, 2012; Weinberg, 2001), and experience considerable stress, anxiety, and depression due to their low academic achievement, poor peer relations, and consequent negative school experiences (Mirza & Mirza, 2008; Nation & Heflinger, 2006). Adolescents with LD also exhibit a higher propensity of problem behaviour and delinquency (Arnett, 2013; Watson & Boman, 2005), and delinquency has been classified as a predictor of substance use (Nation & Heflinger, 2006).

Although little research has examined the prevalence of substance use among adolescents with LD, what has been conducted has been inconsistent in terms of the findings as to whether or not substance use is more prevalent amongst those with LD (Beitchman, Wilson, Douglas, Young, & Adlaf, 2001; Fakier & Wild, 2011). Fakier and Wild (2011) argued that the reason for this may be due to the fact that there is such a variation in how learning difficulties and substance use are defined. They also noted that because students with LD are not always present in mainstream classes, they are often dismissed from surveys in regards to things such as drug use. However it is important to recognize that students with LD may be *more* susceptible to substance use because there are commonalities between the

predictors of substance use and the common characteristics of students with LD (e.g., low self-concept and poor academic achievement; Fakier & Wild, 2011).

The findings by Maag et al. (1994), and McNamara, Vervaeke, and Willoughby (2008) indicate that adolescents with learning difficulties are at higher risk of substance use, with the prevalence rates for tobacco and marijuana reported by students in their studies as significantly higher than for students without LD. Molina and Pelham (2001) investigated substance use among adolescents with and without learning difficulties and although the number of participants was relatively small ( $N = 109$ ), a significantly greater percentage of students with LD reported as “ever having tried” tobacco; students without LD, on the other hand, were more likely (in the previous six months) to have consumed five or more drinks. In a much larger study, Fakier and Wild (2011) found that adolescents with LD reported greater inhalant use, however, adolescents without LD displayed greater use of tobacco, methamphetamine, and marijuana.

Given the limited research to date, the aim of the present research was to establish the prevalence rates for substance use and the types of substances used by Year 9 and 10 students, and to ascertain whether different groups of students (LD and NLD students, male and female) report similar prevalence rates.

## **Method**

### **Participants**

Participants were 197 Year 9 and 10 students (aged 13 to 16 years) recruited from two secondary high schools located in Brisbane, the capital city of Queensland, Australia. Of the 197 students, 74 students were classified as LD (26 female, 48 male) according to official school records and the definition proposed by the Department of Education and Child Development (2012); the remaining 123 students had no diagnosed or identified LD and were classified as students without LD (NLD; 71 female, 52 male). The 13 to 16 year old age group was chosen because previous research has indicated that adolescent risk taking



behaviour, including delinquency and substance use increases during this period (see Carroll et al., 2009 for a comprehensive review; McNamara et al., 2008).

Previous research (Odgers, Houghton, & Douglas, 1997) examining adolescent substance use categorized participants as either “users” (i.e., currently using one or more substances) “non-users” (i.e., report never having used any substance), or “ex-users” (i.e., have previously used substances, but not using at present time). The present study adopted the same categorisation. Overall cell sizes for each of these categories can not be provided since the number and percentage of students in each of the three categories varied according to the substance being reported, irrespective of LD/NLD status.

### **Instrument**

A self-report questionnaire (The High School Student Activity Questionnaire; Odgers et al., 1997) composed of 17 items was used to gather information on substance use and frequency of substance use. Participants were presented with a total of 17 different substances, 15 of which were as follows: tobacco, alcohol, marijuana, cocaine, crack, benzodiazepine, uppers, heroin, LSD, other hallucinogens, poppers, volatile substances, non-medical use of steroids, speed, and ecstasy. As in the Odgers et al. (1997) study, two fictitious substances were also included (i.e., sanfargrad and ribeniterates) so as to allow a check to be made on the over-reporting of the substances. Previous research by Odgers, Houghton, and Hattie (1994) found that non-users have limited knowledge and vocabulary in relation to the names of substances and tend to report the use of one or both fictitious substances. A small number of participants (less than 5) admitted to using the fictitious substances and were excluded from the analyses.

Following each of the substances, response options were provided that allowed participants to state whether they were current users, ex-users, or non-users (i.e., Do you use alcohol?: Yes; No; Used to but not anymore). If an individual reported as a current user of a substance, or as an ex-user of a substance, he or she was requested to provide information

pertaining to its frequency of use (i.e., If yes, or used to, how many times a week do/did you use alcohol?). At the end of the questionnaire, one further item asked participants whether they used any other substances that were not included on the questionnaire, and if so, to name that substance(s) and state its frequency of use.

In addition to the potential problem of over-reporting substance use, there also exists the potential for participants to under-report their substance use. In an attempt to reduce any under-reporting of substance use, anonymity and confidentiality procedures were employed during the administration of the questionnaire. Participant anonymity was preserved by requesting the students to refrain from writing their name on the questionnaire.

Confidentiality was ensured in that the school teaching staff did not have access to the completed questionnaires and the students were aware of this procedure. In addition, discussion between participants whilst completing the questionnaire was reduced to prevent student collaboration of responses.

Demographic questions included in the questionnaire related to age, year at school, and gender. The High School Student Activity Questionnaire has been found to be a reliable and valid psychometric scale (see Odgers et al., 1997) and has a readability level of approximately 10 years (Flesch, 1948). Hence the majority of high school students were able to read and understand the contents of the questionnaire including those students with LD.

## **Procedure**

Prior to the commencement of the research, approval was obtained from the Human Research Ethics Committee of the administering institution. Consent to participate was also obtained from the principals of the selected high schools, the students and their parents, and the Queensland Department of Education. Information letters and consent forms were distributed to all students in Years 9 and 10 ( $n = 386$ ) at the two participating schools, with an affirmative response rate of 51%.

The questionnaire was administered before midday during one school period within

the students' respective classrooms. The classes consisted of approximately 25 students and prior to administering the questionnaire all students were informed about the nature of the study by the researchers and were told that the questionnaire was anonymous, and confidentiality of responses would be preserved. Furthermore, all students were given the opportunity to withdraw from the study. None of the students chose to do so. Two researchers and one classroom teacher were present while the students completed the questionnaire. Simulated test conditions were achieved whilst the students completed the questionnaire. On average, questionnaire completion was 40 minutes.

## Results

The study investigated the relationship between prevalence rates of substances among the variables of gender, year level, and the presence of learning difficulties using Chi-square analyses. Prevalence data were analysed according to the three user groups (i.e., user, ex-user and non-user).

A 2 x 3 (Gender by User Group) Chi-square analysis was performed to investigate prevalence of substance use. Table 1 displays the prevalence (including percentage) of respondents by gender who reported substance use according to the three user groups and according to the 15 surveyed substances. As can be seen in Table 1, the three most prevalent self-reported "currently used" substances were alcohol ( $n=69$ ), tobacco ( $n=43$ ) and marijuana ( $n=30$ ). Although the use of these three substances seems evenly split across males and females, the largest discrepancy is in marijuana use with males seemingly reporting greater usage, although not significantly so. The current use for the remaining substances was not greater than 2% for any of the remaining substances. Table 1 also shows that tobacco was the substance with the greatest percentage (18.3%) of reported "ex-user" status.

**<Insert Table One here>**

Table 2 shows the self-reported drug use according to the Year 9 and 10 status of participants. With respect to this, the contingency tables were each 2 x 3 (Year Level by

User Group); the two year levels were 9 and 10, and the three user groups were non-user, ex-user, and user. The statistic for tobacco was significant ( $c^2 = 14.37$ ,  $df = 2$ ,  $p < .001$ ). Data relating to self-reported tobacco use indicated that significantly more non-users existed in Year 9 (69.2% vs 49.5%) and significantly more self-reported ex-users of tobacco existed in Year 10 (29% vs 8.7%). Similar numbers of self-reported tobacco users were found in Year 9 and Year 10 (21.1% in Year 9 and 21.5% in Year 10). A significant difference in alcohol use across the two year levels was also found ( $x^2 = 6.41$ ,  $df = 2$ ,  $p < .04$ ). The analysis revealed significantly more self-reported alcohol users in Year 10 (44.1% vs 26.9%). Respectively, significantly more self-reported non-users of alcohol were in Year 9 (68.3% vs 51.6%). No other substances approached significance for year level.

**<Insert Table Two here>**

The self-reported prevalence rates for the 15 drugs according to LD group status are reported in Table 3. A 2 x 3 (LD by User Group) Chi-square analysis was performed for each of the 15 drugs. Significant differences between students with and without LD were found for self-reported alcohol use ( $c^2 = 14.02$ ,  $df = 2$ ,  $p < .001$ ). Significantly more students with LD reported using alcohol (51.4% of the LD group vs 25.2% of the NLD group), and significantly more students without LD fell into the non-user group for alcohol (69.1% of the NLD group vs 45.9% of the LD group).

**<Insert Table Three here>**

Data pertaining to drug use by LD status group and gender for the user group only are presented in Table 4. In viewing data pertaining to the user group only, tobacco ( $c^2 = 6.7$ ,  $df = 2$ ,  $p < .01$ ), alcohol ( $c^2 = 14.38$ ,  $df = 2$ ,  $p < .001$ ), and marijuana ( $c^2 = 6.4$ ,  $df = 2$ ,  $p < .02$ ) reached significance for LD group by gender. As shown in Table 4, the largest percentage of alcohol users were LD males (37.7%), followed by NLD females (34.8%). Similarly for marijuana, LD males consisted of 43.3% of all users and NLD females constituted 30% of all marijuana users. Data pertaining to tobacco use found that 37.2% of users were NLD

females, followed by 32.6% who were LD males. None of the other drugs approached significance for LD group and gender.

**<Insert Table Four here>**

### **Discussion**

The findings from the present study revealed that prevalence of substance use among male and female Year 9 and 10 students overall is similar. Females self-reported a slightly higher use of alcohol, whereas males reported a slightly higher use of marijuana. However, these results were non significant. Data pertaining to year level found that significantly more alcohol users were in Year 10 and significantly more students who had used tobacco at any time were also found in Year 10. Significantly more alcohol users were found among the LD students. Data relating to LD group by gender for those students who were currently using substances found that LD males, followed by NLD females had significantly higher prevalence rates for alcohol and marijuana use, while NLD females had the highest prevalence of tobacco use, followed by LD males.

That the three most prevalent self-reported substances of use were alcohol, tobacco, and marijuana tentatively suggests that adolescents may initially experiment with and use the gateway drugs of alcohol and tobacco, followed by a transition into marijuana use (see Arnett, 2013; Kandel, 1975). Although there were no significant differences for gender according to user group, it is interesting to note that more females used alcohol. For marijuana there was an opposite trend with more males reporting marijuana use. Similar trends were reported by Odgers et al. (1997) and AIHW (2011a).

The prevalence of alcohol and tobacco was found to be significantly associated with student year level. The Year 10 group reported a significantly higher prevalence of alcohol use. These results are consistent with other findings indicating that substance use increases with age (Arnett, 2013; Odgers et al., 1997). With reference to tobacco use, significantly more non-users were found in Year 9 and significantly more ex-users of tobacco were

reported in Year 10. It may be therefore that Year 9 is a period of experimentation with tobacco. Since the data in the present study were obtained early in the academic year, any conclusions concerning this trend should be treated with caution. It has been documented, however, that tobacco use shows a large increase from Year 8 to 9 (Odgers et al., 1997). In addition, the Australian Bureau of Statistics (2008) found that young people aged 15-24 years showed greater unsafe levels of alcohol consumption and higher rates of illicit substance use than those aged 25 or older (Mirza & Mirza, 2008).

The data pertaining to substance use by LD group status indicated that students with LD reported a significantly higher prevalence of alcohol use. Twice as many students in the LD group (51.4%) reported alcohol use, compared to those in the NLD group (25.2%). Since 35% of the total population of students reported using alcohol, it can be concluded that a strong proportion of alcohol users are LD students. It has been found that alcohol is a social mechanism for most adolescents, especially in terms of gaining a reputation (Houghton, Carroll, Odgers, & Allsop, 1998). Many adolescents report that within their peer group, alcohol use is viewed as a conforming social activity through which there is a strong sense of shared identity and this reflects a high level of conformity to preferred peer norms (Houghton et al., 1998). Adolescents with LD are known to have difficulties in initiating and maintaining friendships (Glass, Flory, & Hankin, 2010) and it may be that attempts to facilitate friendships are reflected in their higher usage of alcohol. However, this is yet to be tested.

Although there were no significant differences in marijuana and tobacco use according to LD/NLD group status, it was found that substantially more of the LD group (27%) reported themselves as tobacco users, compared to 18.7% of the NLD group. In addition, 21.6% of the LD group reported using marijuana, whilst 11.4% of the NLD population reported using marijuana. Therefore, it can be concluded that a large proportion of tobacco and marijuana users are students with LD. Maag et al. (1994) and McNamara et al. (2008) reported a significantly higher incidence of tobacco and marijuana use among the

LD population in their study while Molina and Pelham (2001) reported greater percentages of LD students having tried smoking tobacco. Thus, LD students are potentially more at risk of substance use than NLD students.

The significant differences documented for the prevalence levels of alcohol, tobacco, and marijuana according to gender and user groups are interesting. Male students with LD reported the highest frequency of alcohol use and were closely followed by females without LD. Similarly, the majority of marijuana users were males with LD followed by females without LD. Males with LD and females without LD constituted the highest users for tobacco. Of the total number of tobacco users, the majority were females without LD, followed by males with LD. It can be tentatively concluded from the present research that students in Years 9 and 10 mostly self-report alcohol, tobacco and marijuana use and are least likely to use cocaine, heroine, speed, ecstasy, LSD, benzodiazepines and steroids. The subgroups of students particularly at risk are males with LD and females without LD in Year 10, as they reported the highest prevalence of substance use.

The possibility of bias must be considered in that males may be more likely to admit to substance use as it fits an image of masculinity whereas females may be less likely to admit to it as they may feel ashamed or anxious about it. Although this may be a distinct possibility, there is substantial evidence clearly demonstrating that in risk taking behaviours, including drug use, male and female high school students and males and females in juvenile institutions seek similar non-conforming social identities and clearly wish to be seen by peers in this way (for a comprehensive review see Carroll et al., 2009).

When interpreting the findings it must be acknowledged that our results are based solely on self-report data. As with all research that uses self-report measures, the results are subject to influence from under-reporting and errors of memory (such problems are also characteristic of structured interviews) (Moller, Tait, & Byrne, 2012). However, there is evidence of concordance between adolescent self-report drug use and urine drug screen data

(Wilcox, Bogenschutz, Nakazawa, & Woody, 2013) and the reliability of self-report inventories for measuring constructs such as psychopathology has been found to increase from childhood through adolescence (Frick, Barry, & Kamphaus, 2009; Kamphaus & Frick 2002).

Research conducted by Loxley, Toumbourou, and Stockwell (2004) detected that drug use education programs in schools do alter the awareness and effects of substance use among adolescents who are present at school; however simply providing information has not shown to change the intention to use or behaviour of using drugs (Midford, 2009). They argue that using programs created by social learning theory will attest to both short-term and long-term results in minimizing substance use.

The current findings suggest that drug education programs may be more relevant if they targeted later primary school children, preceding initiation into gateway drug use. Educating primary school students about the negative effects and associated risk factors of drug use may be more powerful than educating high school students who have already begun experimenting with substances. Midford (2007) argued that young people should be educated with “evidence based drug education” (p. 426) before they reach the age of increased rates of drug use. Arnett (2013) added that programs that start at a young age, and continue annually throughout high school, have proven to have the greatest success. In addition, McWhirter (2008) found that a reduction in the early onset of substance use has shown to be more and more successful due to preventative programs; however the success of treatment programs is not as prevalent.

It must be acknowledged that the response rate of 51% may reflect the reticence of some parents to allow their adolescent to participate in a survey concerned with a sensitive subject. Furthermore, in Australia, school principals are often reluctant to allow researchers to administer instruments which sample sensitive issues and which also interfere with normal school routines and students learning. It must also be acknowledged that our results are based



solely on self-report data. Some researchers suggest that corroborative information such as official records or reports from other reliable sources be used.

This present study has identified adolescents with LD as a group vulnerable to substance use. Although research has proven the need for adolescent treatment programs that target the specific needs of the individual (McWhirter, 2008; Nation, & Heflinger, 2006), drug education programs targeting adolescents with LD are limited. This current research suggests that there is a clear need for researchers and educators to develop, implement and evaluate the effectiveness of programs specifically designed to prevent and/or reduce substance use among adolescents with LD.

In summary, alcohol, tobacco, and marijuana were the three most prevalent self-reported substances of use overall. With regards to the focus of this present research, namely students with LD, twice as many of these young people self-reported alcohol use compared to their NLD peers; a similar trend was also evident for tobacco and marijuana use, although to a lesser extent. These findings are significant in that students with LD (just like their NLD counterparts) are primarily involved in using three substances and are therefore subject to the same mechanisms which may affect their use of drugs or their intention to use drugs. However, given the increased prevalence among students with LD suggests that they may require a more focussed and sustained prevention/ intervention program.

## References

- Arnett, J. J. (2013). Academic achievement in high school: Individual differences. In J. J. Arnett, & M. Hughes (Eds.), *Adolescence and emerging adulthood, a cultural approach* (5th ed., pp. 362-393). Upper Saddle River, NJ: Pearson Education, Inc.
- Australian Bureau of Statistics. (2008). *Australian social trends 2008: Risk taking by young people in Australian social trends* (ABS Cat. No. 4102.0). Canberra, ACT: Author.
- Australian Institute of Health and Welfare. (2011a). *Young Australians their health and wellbeing 2011* (Cat. No. PHE 140). Canberra, ACT: Author.
- Australian Institute of Health and Welfare. (2011b). *2010 National Drug Strategy Household Survey report* (Cat. No. PHE 145). Canberra, ACT: Author.
- Beitchman, J. H., Wilson, B., Douglas, L., Young, A., & Adlaf, E. (2001). Substance use disorders in young adults with and without LD: Predictive and concurrent relationships. *Journal of Learning Disabilities, 34*(4), 317-332.
- Carroll, A., Houghton, S., Durkin, K., & Hattie, J. (2009). *Adolescent reputations and risk: Developmental trajectories to delinquency*. New York: Springer.
- Department of Education and Child Development. (2012). *About learning difficulties*. Adelaide, SA: Author. Retrieved from <http://www.decd.sa.gov.au/speced/pages/specialneeds/learningdifficulties/>
- Fakier, N. & Wild, L.G. (2011). Associations among sleep problems, learning difficulties and substance use in adolescence. *Journal of Adolescence, 34*, 717-726. Retrieved from doi: 10.1016/j.adolescence.2010.09.010
- Flesch, R. (1948). A new readability yardstick. *Journal of Applied Psychology, 32*(3), 221-233.
- Frick, P. J., Barry, C. T., & Kamphaus, R. W. (2009). *Clinical Assessment of Child and Adolescent Personality and Behavior*. New York: Springer.
- Glass, K., Flory, K., & Hankin, B. L. (2010). Symptoms of ADHD and close

- friendships in adolescence. *Journal of Attention Disorders*, 20(10), 1-12.
- Hilton, G., & Hilton, A. (2012). Facts about students with learning difficulties. In A. Asher, & J. Elkins (Eds.), *Education for Inclusion and Diversity* (4th ed., pp. 290-292). Frenchs Forest, NSW: Pearson.
- Houghton, S., Carroll, A., Odgers, P., & Allsop, S. (1998). Young children, adolescents and alcohol Part II: Reputation enhancement and self-concept. *Journal of Child and Adolescent Substance Abuse*, 7(3), 31-55.
- Jenkinson, J. (2007). A history of learning difficulties Australia: Part six – looking ahead. *Australian Journal of Learning Disabilities*, 12(1) 31-41.
- Jessor, R., & Jessor, S.L. (1977). *Problem behaviour and psychosocial development: A longitudinal study of youth*. New York: Academic Press.
- Kamphaus, R. W., & Frick, P. J. (2002). *Clinical Assessment of Child and Adolescent Personality and Behavior* (2nd ed.) Boston: Allyn and Bacon.
- Kandel, D. (1975). Stages in adolescent involvement in drug use. *Science*, 190, 912-914.
- Loxley, W., Toumbourou J., & Stockwell, T. (2004). *The prevention of substance use, risk and harm in Australia: A review of the evidence*. Canberra, ACT: National Drug Research Institute & the Centre for Adolescent Health. Retrieved from [http://www.health.gov.au/internet/main/publishing.nsf/Content/health-publhlth-publicat-document-mono\\_prevention-cnt.htm](http://www.health.gov.au/internet/main/publishing.nsf/Content/health-publhlth-publicat-document-mono_prevention-cnt.htm)
- Maag, J.W., Irwin, D.M., Reid, R., & Vasa, S.T. (1994). Prevalence and predictors of substance use: A comparison between adolescents with and without learning disabilities. *Journal of Learning Disabilities*, 24(4), 223-234. doi: 10.1177/002221949402700404
- McArdle, P., & Gilvarry, E. (2007). Drug and alcohol use in the young. *Psychiatry*, 6(1), 30-33.

- McNamara, J., Vervaeke, S., & Willoughby, T. (2008). Learning disabilities and risk-taking behavior in adolescents. A comparison of those with and without comorbid attention-deficit/hyperactivity disorder. *Journal of Learning Disabilities, 41*(6), 561-574.
- McWhirter, P. T. (2008). Enhancing adolescent substance abuse treatment engagement. *Journal of Psychoactive Drugs, 40*(2), 173-182.
- Midford, R. (2007). Is Australia 'fair dinkum' about drug education in schools? *Drug and Alcohol Review, 26*, 421-427. doi: 10.1080/09595230701373842
- Midford, R. (2009). Drug prevention programmes for young people: Where have we been and where should we be going? *Addiction, 105*(10), 1688-1695. doi:10.1111/j.1360-0443.2009.02790.x
- Mirza, K., & Mirza, S. (2008). Adolescent substance misuse. *Psychiatry, 7*(8), 357-362.
- Molina, B.S.G., & Pelham, W.E. (2001). Substance use, substance abuse and LD among adolescents with a childhood history of ADHD. *Journal of Learning Disabilities, 34*(4), 333-342. doi: 10.1177/002221940103400408
- Moller, C. I., Tait, R., & Byrne, D. (2012). Self-harm, substance use and psychological distress in the Australian general population. *Addiction, 108*, 211-220. doi:10.1111/j.1360-0443.2012.04021.x
- Nation, M., & Heflinger, C. A. (2006). Risk factors for serious alcohol and drug use: The role of psychosocial variables in predicting the frequency of substance use among adolescents. *The American Journal of Drug and Alcohol Abuse, 32*, 415-433.
- Odgers, P., Houghton, S., Carroll, A., & Douglas, G. (1997). The prevalence and frequency of drug use among Western Australian metropolitan high school students. *Addictive Behaviors, 22*(3), 315-325.
- Odgers, P., Houghton, S., & Hattie, J. (1994). Reputation and adolescent drug use: A focus study. *The Australian Educational and Developmental Psychologist, 11*(2), 18-24.

- Watson, J., & Boman, P. (2005). Mainstreamed students with learning difficulties: Failing and underachieving in the secondary school. *Australian Journal of Learning Disabilities, 10*(2), 43-49.
- Weinberg, N.Z. (2001). Risk factors for adolescent substance abuse. *Journal of Learning Disabilities, 34*(4) 343-351.
- Wilcox, C., Bogenschutz, M. P., Nakazawa, N., & Woody, G. (2013). Concordance between self-report and urine drug screen data in adolescent opioid dependent clinical trial participants. *Addictive Behaviors, 38*, 2568-2574.
- Woolfolk, A., & Margetts, K. (2013). Learning differences and learning needs. In A. Woolfolk & K. Margetts (Eds.), *Educational Psychology* (3rd ed., pp. 192-195). Frenchs Forest, NSW: Pearson.

Table 1

*Overall Prevalence of Substance Use Among High School Students by Gender and User Group With Percentages*

Substance		User Status						<i>p</i>
		User		Non-User		Ex-User		
		N	%	N	%	N	%	
Alcohol	Male	33	33	63	63	4	4	.74
	Female	36	37.1	56	57.7	5	5.2	
	Total	69	35	119	60.4	9	4.6	
Tobacco	Male	21	22	63	63	16	16	.62
	Female	22	22.7	55	56.7	20	20.6	
	Total	43	21.8	118	59.9	36	18.3	
Marijuana	Male	18	18	77	77	5	5	.24
	Female	12	12.4	75	73.3	10	10.3	
	Total	30	15.2	152	77.2	15	7.6	
Benzodi- -azepines	Male	1	1	98	98	1	1	.38
	Female	0	0	97	100	0	0	
	Total	1	0.5	195	99	1	0.5	
Cocaine	Male	3	3	94	94	3	3.6	.57
	Female	1	1	92	94.8	4	4.1	
	Total	4	2	186	94.4	7	3.6	
Crack	Male	2	2	95	93	3	3	.78
	Female	1	1	94	96.9	2	2.1	
	Total	3	1.5	189	95.9	5	2.5	
Ecstasy	Male	1	1	99	99	0	0	.98
	Female	1	1	96	99	0	0	
	Total	2	1	193	99	0	0	
Other Hallucinogen	Male	1	1	97	97	2	2	.38
	Female	1	1	95	99	0	0	
	Total	2	1	193	98	2	1	
Heroin	Male	2	2	97	95	1	1	.86
	Female	1	1	95	97.9	1	1	
	Total	3	1.5	192	97.5	2	1	
LSD	Male	1	1	96	96	3	3	.14
	Female	0	0	97	100	0	0	
	Total	1	0.5	193	98	3	1.5	
Poppers	Male	1	1	97	97	2	2	.38
	Female	1	1	96	99	0	0	
	Total	2	1	193	98	2	1	
Speed	Male	3	3	91	91.9	5	5	.17
	Female	0	0	94	96.9	3	3.1	
	Total	3	1.5	185	94.4	8	4.1	
Steroids	Male	1	1	97	97		2	.38
	Female	2	1	96	99	2	0	
	Total	1	1	193	98	0	1	
Uppers	Male	1	1	98	98	1	1	.61
	Female	1	1	96	99	0	0	
	Total	2	1	194	98.5	1	.5	
Volatile Substances	Male	0	0	96	96	4	4	.35
	Female	2	2.1	91	93.8	4	4.1	
	Total	2	1	18.7	94.9	8	4.1	

Table 2  
*Prevalence of Substance Use by Year Level (percentages in brackets)*

Substance	User Status						<i>p</i>
	Non-user		Ex-User		User		
	9	10	9	10	9	10	
Alcohol	71 (68.3)	48 (51.6)	5 (4.8)	4 (4.3)	28 (26.9)	41 (44.1)	.04*
Tobacco	72 (69.2)	46 (49.5)	9 (8.7)	27 (29)	23 (21.1)	20 (21.5)	.001**
Marijuana	85 (81.7)	69 (72)	4 (3.8)	11 (11.8)	15 (14.8)	15 (16.2)	.09
Benzodiazepine	102 (98.1)	93 (100)	1 (1.9)	0	1 (1.0)	0	.41
Cocaine	95 (93.3)	91 (97.8)	6 (5.8)	1 (1.1)	3 (2.9)	1 (1.1)	.13
Crack	97 (93.3)	92 (98.9)	4 (3.8)	1 (1.1)	3 (2.7)	0	.12
Ecstasy	101 (99)	92 (98.9)	0	0	1 (1)	1 (1.1)	.95
Other Hallucinogens	102 (98.1)	91 (97.8)	0	2 (2.2)	2 (1.9)	0	.13
Heroin	100 (96.2)	92 (98.9)	2 (1.9)	0	2 (1.9)	2 (1.1)	.36
LSD	103 (99)	90 (96.8)	1 (1)	2 (2.2)	0	1 (1.1)	.45
Poppers	103 (99)	90 (96.8)	1 (1)	1 (1.1)	0	2 (2.2)	.32
Speed	99 (96.1)	86 (92.5)	2 (1.9)	6 (6.5)	2 (1.9)	1 (1.1)	.25
Steroids	103 (99)	90 (96.8)	0	2 (2.2)	1 (1)	1 (1.1)	.32
Uppers	102 (98.1)	92 (98.9)	1 (1)	0	1 (1)	1 (1)	.64
Volatile Substances	100 (96.2)	87 (93.5)	3 (2.9)	5 (5.4)	1 (1)	1 (1.1)	.67

Note. \* <.05  
 \*\* <.01

Table 3  
*Prevalence of Substance Use by LD Groups (with percentages in bracket)*

Substance	User Status						<i>p</i>
	Non-user		Ex-User		User		
	LD	NLD	LD	NLD	LD	NLD	
Alcohol	34 (45.9)	85 (69.1)	2 (2.7)	7 (5.7)	38 (51.4)	31 (25.2)	.001**
Tobacco	39 (52.7)	79 (64.5)	15 (0.3)	21 (17.1)	20 (27)	23 (18.7)	.23
Marijuana	83 (71.76)	99 (80.5)	5 (6.8)	10 (8.1)	16 (21.6)	14 (11.4)	.15
Benzo diazepine	73 (98.6)	122 (92.2)	1 (1.4)	0	0	1 (0.8)	.32
Cocaine	70 (94.6)	116 (94.3)	3 (4.1)	4 (3.3)	1 (1.4)	3 (2.4)	.84
Crack	70 (94.6)	119 (96.7)	2 (2.7)	3 (2.4)	2 (2.7)	1 (0.8)	.57
Ecstasy	71 (98.6)	122 (99.2)	0	0	1 (1.4)	1 (.08)	.7
Other Hallucinogens	72 (97.3)	121 (98.4)	1 (1.4)	1 (0.8)	1 (1.4)	1 (0.8)	.87
Heroin	72 (97.3)	120 (97.6)	1 (1.4)	1 (0.8)	1 (1.4)	2 (1.6)	.93
LSD	71 (95.9)	122 (99.2)	2 (2.7)	1 (.8)	1 (1.4)	0	.28
Poppers	72 (97.3)	121 (98.4)	1 (1.4)	1 (.8)	1 (1.4)	1 (.8)	.87
Speed	66 (90.4)	119 (96.7)	6 (8.2)	2 (1.6)	1 (1.4)	2 (1.6)	.07
Steroids	71 (95.9)	122 (99.2)	2 (2.7)	0	1 (1.4)	1 (.8)	.17
Uppers	72 (97.3)	122 (99.2)	1 (1.4)	0	1 (1.4)	1 (.8)	.40
Volatile Substances	69 (93.2)	118 (95.9)	5 (6.8)	3 (2.4)	0	2 (1.6)	.19

Note. \*\*  $p < .01$



Table 4

*Prevalence of Substance Use for LD Group by Gender for User group (with percentages in brackets)*

Substance	LD		NLD		<i>p</i> value
	Male	Female	Male	Female	
Alcohol	26 (37.7)	12 (17.4)	7 (10.1)	24 (34.8)	.001**
Tobacco	14 (32.6)	6 (14)	7 (16.3)	16 (37.2)	.01*
Marijuana	13 (43.3)	3 (10)	5 (16.7)	9 (30)	.02*
Ecstasy	0	1 (50)	1 (50)	0	.16
Cocaine	1 (25)	0	2 (50)	1 (25)	.5
Crack	1 (33.3)	1 (33.3)	1 (33.3)	0	.39
Other Hallucinogens	1 (50)	0	0	1 (50)	.16
Heroin	0	1 (33.3)	2 (66.7)	0	.08
LSD	1 (50)	0	0	1 (50)	.16
Poppers	1 (50)	0	0	1 (50)	.16
Steroids	0	1 (50)	1 (50)	0	.16
Uppers	1 (50)	0	0	1 (50)	.16
Volatile Substances	0	0	2 (50)	2 (50)	.09

Note: \*  $p < .05$ \*\*  $p < .01$