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Pathways among Abuse, Daily Hassles, Depression, and Substance Use in Adolescents

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Currently, high school drug education programs lack information about the relationship between negative life events and substance use. The research described here was designed to explore the relationships between the experience of abuse (physical, sexual, and emotional), daily hassles, depression, and adolescent drug usage. A questionnaire including measures of abuse (Juvenile Victimization Questionnaire), daily hassles (Inventory of High-School Students Recent Life Experiences), depression (Center for Epidemiological Studies Depression Scale), and substance use (Nova Scotia Drug Survey) was completed by 112 male and 78 female high school students. The findings supported the self-medication hypothesis and indicated that both abuse and daily hassles were related to the use of substances (e.g., alcohol and non-medical use of prescription drugs) and that the relationship between daily hassles and substance use was mediated by depression. In turn, the use of alcohol and non-medical use of prescription drugs increased the likelihood of illicit drug use. Drug education strategies that emphasize the importance of coping skills and the role of depression as an antecedent to drug use are discussed.

Keywords: substance use, daily hassles, abuse, depression, self-medication

The social and psychological costs associated with drug use among adolescents are of great concern. Recent findings indicate that adolescents are developing more positive attitudes toward drug use, which is partly evidenced by the growing use of more dangerous drugs such as methamphetamines and Oxycodone (Covell, 2004; Haans & Hotton, 2004). In Canada, there has been an upward trend since the 1990s in adolescents' use of marijuana, alcohol, and non-medical use of prescription drugs (Haans & Hotton, 2004; Pacific Community Resources, 2002). Moreover, increasing numbers of high school students are using marijuana at the expense of family relationships and performance at school (Butters, 2005). Drug use in adolescence has been found to be associated with poor academic achievement and early school dropout, conflict with the law, and a higher risk of contracting sexually transmitted infections, including HIV/AIDS (Diego, Field, & Sanders, 2003; Gilvarry, 2000; Whitbeck, Hoyt, & Bayo, 2000; Lynskey, Coffee, Degenhardt, Carlin, & Patton, 2003). Unfortunately, research has indicated that current programs are ineffective and have done little to lessen the prevalence of drug experimentation or the quantity of drugs used (Hawkins, 1999; Sigelman et al, 2003).

Current iterations of drug prevention programs tend to focus on the role of normative and socially motivated drug use while downplaying the possibility that some adolescents use drugs to cope with life difficulties (Arthur & Blitz, 2000). That is, drug prevention programs focus on educating students about the harmful effects of drugs in the hope that such knowledge will deter usage (see Ennett, Tobler, Ringwalt, & Flewelling, 1994). Unfortunately, students who are using drugs to cope with life stressors may disregard admonitions to avoid harmful drugs. In fact, Butters (2005) proposes that the neglect of students who use drugs to cope with life stressors may be partly responsible for the ineffectiveness of current prevention programs. The current study was designed to highlight the importance of minor (e.g., daily stressors) and major (e.g., physical, sexual, and emotional abuse) life stressors in adolescent drug users by exploring the relationship between abuse, daily hassles, depression, and drug use.

In their self-medication hypothesis, Khantzian, Mack, and Schatzberg (1974) suggest that drugs are often used to cope with life stressors or the associated negative affect (i.e., depression). In either case, drugs are thought to be used to reduce negative emotional states (Deykin, Levy, & Wells, 1987; Tomlinson, Tate, Anderson, McCarthy, & Brown, 2005) or to replace stressful

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feelings with a "high" (Sinha, 2001). While some have questioned the causal direction of the self-medication hypothesis, most notably Halfors and colleagues (Halfors, Waller, Bauer, Ford, & Halpern, 2005), who argue that it is experimentation with substances that leads to or increases depression, the self-medication hypothesis receives considerable support in the literature (Carrigan & Randall, 2003). For example, drug use has been noted as a response to minor life stressors such as poor school performance and difficulties with social relationships (Moran, Vuchinich, & Hall, 2004), and major life stressors such as physical, sexual, and emotional abuse (Bailey & McCloskey 2005; Bergen, Martin, Richardson, Allison & Roeger, 2004). Whereas the link between the experience of abuse and later drug use is well documented in the literature (see Simpson & Miller, 2001 for a review), comparatively mundane daily experiences are understudied as antecedents of drug use. The current study explores links between drug use and daily hassles.

Briefly, daily hassles are defined as minor irritants and sources of stress that individuals commonly encounter in everyday life (Kanner, Coyne, Schaefer, & Lazarus, 1981). Common types of daily hassles experienced by high school students include disagreements with family, teachers, and friends, struggles to perform at school, and dissatisfaction with one's appearance and skills (Kohn, & Milrose, 1993). Research has suggested that such hassles are exceptionally prevalent in adolescents as these stressors tend to accompany the social, cognitive and psychological changes associated with this period of life (Elgar, Arlett, & Groves, 2003; Williams & McGillicudy De-Lisi, 2000). Unfortunately, insufficient attention has been paid to the effect of daily hassles on adolescent adjustment (e.g., depression) and antisocial behavior (e.g., substance use).

Whereas daily hassles research is limited, past findings suggest that adolescents experiencing high levels of daily hassles are more likely to smoke cigarettes (Guthrie, Young, Boyd, & Kintner, 2001) and drink alcohol (Baer, Garmezy, McLauglin, Pokorny, & Wernick, 1987) than those experiencing low levels of hassles. There is also some evidence that the experience of daily hassles, particularly those with peers and parents, is related to an increase in depression and antisocial behaviors in adolescents (Sim, 2000). Most concerning is the finding that, though abuse is implicated in the development of serious emotional turmoil (e.g., Posttraumatic Stress Disorder), daily stressors are better predictors of adolescent maladjustment (e.g., Compas, Howell, Phares, Williams, & Gunta, 1989). Thus, considered within the context of the self-medication hypothesis (Khantzian, 1974), it seems plausible that substance use may be better predicted by daily hassles than the experience of abuse.

It is important to note that the self-medication hypothesis (Khantzian et al., 1974) makes no claims regarding the specific substance(s) that adolescents may use to cope with stress. However, in their gateway drug hypothesis, Kandel and Faust (1975) suggest that the use of "soft" drugs (e.g., marijuana) increases the likelihood of subsequent use of "hard" drugs (e.g., methamphetamines). In particular, they propose a sequence of usage that begins with beer and wine, progresses to hard liquor and cigarettes, then marijuana, and results in the use of hard drugs such as cocaine and prescription drugs for non-medical reasons (Kandel & Faust, 1975). In other words, the gateway drug hypothesis suggests that an individual who drinks alcohol to cope significantly increases the likelihood that s/he will use "hard" drugs at some point in the future.

Hypotheses

This research was designed primarily as an exploratory study to identify the relationship between daily hassles, traumatic life events, and the use of various drugs in an adolescent population. In particular, it was expected that depression would mediate the relationship between traumatic life events and daily hassles and the subsequent use of substances. It was also expected that the measured substances would have differential relationships with traumatic life events and daily hassles. For example, socialization may lead adolescents to turn to alcohol and marijuana to cope with minor stressors (i.e., daily hassles) and turn to more serious mood-altering drugs (i.e., prescription medication) to cope with more traumatic experiences. A path analysis was used to explore these relationships.

Method

Participants

Due to the difficulties associated with recruiting adolescents, a convenience sample of eight high school

classrooms was used. Participants were recruited by contacting the principals of four high schools in semi-rural areas of Nova Scotia, Canada. In turn, each principal sought out teachers who were willing to have a researcher join the class for a period of 20 minutes to conduct a short survey with the students. This procedure resulted in eight classes of high school students (*N*=201) eligible to take part in the survey. Eleven surveys were discarded due to incomplete data. Of the resulting 190 participants, 112 were male and 78 were female. Approximately half of these students (52.1%) were in the 10th grade, 44.2% were in the 11th grade, and 3.7% were in the 12th grade. Their ages ranged from 15-19, with an average age of 16 years (*SD* = .84). The majority of the students were Caucasian, (97.4%), the others were either African Canadian or Native Canadian. Most (71.6%) lived with both biological parents, 15% lived with a single parent, 5% lived with foster parents and the remainder lived in a family with a stepparent.

Measures and Procedure

Prior to participation in the study, all students were informed of the purpose of the study, that participation was voluntary, and that all responses would be kept confidential. Specifically, the researcher ensured the students that they would not be asked to sign their name, that the questionnaires would be stored in a locked cabinet, and that only the primary researcher and his supervisor would have access to the data. The students were also asked to anonymously sign an informed consent form summarizing this information (i.e., they were asked to check a box indicating their understanding of the information and agreement to participate). Surveys were then distributed to all those who agreed to participate in the study (all those present so agreed). The survey consisted of a demographics questionnaire, four self-report measures that are detailed below, and the contact information of organizations for those adolescents requiring information about drugs or mental health.

The Juvenile Victimization Questionnaire (JVQ; Finkelhor, Hamby, Ormrod, & Turner, 2005) was used to assess participants' histories of physical, sexual, and emotional abuse. It is a 34-item questionnaire that measures the frequency with which adolescents aged 10-17 have experienced trauma. The JVQ was adapted from its original interview format to allow for self-report, and was reduced to 21-items. The 13 items that were removed were related to wartime traumas. The 21 remaining items tapped a variety of instances of physical, sexual or emotional abuse. Participants were asked to provide the frequency of occurrence of each item on a four-point scale ranging from 1 (never) to 4 (more than twice). The revised version of the JVQ used in this study had a Cronbach's alpha of .84. Given that the original validation article reported a Cronbach's alpha of .85 (Finkelhor et al. 2005), the adaptation appears to be a reasonable proxy of the original measure.

Daily hassles were measured by the Inventory of High-School Students' Recent Life Experiences (IHSS-RLE; Kohn, & Milrose, 1993). This is a 41-item self-report scale used to measure daily hassles specific to high-school students such as "Being let down or disappointed by friends" and "Disagreements with boyfriend/girlfriend." Students were asked to indicate how often each experience had been a part of their lives in the past month on a four-point scale ranging from 1 (not at all) to 4 (very much). Kohn and Milrose (1993) reported a Cronbach's alpha coefficient of .91 for the IHSSRLE; in the current study the Cronbach's alpha was .93.

To remain consistent with past research on Nova Scotia youth (Nova Scotia Department of Health, 1995), depression was measured using the Center for Epidemiological Studies Depression Scale (CESD; Radloff, 1977), which is a 20-item self-report scale that assesses the presence of depressive symptoms in the past week. Items include statements such as "I was bothered by things that usually don't bother me" and are rated on a four-point Likert scale ranging from 0 (rarely) to 3 (most of the time). The Cronbach's alpha in the current study was .77, which is consistent with the Cronbach's alpha's reported in the initial validation study (α = .85; Radloff, 1977) and follow-up research using an adolescent sample (α = .83; Aebi, Metzke, & Steinhausen, 2009).

An adaptation of the Nova Scotia Student Drug Use Survey (Poulin, 2002) was used to assess patterns of marijuana, illicit drugs, prescription drugs, cigarettes and alcohol use. The original self-report survey contained 100 items aimed at adolescents in grades 7 to 12, and was designed to identify determinants of addiction-related health. Only those items measuring the presence

Table 1
Percentage of Students, by Gender, Reporting Drug Use over the Past 30 days

Drug Type	Males (%)	Females (%)
Cigarettes	17.0	23.1
Alcohol	64.3	60.3
Marijuana	39.3	23.1
Illicit drugs	6.2	6.3
Non-medical prescription	5.4	11.5

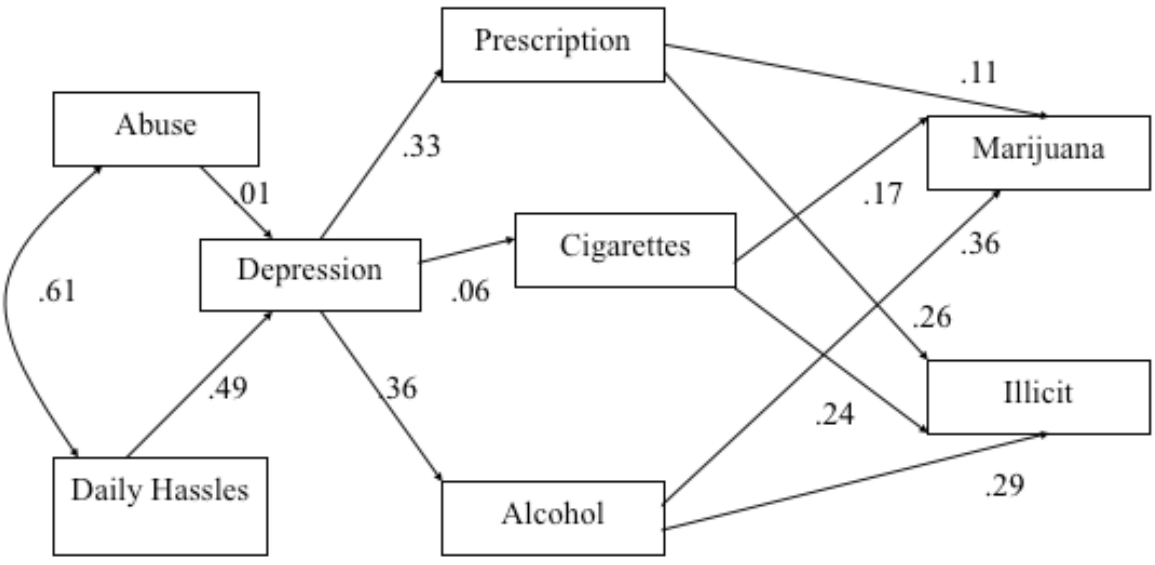
and frequency of substance use were included in the current study. Respondents were asked to indicate how often they had used each of the substance types on a 7-point scale ranging from 1 (not at all) to 7 (almost every day). Adolescents who reported using illicit or prescription drugs were asked to specify which drugs they had used.

Results

Table 1 shows the percentage of surveyed adolescents who reported any use of each of the drugs by gender. In this sample, the most frequently used drug was alcohol, followed by marijuana and cigarettes. The most frequently reported illicit drug used was ecstasy while the most commonly reported non-medical use of prescription drugs was of pain killers such as oxycodone ("Oxycontin") and acetaminophen/codeine ("Tylenol 3").

To test for gender differences, a Multivariate Analysis of Variance (MANOVA) was conducted. In line with other research that conducted a high number of analyses (e.g., McWilliams & Bailey, 2010), alpha was set at .01 for all analyses in an attempt to control for Type I error. The multivariate main effect was found

Figure 1. Path Coefficients for the Base Model



to be marginal, but non-significant, $F(5, 184) = 2.83$, $p = .017$, partial eta-squared = .071. Given that this result represents a marginal effect, the univariate tests were examined. Significant gender differences were observed only in the use of marijuana, Pillais = .101, $F(1,188) = 6.90$, $p < .01$, with males ($M = 2.33$, $SD = 2.12$) reporting more frequent use than females (M = 1.59, $SD = 1.35$). Although not statistically significant, Pillais = .101, $F(1,188) = .061$, $p = .804$, it is also worth noting that over twice as many females (11.5%, $M = 1.22$, $SD = .82$) as males (5.4%, $M = 1.19$, $SD = .84$) reported prescription drug use.

A second Multivariate Analysis of Variance (MANOVA) was conducted to assess the effect of gender on levels of depression (CESD), experience with physical, sexual, and emotional abuse (JVQ), and experience with daily hassles (IHSSRLE). Again, results indicated a marginal effect for gender at the multivariate level, with females scoring slightly higher than males, Pillais =.05, $F(3, 186) = 3.49$, $p = .017$. However, there were no significant effects at the univariate level: CESD, $F(1, 188) = 2.32$, $p = .13$; JVQ, $F(1, 188) = 1.95$, $p = .16$; IHSSRLE, $F(1, 188) = 1.60$, $p = .21$. Mean scores are presented in Table 2. Given the presence of only one marginal gender difference at the univariate level (i.e., marijuana use), the data was collapsed across gender to examine the relationships among abuse, daily hassles, depression, and substance use.

First, correlations were computed to determine the strength of the relationships among the variables. As shown in Table 3, significant correlations were found among all of the variables except cigarettes: no rela-

Table 2

Means and Standard Deviations by Gender, and Ranges of Scores on Measures of Depression, Daily Hassles and Abuse

	Males		Females			
	M	SD	M	SD	Obtained Range	Possible Range
Daily Hassles	71.66	17.2	75.17	21.0	41 – 145	41-164
Abuse	31.38	8.6	29.57	9.0	21 – 68	21 – 84
Depression	20.29	7.9	22.15	8.8	0 – 60	0 – 60

Note. M = Mean; *SD* = Standard Deviation

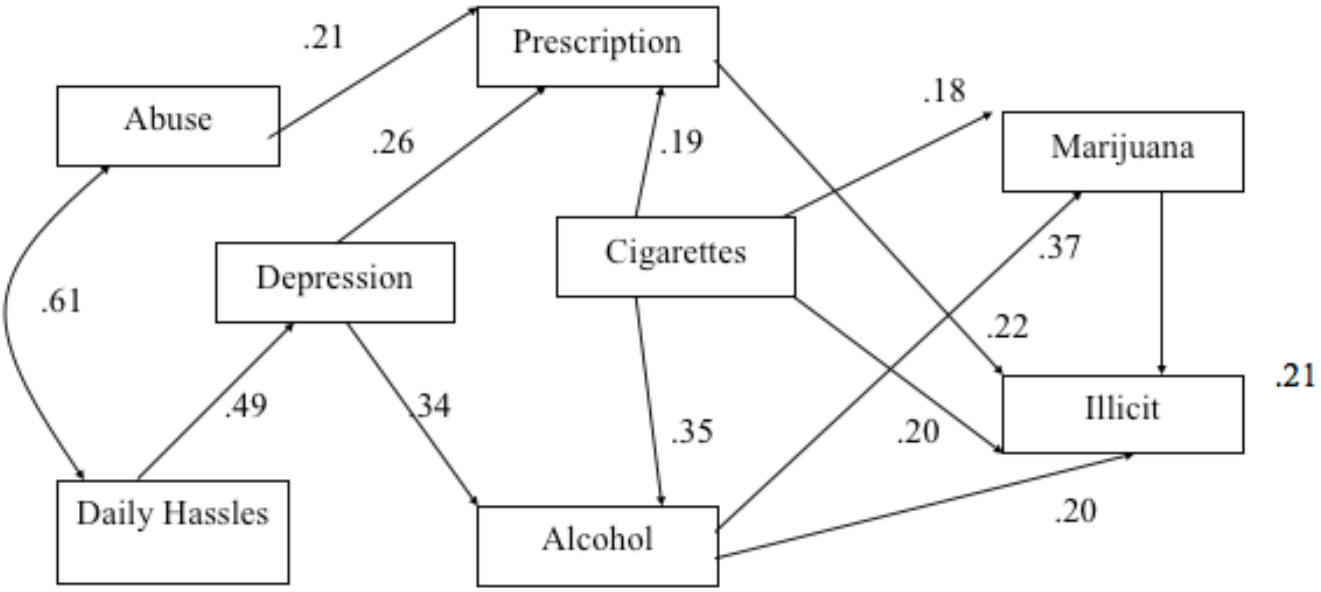
Table 3

Correlation Matrix

	Abuse	Hassles	Depress	Cigs	Alcohol	Marijuana	Illicit
Hassles	.61**						
Depress	.31**	.49**					
Cigs	.08	.08	.06				
Alcohol	.22**	.21**	.36**	.36**			
Marijuana	.16*	.22**	.22**	.31**	.44**		
Illicit	.24**	.21**	.21**	.38**	.43**	.41**	
Prescript	.30**	.33**	.33**	.22**	.27**	.24**	.37**

Note. Hassles = Daily Hassles; Depress = Depression; Cigs = Cigarettes; Illicit = Illicit Drug Use; Prescript = Prescription Drug Use.
* $p < .05$; ** $p < .01$; *** $p < .001$

Figure 2. Path Coefficients for the Final Model



tionship was found between cigarettes and any of the dependent variables. Path analysis was then used to explore the relationships between abuse, daily hassles, depression, and substance use by first examining the structure underlying the correlations, and then testing the goodness of fit between the hypothesized Base Model and the obtained correlations. A maximum likelihood estimation procedure was undertaken and modification indices in excess of 4 were requested using AMOS 4.0 (Arbuckle & Wothke, 1999). Figure 1 presents the results of the analysis showing standardized path coefficients.

Hypothesized Model

As indicated by the goodness of fit indices, the hypothesized model shows only a moderate degree of fit to the data. Furthermore, the value of chi-square is significant [$\chi 2$ (16) = 65.9, $p < .001$] and the value of Root Mean Square Error of Approximation (RMSEA = .13) indicates that there is a significant amount of variance in the correlation left unaccounted for by the model. While, the goodness of fit indices are all above .80, with the exception of the relative fit index (RFI = .69), the path coefficients indicate that three of the proposed paths generated non-significant critical ratios (CR < 2.0): abuse to depression, depression to cigarette use, and prescription to cannabis use. Overall, the relationships proposed in the Base Model are only partially supported. In addition, there is some evidence that additional paths could be added to improve the model. Thus, a secondary set of analyses were undertaken in an attempt to improve the model.

Revised Model

First, to improve the fit of the model, the three non-significant paths were removed. Then, inspection of the Modification Indices led to the consideration of new paths. The sequence of steps taken to revise the model and the effect on the various indices of fit are shown in Table 4. The Final Model (Figure 2) shows an excellent fit to the data as indicated by the Goodness of Fit Index (GFI = .911) and the non-significant chi-square test [$\chi 2$ (15) = 15.0, $p = .453$]. Consideration of the other fit indices also show that the model fits the data well (see Table 4). All proposed relationships in the revised model had significant path coefficients.

A strong correlation was obtained between daily hassles and abuse ($\beta = .61$, $t = 7.13$, $p < .001$). The path leading from daily hassles to depression was significant ($\beta = .49$, $t = 7.81$, $p < .001$). In examining the self-medication hypothesis, the paths from depression to alcohol use ($\beta = .34$, $t = 5.41$, $p < .001$) and prescription drug use ($\beta = .26$, $t = 3.74$, $p < .001$) were found to be significant. Abuse showed a significant path to prescription drug use ($\beta = .21$, $t = 3.01$, $p < .01$). In examining the gateway drug hypothesis (i.e., which "weak" substances significantly predicted the use of "hard" substances), cigarette use showed significant pathways to alcohol

Table 4
Fit Indices Resulting from Modifications to the Base Model

	Chi-Sq	df	*p*	GFI	AGFI	CFI	RFI	RMSEA
Base Model	65.9	16	<.001	.92	.81	.85	.69	.13
Remove 3 non-significant paths	69.1	19	<.001	.91	.82	.85	.73	.12
Add 4 new paths*:								
Cigarettes -> Alcohol	41.6	18	.001	.95	.89	.93	.83	.08
Cigarettes -> Prescription	33.1	17	.011	.96	.91	.95	.85	.07
Cannabis -> Illicit	23.8	16	.095	.97	.93	.98	.89	.05
Abuse <- Prescription	15.0	15	.453	.98	.95	1.0	.92	.00

*Paths were added on the basis of modification indices only if they were consistent with the self-medication and gateway drug hypotheses being tested. The final model produced no modification indices > 4.

use (β = .35, t = 5.45, p < .001), marijuana use (β = .18, t = 2.60, p < .01), prescription drug use (β = .19, t = 2.84, p < .01) and illicit drug use (β = .20, t = 3.01, p < .01). Paths from alcohol use to marijuana use (β = .37, t = 5.36, p < .001) and illicit drug use (β = .20, t = 2.94, p < .01) were also significant. Further, there were significant paths from marijuana use (β = .21, t = 3.12, p < .01) and prescription drug use (β = .22, t = 3.61, p < .01) to illicit drug use. Finally, prescription drug use was found to be significantly related to illicit drug use (β = .22, t = 3.61, p < .001).

Discussion

The current study provides support for the hypothesis that both experience of abuse and daily hassles are related to the use of substances. Furthermore, the path analysis demonstrated that daily hassles are more strongly related to adolescent maladjustment than the experience of abuse. That is, the experience of daily hassles was related to the use of alcohol and prescription drugs whereas the experience of abuse was related to only prescription drugs. There was also partial support for the mediating role of depression. Depression scores were seen to mediate the relationship between daily hassles and the use of alcohol and prescription drugs. Prior to examining the implications of these links, actual patterns of drug use, depression and experience with stress will be discussed.

Consistent with previous research (e.g., Haans & Hotton, 2004), alcohol was the drug of choice among the sample: almost two-thirds of the students reported having consumed alcohol. Approximately one-third reported marijuana use over the previous month. There were no gender differences in the reported use of drugs other than marijuana (i.e., males reported significantly more use of marijuana than females), which is consistent with gender differences found in past research of adolescents (e.g., Peters, Copeland & Dillon, 1999; Spooner, 1999). Few students reported the use of illicit drugs (those who did commented that they used ecstasy).

With the exception of alcohol and illicit drugs, the rates of drug use obtained in this study are consistent with provincial prevalence rates obtained in the past decade (Poulin, 2002). Compared to Poulin's (2002) data, reported alcohol use in this study was higher (62.3%) than previously reported (51.7%), and reported use of illicit drugs was lower (6.2% vs. 12%). There are a number of possible explanations for these find-

ings. First, it may be that alcohol remains readily available and easily accessible to adolescents while illicit substances are becoming more strictly controlled. The province has seen the introduction of a community partnership and numerous monitoring programs that have contributed to a steady decrease in the availability of many ingredients (e.g., pseudophedrine) integral to the production of these substances (Community Partnership on Drug Abuse, 2006). A second possibility is that the increasing negative media attention paid to adolescent drug-related death in recent years (Covell, 2004) has lessened the appeal of hard substances, whereas there is no evidence that alcohol use has received similar negative attention. A third possibility, more related to the study's hypotheses, is that the reported rates of alcohol use were in direct response to the high rates of depression that were measured in the sample (i.e., alcohol may serve to self-medicate depression symptoms).

Eighty percent of the students in this research scored at or above the CES-D cut-off representing an increased risk of developing depression, which is particularly alarming and significantly higher than results found in past studies with similar samples. For example, a study completed with a similar demographic sample reported CES-D depression rates of 15% (Nova Scotia Department of Health, 1995), while another survey of adolescents reported a mean score of 13.13 and 16.79 among males and females, respectively (Chen, Johnston, Sheeber, & Leve, 2009). However, the season during which data was collected could have contributed to this finding. The study was conducted during late winter, when depression levels tend to spike (Rohan, Sigmon & Dorhofer, 2003), and shortly after a period of high stress for the participants (i.e., the students had recently completed an examination period). However, it is also possible that the numbers are reflective of a real situation. Previous research in the area has indicated above average rates of depression (Covell, 2004; O'Leary & Covell, 2002). The area is in a state of economic decline and transition from traditional industries. The rate of unemployment is high, buildings and roads are often in disrepair, and media reports perpetuate a bleak outlook for the future (Covell, 2004). For teens contemplating their post-high school careers, these factors may negatively impact their perceived long-term prospects. In focus groups held with adolescents in an earlier study, typical explanations of substance usage included attempts to decrease boredom and escape the "horrible reality of life." Other students commented on the need for professionals to help teens with depression rather than focus on drug use exclusively (Covell, 2004).

The students' observations that counselors would do well to address depression as a potential antecedent of drug use are consistent with the current findings. The path analysis revealed a significant link between daily hassles, depression, and the use of alcohol and prescription drugs. If daily hassles appear to be inevitable due to low SES and the decline of a community, perhaps it is not surprising to see them being strongly related with increased levels of depression among young adults. Consistent with the self-medication hypothesis, higher rates of depression in this sample are predictive of the use of alcohol and the non-medical use of prescription drugs. Furthermore, abuse was a direct predictor of prescription drug use. Whereas depression mediated the relationship between daily hassles and alcohol and drugs, there was no evidence of a mediating role for depression in the pathway between abuse and prescription drug use. One explanation for this is that trauma leads to symptoms better characterized by post-traumatic stress disorder (e.g., intrusive recollection and hypervigilance) which may be best medicated by stronger substances. The absence of significant pathways between abuse and both alcohol and cigarette use supports the notion that stronger medicine is perceived by adolescents to be better for coping with serious problems.

The high rate of depression obtained in this study, and its relation to gateway drug usage, clearly needs further study. Whereas the relationships found among the variables are intuitive, four potential limitations should be noted. First, the process used to modify the model exposes the study to capitalization on chance (MacCallum, Roznowski & Necowitz, 1992). Second, the study used a cross-sectional design whereas a longitudinal study would be preferable. Third, the study used a convenience sample in which two classes were chosen from four high schools in Nova Scotia. Due to this method of sampling, one must be careful in generalizing these findings. Finally, the nature of data collection (i.e., collection during class time) precluded the inclusion of multiple measures. Thus, the mediating role of various anxiety disorders, including PTSD, could not be explored. The consideration of other me-

diating variables and a replication of the model with a new sample and a longitudinal design are advisable.

If replicated, multi-domain and coordinated strategies to systematically identify and address community-related predictors of adolescent depression and drug use will be necessary (Becker, 1997; Farrer, 2003; Pentz, 2000). More specifically, replicated findings would further illustrate the need for drug-education programs to also address stress and depression as a means of reaching those students who self-medicate with drugs (i.e., a number of participants in this study seem to be using alcohol and prescription drugs to cope with negative affect). This also supports the writing of Butters (2005) who suggested that the effectiveness of current drug education programs suffer because of the lack of focus on self-medicating youth. As so eloquently stated by D'Emidio-Caston and Brown (1998), "For prevention programs to be effective, they must support those most at risk to be able to see a future when they close their eyes" (p. 115).

The pattern of relations revealed in the path analysis maintains the self-medication hypothesis for the use of alcohol and the non-medical use of prescription drugs. In turn, these substances appear to be gateways for the use of illicit drugs. This study found that cigarettes appear to play an interesting role as a gateway drug, given the finding that the use of cigarettes predicts the use of alcohol, marijuana, prescription drugs and illicit drugs. It seems plausible that this finding reflects a changed culture with regard to smoking. Since 2002, smoking in public places has been illegal in the area (Department of Health, 2002). As a result, smoking may have become an expression of an anti-social identity in adolescence. In the current model, abuse, daily hassles, and depression were not predictive of cigarette use, suggesting that cigarettes do not serve a self-medicating function. Further research is needed to examine current attitudes toward cigarette use as well as the links among cigarette and other substance use. The present data also provide partial support for the gateway drug hypothesis as the use of alcohol and cigarettes were both significantly related to the use of marijuana, which was in turn significantly related to the use of other illicit drugs.

Overall, the data suggest the need for drug education programs to include a strong focus on healthy and more efficacious ways of coping with stress. Since these findings provide support for the self-medication hypothesis within drug-using youth, it stands to reason that drug education programs must move away from an exclusive emphasis on socially normative drug use. It would be most helpful if teachers were trained to provide such education so that they could also act as a first line of defense by recognizing the signs of depression among adolescents. In turn, at-risk adolescents may be identified early and referred to the appropriate resources, such as guidance counselors, school psychologists, or other mental health professionals. The data therefore underscore the need for more attention to be paid to the mental health of adolescents, and for more mental health services in schools. Whereas on-site clinics have been demonstrated to be very effective in assisting adolescents with daily hassles and addictions, these findings suggest that numerous students are overlooked and are turning to substances to cope (e.g., Harris & Hoover, 2003). In conclusion, helping students improve their problem-solving and coping skills should decrease levels of stress and depression, thereby lessening the appeal of substances as medication and potentially increasing the effectiveness of drug education programs.

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