

Predicting Substance Use from Childhood Aggression and Prosocial Behaviour

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ABSTRACT

This research uses a longitudinal design to examine aggression and prosocial behaviour as early predictors of substance use behaviours in emerging adulthood. Using data from the National Longitudinal Survey of Children and Youth (NLSCY), self- and maternal reports of early engagement in relationally and physically aggressive behaviours and prosocial behaviours are examined as predictors of cigarette smoking, marijuana use, and alcohol use in emerging adulthood. Using multinomial regression analyses we found that maternal reports of relational aggression significantly predicted daily smoking whereas self-reports did not. Maternal reports of relational and physical aggression did not predict alcohol use and marijuana use; however, self-reports of relational aggression and prosocial behaviour predicted weekly marijuana use in this representative Canadian sample.

Keywords: relational aggression, physical aggression, substance use, emerging adulthood

RÉSUMÉ

Cette recherche utilise un modèle longitudinal pour examiner l'agression et le comportement prosocial comme prédicteurs précoces des comportements de consommation d'alcool et d'autres drogues chez les jeunes émergents à l'âge adulte. En utilisant les données de l'Enquête longitudinale nationale sur les enfants et les jeunes (ELNEJ), l'évaluation de la mère et l'autoévaluation de l'utilisation précoce de comportements agressifs sur les plans relationnel et physique et de comportements prosociaux sont examinés comme facteurs prédictifs de l'usage de la cigarette, de la consommation de marijuana et de la consommation d'alcool pour notre échantillon d'adultes émergents. Des analyses de régression multinomiale, nous avons constaté que l'évaluation de la mère de l'agression relationnelle prédit de façon significative le tabagisme quotidien tandis que les autoévaluations ne le prédisent pas. L'évaluation maternelle de l'agression relationnelle et physique

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The authors gratefully acknowledge the support of the Social Sciences and Humanities Research Council for funding this research and the support of Jean-Michel Billette for the statistical guidance. We thank the Research Data Centre, Human Resources Development Canada, and Statistics Canada for providing access to the NLSCY (Human Resources Development Canada & Statistics Canada, 1996). Finally, we are grateful to two anonymous reviewers for their suggestions on an earlier version of this manuscript.

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ne prédit pas la consommation d'alcool, ni de marijuana. Cependant, les auto-évaluations de l'agression relationnelle et des comportements prosociaux prédisent l'utilisation hebdomadaire de marijuana dans cet échantillon représentatif du Canada.

Mots clés : agression relationnelle, agression physique, consommation d'alcool et d'autres drogues, émergence de l'âge adulte

Cigarette, alcohol and marijuana use are fairly commonplace behaviours among Canadian youth with 16% of 15–24-year-olds being current smokers (Health Canada, 2012), nearly 71% of 15–24-year-olds having consumed alcohol, and 21.6% of Canadian youth having used cannabis according to the most recent Health Canada report (Health Canada, 2011). When experimentation or past use is considered, these numbers rise to over 34% of youth having used cannabis in their lifetime and almost 80% of Canadian youth having consumed alcohol in their lifetime. Accordingly, a recent editorial in the Canadian Medical Association Journal advocated for a national strategy to curb binge drinking because rates in Canada are so disconcertingly high (Flegel, MacDonald, & Hébert, 2011). It is important to consider factors that might lead to substance use behaviours in the Canadian population so that we may design and implement evidence-based policies and programs relevant to Canadians.

Importantly, when gender is considered, Canadian men are significantly more likely than Canadian women to engage in heavy frequent drinking (7% versus 1.8%; Health Canada, 2011). These statistics represent all age groups, however for the age group of interest (youths aged 15–24 years), 9.4% of Canadian youth engaged in heavy frequent drinking, almost three times the rate of adults 25 years or older. Given these trends in substance use among Canadian youth, determining factors that may be areas of opportunity for prevention or intervention is important.

Many researchers have suggested an association between substance use and aggressive behaviour. In fact, physical aggression has been referred to as the “best predictor of late adolescent engagement in health risk behaviours” including substance use (Timmermans, van Lier, & Koot, 2008, p. 392). The research of Timmermans and colleagues replicated earlier work on physically aggressive behaviours and substance use, wherein the researchers found that the related construct of conduct disorder predicted alcohol and marijuana use in an emerging adulthood sample (White, Xie, Thompson, Loeber, & Stouthamer-Loeber, 2001). These findings are compelling and yet it is unclear to what degree physically aggressive behaviours predict later substance use behaviours compared to relationally aggressive behaviours, a subset of aggression that has received much research attention over the last two decades.

Relational aggression is a form of aggression where relationships are used to cause harm through friendship manipulation, rumour spreading, and exclusion from social experiences (Crick & Grotpeter, 1995). Many consequences of relational victimization have been noted in previous research, such as a reduction in self-esteem and increased involvement in delinquent behaviour (Carbone-Lopez, Esbensen, & Brick, 2010) but some research has focused on consequences for aggressors (see for example a meta-analysis by Card, Stucky, Sawalani, & Little, 2008 that examines this). Much of the research on consequences for aggressors has focused on internalizing difficulties (e.g., subclinical or clinical levels of depression and anxiety).

Although relational aggression is more strongly and uniquely associated with internalizing difficulties than physical aggression, the meta-analysis by Card et al. also shows that this form of aggression has unique associations with conduct problems and rejection by peers. The personal and greater societal cost of this form of aggression is clear and as the amount of research increases there may even be more to consider, especially as many of these outcomes have not been longitudinally tested in a Canadian population. Further, some of the experiences that are highly correlated with relational aggression (e.g., depression, loneliness, anxiety) allude to the potential for the development of alcohol, drug and cigarette use and dependency.

There is growing evidence that the perpetration of relational aggression may be associated with substance use behaviours. Weiner (2006) investigated adolescents' self-reports of engagement in relational and overt aggression as predictors of drug use and found that both types of aggression were predictors of lifetime engagement in cigarette, alcohol and marijuana use in this American sample. Likewise, Schmidt (2004) found that engagement in relational and overt forms of aggression predicted alcohol use in a longitudinal sample of American adolescents. Some research has also indicated that engagement in relational aggression may also be linked to alcohol use among women (Storch, Bagner, Geffken, & Baumeister, 2004). These findings indicate there is a relationship between aggression and substance use, but this has not been examined longitudinally in a Canadian population. In order to design evidence-based programs and policies to address issues such as this one in a country as large and diverse as Canada, it is important to understand the issues as they relate to Canadians. As the National Longitudinal Survey of Children and Youth was specifically designed to address the gap in Canadian-specific knowledge of factors pertaining to child and adolescent development, the use of this survey to investigate these issues is necessary.

In contrast to aggressive behaviours (i.e., behaviours that may hurt others), prosocial behaviours are those intended to help others, including helping, sharing, cooperating and comforting (Jackson & Tisak, 2001). In the current study, prosocial behaviours were examined in the same manner as aggressive behaviours, so that we were able to compare the associations found between aggressive behaviours and substance use with those found between prosocial behaviours and substance use. We hypothesized that both forms of aggression (relational and physical) in childhood would predict smoking, drinking, and marijuana use in emerging adulthood given the evidence that problem behaviours tend to co-occur (Jessor, 1987). Although relational aggression and physical aggression are strongly correlated, they may be differentially related to the use of substances. They were examined as separate constructs as has been advocated in prior research (see for example, Card et al., 2008). Comparatively, it was unclear whether prosocial behaviours in early childhood would predict substance use behaviours in emerging adulthood given the lack of research on this topic, therefore this analysis is exploratory.

METHOD

Using data from the National Longitudinal Survey of Children and Youth (NLSCY), we examined relational and physical aggression as well as prosocial behaviours at ages 10–11 as predictors of cigarette smoking, marijuana use, and alcohol use at ages 20–21. The NLSCY is a nationally representative survey of a broad range of aspects related to development for Canada's non-institutionalized children and youth (excluding Territories and Northern regions, children living on First Nation Reserves, Crown Lands, and full-time members of the Canadian Armed Forces). The NLSCY is sponsored by Human Resources Development Canada and Statistics Canada. Every two years beginning in 1994–95 (cycle 1) data have been collected

from children age 10 and older and the person most knowledgeable (PMK)—most often the mother of the child. Cycle 6 (when the original cohort was aged 20 and 21) was sampled in 2004–5 and this cycle along with the first collected cycle was used in the current study.

Participants

A longitudinal cohort of children from the NLSCY was examined in the present study. Only participants with complete data were used in each model and as such the number of participants for each model is different.

Measures

Self-report and PMK-report measures of relationally aggressive behaviour, physically aggressive/conduct-disordered behaviour (which together make up a single scale in this dataset), and prosocial behaviour were used as predictor variables. Information for the predictors was collected from both the participant and PMK at cycle 1 when participants were 10–11 years old. Self-report measures of smoking, marijuana use, and alcohol use were used as outcome variables. These measures were collected at cycle 6 when participants were 20–21 years old. In addition, the role of gender and socioeconomic status were explored in the models. A detailed description of measures collected for all cycles of data can be found on the Statistics Canada website (Statistics Canada, 2010). Cronbach's α for these scales ranged from 0.73 to 0.82.

Covariates. Gender and socioeconomic status were entered into each model as covariates due to established associations of these variables with aggressive behaviour and substance use. Socioeconomic status was assessed with an NLSCY factor score (a composite score based on the education and occupation of the PMK and spouse as well as household income).

Statistical Analyses

Multinomial logistic regression analyses were conducted for each of the outcome variables with the category of “never” used as the base outcome. Self-report measures and PMK measures were analyzed in separate models, therefore six regression analyses were conducted. Next, significant predictors for each of the regression models were tested again for each outcome. For each regression, socioeconomic status (SES) and gender were included in the model as covariates. Bootstrap weights were used to provide robust variance estimation and to adjust for clustering and stratification (Yeo, Mantel, & Liu, 1999) so that the results would be representative of the Canadian population.

RESULTS

Descriptive Analyses

Percentages of participants who reported substance use behaviours at ages 20–21 are presented in Table 1. Of particular interest are the substantial number of young Canadians reporting current occasional or daily smoking (almost 30%), binge drinking (whether less than once per week or once or more per week within the last year; almost 80%) and current marijuana use (including those who responded between rare and daily use; almost 47%). These statistics are somewhat higher than those reported by Health Canada (2011).

Table 1
Percentage of Participants who Reported Engaging in Substance Use Behaviours at Ages 20–21

Variable	Percent of sample
Smoking	
Non-smoker	70.15
Occasional	8.40
Daily	21.46
Drinking more than 5 drinks per occasion in the past 12 months	
Never	20.46
Less than once per week	61.65
Once or more per week	17.89
Marijuana use	
Never	53.06
Rare (less than once per month)	22.50
Occasional (1 to 3 times per month)	8.07
Often (1 to 6 times per week)	10.32
Daily (use every day)	6.06

Gender Differences

Independent samples *t*-tests were used to compare reported engagement in smoking, binge drinking, and marijuana use between males and females. There was no significant difference in smoking scores between males and females ($p = 0.41$), but there were differences in scores for binge drinking and marijuana use. Males were significantly more likely to binge drink ($M = 2.09$) than females ($M = 1.85$), $t = 4.54$, $p < 0.001$ as well as use marijuana ($M = 1.17$) than females ($M = 0.69$), $t = 4.86$, $p < 0.001$.

Regression Analyses for PMK Reports

Smoking. A total of 1,305 participants were included in the PMK smoking model, estimating a Canadian population size of 704,877. The relative risk ratios (RRR) for the smoking models are presented in Table 2. PMK reports of relational aggression significantly predicted reports of daily ($RRR = 1.21$, $p = 0.002$), but not occasional smoking behaviour ($RRR = 1.07$, $p = 0.412$) as compared to non-smoking behaviour.

These results indicate that the higher a PMK reports a child on the relational aggression scale the more likely that child is to become a daily smoker in emerging adulthood. SES predicted daily smoking behaviour for this model as well ($RRR = 0.73$, $p = 0.04$) in that having lower SES predicted membership in the daily smoking groups as compared to non-smokers.

Table 2
Relative Risk Ratios for the Smoking Outcome (Final Models)

Smoking	RRR	BRR Std. Err.	<i>t</i>
PMK Reports (<i>n</i> = 1,305; weighted <i>n</i> = 704,877)			
Occasionally			
Relational aggression	1.07	.09	.82
SES	.93	.24	-.27
Daily			
Relational aggression	1.21	.07	3.16*
SES	.73	.11	-2.13*
Self-Reports (<i>n</i> = 1,181; weighted <i>n</i> = 604,320)			
Occasionally			
Relational aggression	1.07	.09	.83
Physical aggression	1.06	.12	.56
Prosocial behaviour	1.06	.05	1.25
Gender	.98	.34	-.07
SES	.87	.23	-.51
Daily			
Relational aggression	1.08	.07	1.16
Physical aggression	1.12	.09	1.49
Prosocial behaviour	1.06	.05	1.29
Gender	.92	.24	-.33
SES	.56	.09	-3.61***

Note. "not at all" is the base outcome.

* $p < 0.05$. *** $p < 0.001$.

Binge drinking. A total of 1,218 participants were included in the PMK binge drinking model, reflecting a Canadian population size of 655,621. PMK reports of relational aggression, physical aggression and prosocial behaviour were not predictive of binge drinking (see Table 3). Gender was a significant predictor for this model in that males were more likely to be frequent (i.e., once or more per week) binge drinkers ($RRR = 0.25$, $p < 0.001$).

Marijuana use. A total of 1,292 participants were included in the PMK marijuana use model, reflecting a Canadian population size of 699,047. Gender and socioeconomic status were the only significant predictors in this model with higher SES predicting rare use ($RRR = 1.42$, $p = 0.007$), and being male predicting frequent use ($RRR = 0.35$, $p = 0.001$) as well as daily use ($RRR = 0.23$, $p = 0.003$).

Table 3
Relative Risk Ratios for the Binge Drinking Outcome (n.s.)

Binge drinking	RRR	BRR Std. Err.	<i>t</i>
PMK-Reports (<i>n</i> = 1,218; weighted <i>n</i> = 655,621)			
Less than once per week			
Relational aggression	1.07	.08	.93
Physical aggression	.88	.07	-1.58
Prosocial	1.02	.04	.52
Gender	.61	.17	-1.80
SES	1.17	.20	.93
Once or more per week			
Relational aggression	1.03	.10	.34
Physical aggression	.89	.09	-1.25
Prosocial	.95	.05	-1.10
Gender	.26	.08	-4.22***
SES	1.40	.29	1.62
Self-Reports (<i>n</i> = 1,112; weighted <i>n</i> = 566,796)			
Less than once per week			
Relational aggression	1.04	.08	.52
Physical aggression	1.02	.09	.24
Prosocial	1.00	.04	.04
Gender	.78	.26	-.74
SES	1.12	.22	.62
Once or more per week			
Relational aggression	.95	.09	-.53
Physical aggression	1.18	.11	1.84
Prosocial	.99	.06	-.23
Gender	.33	.12	-2.94**
SES	1.40	.32	1.47

Note. "never" is the base outcome.

** $p < 0.01$. *** $p < 0.001$.

Regression Analyses for Self-Reports

Smoking. A total of 1,181 participants were included in the self-report smoking model, reflecting a Canadian population size of 604,320. SES predicted daily smoking behaviour for this model ($RRR = 0.56$, $p < 0.001$), in that having a lower SES predicted membership in the daily smoking groups as compared to non-smokers. No other predictors were significant for this model.

Binge drinking. A total of 1,112 participants were included in the self-report binge drinking model, reflecting a Canadian population size of 566,796. Gender was the only significant predictor for this model, in that males were more likely to be frequent (i.e., once or more per week) heavy drinkers ($RRR = 0.31, p = 0.002$).

Marijuana use. A total of 1,176 participants were included in the self-report marijuana use model, reflecting a Canadian population size of 602,660. Relative risk ratios for the marijuana use models are presented in Table 4. Self-reports of relational aggression ($RRR = 1.34, p = 0.001$), prosocial behaviour ($RRR = 1.15, p = 0.03$) and gender ($RRR = 0.23, p < 0.001$) predicted frequent marijuana use (defined as once or more per week) in that reporting higher relational aggression, higher prosocial behaviour and being male was associated with increased risk of frequent marijuana use as compared to those who reported never using marijuana. Further, self-reports of higher physical aggression predicted daily use of marijuana ($RRR = 1.30, p = 0.04$) as did being male ($RRR = 0.34, p = 0.04$) compared to those who never used marijuana.

DISCUSSION

The objective of this study was to examine whether childhood relational and physical aggression and prosocial behaviour could predict later substance use (smoking tobacco, binge drinking, and using marijuana) in a Canadian sample of children and youth. We found that PMK reports of relational aggression significantly predicted daily smoking whereas self-reports did not. PMK reports of relational and physical aggression did not predict alcohol use and marijuana use. However, self-reports of relational aggression and prosocial behaviour predicted weekly marijuana use. These findings are explored next.

Predicting Cigarette Use

Children whose PMK said they used more relationally aggressive behaviours at 10–11 years old were more likely to become daily smokers by ages 20–21. Highly relationally aggressive children and youth, though often rated highly on peer-perceived popularity, tend to be more disliked (Cillessen & Mayeux, 2004; Crick & Grotpeter, 1995) and rejected by peers (Lee, 2009). At a higher-than-usual risk for social rejection, these individuals may be more likely to engage in habitual smoking in an attempt to cope with this negative experience. Relational aggression has also been associated with loneliness, depression, and isolation in previous research (Crick & Grotpeter, 1995) and these may be contributing factors to engagement in daily smoking behaviour as well. Daily smoking in emerging adulthood may be engaged in for its function as a coping behaviour to ease negative emotions and anxiety (Brook et al., 2008; Moolchan, Ernst, & Henningfield, 2000). Future research may find that peer rejection plays a mediating role to the association between relational aggression and substance use behaviours.

Given the positive associations between peer-perceived popularity and relational aggression (Rose, Swenson, & Waller, 2004) as well as peer-perceived popularity and smoking (Valente, Unger, & Johnson, 2005), the association between relational aggression and smoking may be a function of the high status peer group. Membership in this group perceived as popular by peers may be over-represented by relationally aggressive individuals who smoke to maintain or enhance their popular reputations.

Table 4
Relative Risk Ratios for the Marijuana Use Outcome

Marijuana Use	RRR	BRRR Std. Err.	<i>t</i>
PMK Reports (<i>n</i> = 1,292; weighted <i>n</i> = 699,047)			
Rarely			
Relational aggression	1.11	.08	1.59
Physical aggression	.88	.07	-1.70
Prosocial	1.01	.03	.22
Gender	.86	.20	-.66
SES	1.42	.18	2.73**
Occasionally			
Relational aggression	1.10	.18	.59
Physical aggression	.93	.12	-.58
Prosocial	1.01	.49	.15
Gender	.59	.20	-1.52
SES	1.19	.25	.84
Often			
Relational aggression	1.05	.10	.57
Physical aggression	1.09	.11	.81
Prosocial	1.06	.05	1.28
Gender	.34	.11	-3.25***
SES	.95	.20	-.24
Daily			
Relational aggression	1.11	.14	.82
Physical aggression	1.06	.10	.55
Prosocial	.94	.05	-1.16
Gender	.23	.11	-3.01**
SES	.94	.21	-.29
Self-Reports (<i>n</i> = 1,176; weighted <i>n</i> = 602,660)			
Rarely			
Relational aggression	1.06	.07	1.06
Physical aggression	.98	.08	-.23
Prosocial	.96	.03	-1.25
Gender	1.10	.27	.37
SES	1.50	.20	3.04**
Occasionally			
Relational aggression	1.11	.13	.88
Physical aggression	1.11	.14	.79
Prosocial	1.07	.07	1.03
Gender	.65	.31	-.90
SES	1.13	.23	.59
Often			
Relational aggression	1.34	.12	3.39***
Physical aggression	1.04	.11	.38
Prosocial	1.15	.08	2.20*
Gender	.23	.09	-3.70***
SES	1.04	.25	.15
Daily			
Relational aggression	1.03	1.19	.16
Physical aggression	1.30	.17	2.03*
Prosocial	1.02	.07	.26
Gender	.34	.18	-2.03*
SES	1.02	.23	.07

Note. "never" is the base outcome.

* $p < 0.05$. *** $p < 0.001$.

Research over the last decade has linked popularity and relationally aggressive behaviours (Cillessen & Borch, 2006; Rose, Swenson, & Carlson, 2004; Sandstrom & Cillessen, 2006) and recent research has shown that smoking may result in increases in a child's peer-perceived popularity over time (Mayeux, Sandstrom, & Cillessen, 2008). It was therefore surprising to find that early relationally aggressive behaviour did not predict occasional smoking behaviour in emerging adulthood. As they may share similar goals, youth may not consider the use of *both* relationally aggressive behaviours and occasional smoking necessary to achieve their desired social status and may engage in one behaviour or the other. Occasional smoking is a less frequent and perhaps more social type of smoking behaviour, and clearly has predisposing factors other than early aggressive and prosocial behaviours.

Also interesting was that PMK reports of relational aggression predicted smoking behaviour but self-reports of relational aggression did not. Individuals rated highly relationally aggressive by their PMK might also be less effective in their use of relational aggression, thereby not concealing their behaviours from adults quite as well as their relationally aggressive counterparts who are not rated as highly aggressive by adults (as one of the major goals of relational aggression is to not get caught for their behaviour; Delveaux & Daniels, 2000). It may be that these less effective relational aggressors are trying to find other ways (e.g., smoking with their friends) to enhance their sense of intimacy and belonging to the peer group from which they may feel excluded as a consequence of their behaviour that somewhat alienates them from their group. Future research should endeavour to understand what differentiates children who report that they are relationally aggressive from children whose PMK reports they are relationally aggressive in order to determine whether it is their level of effectiveness at using the behaviours.

While early in the smoking acquisition process, engagement in smoking to gain social benefits may more likely to lead to experimental or occasional smoking, this group may gradually progress to a more stable and regular pattern such as daily smoking. This may be a consequence of the effects of nicotine as a self-medication tool in coping with emotional states such as anxiety, depression and loneliness (Brook et al., 2008; Moolchan et al., 2000). Therefore, while adolescents are initially attracted to cigarette smoking for its social appeal, those who struggle with emotional issues may be more likely to develop nicotine dependence (i.e., become daily smokers) because of the self-medicating properties of nicotine.

Predicting Binge Drinking

It is particularly intriguing that aggressive behaviours were predictive of smoking and marijuana use, but not predictive of binge drinking. This could be because alcohol use is so common in emerging adulthood that it cannot be predicted by aggressive behaviours in a child's early years. This finding may be particularly important in contributing to the literature on consequences of alcohol use in that it indicates quite clearly that the association between aggressive behaviours and binge drinking is not present before the onset of binge drinking but may arise as one of its consequences (Bushman & Cooper, 1990; Foran & O'Leary, 2008). Further, consistent with the Health Canada report (2008), males were more likely to be frequent binge drinkers than females. Clearly more research should focus on what drives young men to binge drink on a more frequent basis.

The lack of findings to predict binge drinking in this study could also be a function of Canadian customs and laws around the acceptability of drinking. Perhaps the definition of binge drinking is not stringent enough to warrant examination of problematic correlates like aggressive behaviour. Future researchers may wish to consider a more stringent definition of binge drinking, perhaps determining whether associations with aggressive or other deviant behaviours exist when considering a cutoff of six, seven, or more drinks on any given occasion.

Frequency of Marijuana Use

Children who rated themselves highly on relational aggression at ages 10–11 were more likely to use marijuana once or more per week at ages 20–21. It has been proposed that acting in a relationally aggressive way is a product of a culture that puts pressure on girls to act or look nice, even when they are feeling angry (Underwood, 2003). It is likely that this pressure can be extended to boys as well as children are often expected to suppress their anger (Brown, 1998, 2003; Underwood, 2003) and children are often punished for showing outward, direct aggression but not for using more covert strategies to express aggression (Quigley, Summers, & Daniels, 2007). Boys have been largely ignored in theory on relational aggression, likely due to the popular culture perception that only girls use this behaviour, a notion that has been largely disproved by meta-analyses on the subject (Card et al., 2008). Perhaps the explanation for this particular outcome is that individuals who use relationally aggressive behaviours in late childhood are more conflicted by pressures such as those described above and thus, in their later years turn to substance use that alleviates worry of this pressure or conflict. More research is needed to substantiate these explanations.

Alternatively, self-reports of physical aggression predicted daily use of marijuana. In past research, marijuana use has been noted as an antecedent to violent behaviour (Moore et al., 2008; Stuart et al., 2008), but connecting physically aggressive behaviour as a precursor to marijuana use is an association not yet studied. It may be that these aggressive individuals seek a way of self-regulation and self-calming and turn to external substances that achieve this end. Another possible explanation is that physically aggressive individuals are typically members of more deviant peer groups and these groups may be more likely to use drugs more consistently than their less-deviant peers. Further research should be aimed at substantiating these hypotheses by studying aggressive and non-aggressive marijuana users and their social circles.

Interestingly, those who rated themselves highly on prosocial behaviour at ages 10–11 were more likely to use marijuana once or more per week in emerging adulthood. Frequent marijuana users in this study are individuals who considered themselves to be helpful, kind and concerned for others and this finding is in line with previous research on the subject (Hogan, Mankin, Conway, & Sherman, 1970). It may be that marijuana is a drug that is attractive to individuals with this disposition or personality type but clearly more research is needed to address the underlying reasons for this finding.

Consistent with reports by Health Canada (2008), men were more likely to use marijuana regularly than women were. Health Canada indicates that twice as many Canadian men as Canadian women reveal having used marijuana in the past 3 months (15.4% of men compared to 7.2% of women). Clearly there is a need for more research in this area, in order to determine what factors may lead to young men and women's use of marijuana.

Discrepancy in Predictability of Self-Report and PMK Report Measures

An interesting result in this study was the discrepant findings between the child and PMK reports of predictor variables, a common finding in research with multiple reports of the same behaviour (Cappella & Weinstein, 2006). While it is true that the dependent and independent measures sharing a common method will be more highly related than dependent and independent measures with different method variance, the discrepancies still inspire the question: who has the more accurate perception of a child's actual behaviour at this age? *Persons most knowledgeable* may in fact not be the most knowledgeable sources on the social interactions of the child especially when these occur in the context of the peer group. As Ziegler and Rosenstein-Manner (1991, as cited in Ahmed & Braithwaite, 2004, p. 49) noted, parents may only be aware of the more extreme and frequent bullying events and situations. Indeed, the PMK can only have a truly accurate picture of the child's behaviour from the way she or he acts at home or elsewhere where the PMK is present. It is clear that there are differences in perceptions of behaviour between the individual child and the PMK, and clearing up these differences may prove to be a futile endeavor. As Cappella and Weinstein (2006) point out, these types of reports "remain perceptions of behaviour, not actual behaviour" (p. 453). It is important to note that we used these perceptions to bolster our understanding of substance use and aggressive behaviours in this Canadian sample.

Limitations

Though the strengths of using a survey such as the NLSCY are many (e.g., findings are nationally representative and thus we can draw conclusions that are general to the Canadian population), this practice has some limitations, especially with regard to measuring variables. The variables available in the NLSCY are limited to a more general set. There is no opportunity to delve deeper into aggression and substance use behaviours to consider, for example, specifically what it is about relational aggression and prosocial behaviour that predict marijuana use. As Hay (1994) pointed out, individuals who use prosocial behaviours may realize some benefit for their use. The study of prosocial behaviours has been enriched by the work of Boxer, Tisak, and Goldstein (2004) who have made distinctions between two prosocial behaviour types: proactive prosocial behaviour and altruistic prosocial behaviour. Culotta and Goldstein (2008) note, "Proactive prosocial behaviour is motivated by the expectancy of a desired outcome from the behaviour, whereas altruistic prosocial behaviour is not motivated by a desired goal and occurs voluntarily without provocation" (p. 23). Proactive prosocial behaviours can share common goals with relationally aggressive behaviours despite the difference in means used to achieve those goals. This implies that individuals can use prosocial behaviours with the aim of gaining something in return, whether that is a material or social gain (e.g., an invitation to a birthday party, compliance from peers, heightened social status, etc.). Future research should consider delving deeper into the associations found in the current study with careful attention to nuances such as this one that may be present in the variables.

IMPLICATIONS FOR INTERVENTION

Considering the potential adaptive function of aggression in the lives of children, it has been theorized that relational aggression especially may serve an adaptive purpose, particularly within the lives of girls, in that it aids in creating group cohesion and intimacy between friends (Sippola, Paget, & Buchanan, 2007). It

must not be overlooked, however, that these “benefits” are always at the expense of another person. Some may argue that relational aggression cannot be considered under the realm of problem behaviour (as explored by Chesney-Lind, Morash, & Irwin, 2007). However, it is our opinion that regardless of the potential adaptive function this behaviour has, relational aggression should be considered problematic behaviour because it is used to harm another person. Effective interventions may curb relationally aggressive behaviours and teach children and youth alternative strategies to obtain their goals. The findings from this study may suggest that these interventions may have an effect on some substance use behaviours as well. There is now even more evidence to intervene with a relationally aggressive child as parents who are aware of this aggressive behaviour had children who engaged in smoking more regularly in early adulthood. While there are clearly other variables to consider in this association, it may be indicative of other problematic outcomes as well.

When trying to understand and intervene with individuals who use substances, the evidence that has been generated in this paper about early predictors of substance use for the Canadian population can be taken into consideration in so far as it is later associated with aggressive behaviour. While these associations will not be true for all who engage in these behaviours, they may help researchers and practitioners understand why early aggressive behaviour may be problematic. Early aggressive behaviour should be examined to determine what is underlying the behaviour, and alternative strategies should be sought out to achieve the goals of the behaviour. Canadian children who use substances to cope with negative emotions or peer rejection, or to gain acceptance with a deviant or popular peer group, may be encouraged to try alternate strategies of fitting in and coping that may still meet their goals while keeping them safer emotionally and physically.

CONCLUSION

Clearly there are negative associations with engagement in childhood aggression. This study indicates that childhood relational aggression predicts daily smoking and frequent marijuana use and childhood physical aggression predicts daily marijuana use. Of particular concern is that prosocial behaviour predicts frequent marijuana use as well. It is of utmost importance to gain insight into why children who identify themselves as kind and helpful to others have greater risk of being included in the frequent marijuana user category. Potential mediators and moderators of these associations such as contextual and environmental variables, peer status, or individual and personality characteristics should be considered in future studies.

This paper has explored a number of problem behaviours that are, in some circumstances, predictive factors for the use of different substances. It is evident that these differences should be carefully considered in future studies. The clustering of problem behaviours is one way to examine them but there is much to be learned by considering them separately.

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