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Victimization Experiences and Adolescent Substance Use: Does the Type and Degree of Victimization Matter?

Gillian M. Pichevsky
University of Nevada, Las Vegas

Abigail A. Fagan
Florida State University

Emily M. Wright
University of Nebraska at Omaha, emwright@unomaha.edu

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Gillian M. Pinchevsky*
Department of Criminology and Criminal Justice
University of South Carolina
1305 Greene Street
Columbia, SC 29208
gillianp@mailbox.sc.edu
(803)777-3075

Abigail A. Fagan
College of Criminology & Criminal Justice
Florida State University
Hecht House, 634 W. Call Street
Tallahassee, FL 32306
afagan@fsu.edu
(850) 645-0375

Emily M. Wright
School of Criminology & Criminal Justice
University of Nebraska – Omaha
6001 Dodge Street, 218 CPACS
Omaha, NE 68182
emwright@unomaha.edu
(402) 554-3898

*Corresponding author

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Biographical Statements

Gillian M. Pinchevsky is a Doctoral Candidate in the Department of Criminology and Criminal Justice at the University of South Carolina. Her research interests include victimization, intimate partner violence, and the criminal justice response to violence and victimization.

Abigail A. Fagan is an Associate Professor in the College of Criminology and Criminal Justice at Florida State University. Her research focuses on the etiology and prevention of juvenile delinquency and substance use, with an emphasis on examining the ways in which scientific advances can be successfully translated into effective crime and delinquency prevention practices. Her research includes particular attention to the effects of family processes (e.g., parenting practices and sibling relationships), victimization experiences, and community influences on juvenile offending.

Emily M. Wright is an Assistant Professor in the School of Criminology and Criminal Justice at the University of Nebraska at Omaha. Her research examines intimate partner violence and exposure to violence in neighborhood context. Her research has appeared in journals such as *Social Problems*, *Justice Quarterly*, and *Child Abuse and Neglect.*

Abstract

Evidence indicates an association between victimization and adolescent substance use, but the exact nature of this relationship remains unclear. Some research focuses solely on the consequences of experiencing indirect victimization (e.g., witnessing violence), others examine direct victimization (e.g., being personally victimized), and still others combine both forms of victimization without assessing the relative impact of each on substance use. Further, many of these studies only assess these relationships in the short-term using cross-sectional data. This study uses data from the Project on Human Development in Chicago Neighborhoods (PHDCN) to explore the impact of experiencing *only* indirect victimization, *only* direct victimization, *both* forms of victimization, and *no* victimization on substance use at two time points during adolescence. We find that of those adolescents who are victimized, the majority experience indirect victimization only, followed by experiencing both forms of victimization, and experiencing direct victimization only. Each of the victimization experiences were associated with increased contemporaneous substance use, with the strongest effects for those experiencing multiple forms of violence. For all victims, however, the impact on substance use declined over time.

Key terms. Victimization, substance use, adolescents, community violence

The exposure of children and adolescents to community violence has been identified as a "national crisis" which must be better understood and more effectively addressed (The United States Department of Justice, 2012). Children experience high rates of violent victimization, with national studies estimating that over 60 percent of youth are exposed to violence annually (Finkelhor, Ormrod, & Turner, 2009; Finkelhor, Turner, Ormond, Hamby, & Kracke, 2009). Teenagers are especially likely to be victims of violent crimes, and their chances of experiencing and witnessing violence in their communities is particularly high (Finkelhor, Turner, Ormrod, & Hamby, 2009). The consequences of such exposure include short- and long-term negative effects on academic performance, mental health, aggressive and violent behaviors, and substance use (Cusworth Walker, Maxson, & Maxfield, 2007; Finkelhor, Ormond, & Turner, 2009; Jonson-Reid, 1998; Lynch, 2003; Macmillan, 2001; Schwab-Stone et al., 1995).

Adolescent substance use is also a public health concern. A 2011 national survey found that approximately 19 percent of 12th grade students reported smoking cigarettes in the last month, 40 percent reported drinking alcohol in the last month, and 36 percent used marijuana in the past year (Johnston, O'Malley, Bachman, & Schulenberg, 2012). Substance use has been associated with increased aggression, violence, problems in school, drug dependence, and health problems, in adolescence and beyond (e.g., Dukarm, Byrd, Auinger, & Weitzman, 1996; Hingson, Heeren, & Winter, 2006; Lynskey & Hall, 2000; Mrug & Windle, 2009; Valois & Mckeown, 1995).

Although there is some evidence that both indirect (e.g., witnessing violence or hearing about violence happening to others) and direct (e.g., personally experiencing violence) exposure to violence in the community increase substance use (Fagan, 2003; Kilpatrick et al., 2000; Schwab-Stone et al., 1995; Sullivan, Kung, & Farrell, 2004; Turanovic & Pratt, 2012), such research is relatively scant. Most research examining the detrimental effects of victimization has focused on

mental health problems and/or violent behaviors, and far fewer studies have examined its impact on adolescent substance use (Buka, Stichick, Birdthistle, & Earls, 2001; Sullivan et al., 2004). The current paper seeks to fill this gap by assessing the effects of exposure to violence in the community[1] on tobacco, alcohol, and marijuana (TAM) use. Specifically, we assess the relative effects of different victimization experiences (experiencing *only* indirect victimization, *only* direct victimization, *both* victimization experiences, and *no* victimization) on adolescent TAM use at two time points.

The Victimization/Substance Use Relationship

Scholars have noted a consistent and robust relationship between victimization and offending during adolescence (Fagan & Mazerolle, 2011; Jennings, Piquero, & Reingle, 2012; Sampson & Lauritsen, 1990), with various explanations put forth to account for this association. Our study is guided by General Strain Theory (GST), which posits that stressful experiences, particularly victimization, are likely to foster the development of antisocial behaviors (Agnew, 2006). Violent encounters may result not only in physical pain or injury, but also intense negative emotions such as anger, fear and anxiety. These stressful experiences and emotions place victims at an increased risk for engaging in delinquency. According to GST, victims may engage in deviant and/or criminal coping strategies intended to alleviate or reduce the strain and/or the emotions stemming from it.

While victims may respond to victimization with aggression and violence (e.g., fighting back against those who assaulted them), GST would also predict increased drug use among victims. Victims may resort to drinking, smoking, or using other drugs in order to counteract the stress of

[1] Compared to the literature pertaining to exposure to violence in the home (e.g., intimate partner violence or child abuse), far less research has focused on exposure to community violence. This paper and the following review of the literature therefore concentrates on the consequences of indirect and direct victimization experienced in the community, not the home.

being victimized, witnessing victimization, or anticipating future violent experiences (Agnew, 2002; Kaufman, 2009; Taylor & Kliewer, 2006). Taylor and Kliewer (2006) term this type of reaction "avoidant coping," whereby victims may use drugs to relieve the negative emotions produced by the traumatic event(s), particularly when other responses, such as attacking the source of stress directly, are not available. Victimization could also affect one's emotional regulation and impair self-restraint, which in turn can increase the likelihood of drug use (Sullivan, Farrell, Kliewer, Vulin-Reynolds, & Valois, 2007).

Although the majority of studies guided by GST have examined the effects of victimization on outcomes other than substance use, there is evidence of a significant association between exposure to violence in the community and increased alcohol and/or other drug use by teenagers (Browning & Erickson, 2009; Kilpatrick et al., 2003; Kliewer & Murrelle, 2007; Kliewer et al., 2006; Taylor & Kliewer, 2006; Zinzow et al., 2009). Much of this research has been based on cross-sectional data, however, which is problematic given evidence of bi-directional relationships between the two constructs (Mrug & Windle, 2009; Ousey, Wilcox, & Fisher, 2011). Nonetheless, some longitudinal studies have demonstrated that exposure to violence outside of the home increases alcohol and other drug use among adolescents (Fagan, 2003; Farrell & Sullivan, 2004; Kaufman, 2009; Sullivan et al., 2004; Turanovic & Pratt, 2012). Our study seeks to build upon this research by examining both the immediate impact of exposure to violence on substance use, and the degree to which this relationship persists 2.5 years later.

What types of victimization matter most?

We also seek to generate new insights into the victimization/substance use relationship by exploring whether or not different types of victimization have unique effects on adolescent substance use. While GST (Agnew, 2006) considers both direct and indirect (or "vicarious")

forms of victimization to be significant stressors that can result in deviant coping mechanisms, Agnew has hypothesized that direct victimization may be more detrimental, as it can have physical and emotional consequences, is more proximal to the individual, may be more likely to be seen as unjust, and may be perceived to be of greater magnitude compared to indirect victimization. However, GST also acknowledges that indirect victimization can result in negative adaptations, especially if such events occur routinely and/or to significant others. In fact, some research suggests that, compared to direct victimization, indirect victimization is more frequently experienced by adolescents, and correspondingly, may be more likely to be anticipated in the future (Gorman-Smith, Henry, & Tolan, 2004; Stein, Jaycox, Kataoka, Rhodes, & Vestal, 2003). The National Survey of Children's Exposure to Violence (NatSCEV), for example, found that among youth aged 14-17, 42 percent had witnessed an assault in their community, whereas 27 percent had been directly victimized by a physical assault (Finkelhor, Turner, Ormrod, et al., 2009).

The operationalization of victimization has not been consistent throughout the extant research. Some studies have solely examined indirect victimization (Kliewer & Murrelle, 2007; Kliewer et al., 2006), others have focused only on direct victimization (Brady, Tschann, Pasch, Flores, & Ozer, 2009; Simantov, Schoen, & Klein, 2000), and some have combined both indirect and direct victimization into a single measure of victimization (Buka et al., 2001; Thompson, Sims, Kingree, & Windle, 2008). The few studies that have examined both forms of victimization typically assess the impact of each independently (Albus, Weist, & Perez-Smith, 2004; Berenson, Wiemann, & McCombs, 2001; O'Donnell, Schwab-Stone, & Muyeed, 2002; Taylor & Kliewer, 2006; Vermeiren, Schwab-Stone, Deboutte, Leckman, & Ruchkin, 2003) and have rarely assessed the unique or relative effects of each of these different victimization

experiences (but see Acosta, Albus, Reynolds, Spriggs, & Weist, 2001; Fowler, Tompsett, Braciszewski, Jacques-Tiura, & Baltes, 2009; Sullivan et al., 2007). Despite Agnew's (2002) suggestion that different victimization experiences should be controlled for simultaneously in statistical analyses in order to prevent overestimating the effects of one form of victimization, empirical studies have largely failed to do so.

Available evidence on the effects of different victimization experiences is scant, and the results to date have been mixed (Aisenberg & Herrenkohl, 2008). Some studies have shown that witnessing violence, but not directly experiencing it, is linked to increased alcohol and other drug use (Albus et al., 2004), while others have found that direct but not indirect victimization is related to alcohol use (Taylor & Kliewer, 2006), and still others have reported that both forms of victimization are related to increased alcohol and other drug use (Berenson et al., 2001; Vermeiren et al., 2003; Zinzow et al., 2009). More empirical research, especially that which relies on longitudinal data, is needed to help clarify what types of victimization are most likely to result in substance use.

GST posits that the cumulative effect of experiencing multiple forms of victimization is most detrimental, particularly if these experiences occur within a relatively short period of time (Agnew, 1992). That is, individuals may be able to effectively cope with one or two stressful experiences, but the accumulation of strain is more difficult to overcome. Research indicates that adolescents are at risk for experiencing repeat or *multiple* victimizations (Finkelhor, Ormond, Turner, & Hamby, 2005; Saunders, 2003). For example, one national study showed that 71 percent of the sample of children and youth had experienced at least one type of victimization in the past year, and of those children, 69 percent had experienced more than one type of victimization (Finkelhor, Ormond, & Turner, 2007). Repeat victimization may be particularly

detrimental for adolescents, given that they are developmentally less skilled at effectively coping with stress (Agnew, 2006). Moreover, empirical research has shown that polyvictimization and the cumulative effects of exposure to violence can lead to mental health problems and maladjustment among adolescents (e.g., Finkelhor et al., 2007; Finkelhor, Ormrod, et al., 2009; Finkelhor, Turner, Ormond, et al., 2009; Margolin, Vickerman, Oliver, & Gordis, 2010).

Given the scarcity of data, and the fact that some prior work has been based on cross-sectional data, there is a clear need for further investigation of how different victimization experiences affect future drug use. In order to increase our understanding of the relationship between victimization and substance use, we examine the effects of experiencing *only* indirect victimization, *only* direct victimization, *both* types of victimization, and *no* victimization on tobacco, alcohol, and marijuana use during adolescence. Further, we investigate these relationships at two points in time, using prospective data from an ethnically diverse sample of youth spanning the full range of adolescence.

Methods

Sample

This study utilized data from the Project on Human Development in Chicago Neighborhoods (PHDCN), a longitudinal project designed to examine pro-social and antisocial behavioral adaptations of children and adolescents (Earls, Brooks-Gunn, Raudenbush, & Sampson, 2002). To sample respondents from the entire city of Chicago, the PHDCN research staff first identified 343 neighborhood clusters (NCs), derived from all 847 census tracts in Chicago. These NCs were then stratified by seven categories of racial/ethnic and socio-economic diversity. Eighty neighborhoods were subsequently selected via stratified probability sampling, and participants within these NCs were asked to participate in the Longitudinal Cohort Study (LCS). Only

households with families with at least one child in one of seven age cohorts (ages 0, 3, 6, 9, 12, 15, and 18) were eligible for inclusion. The final sample included 6,228 participants from the seven cohorts (75 percent of the eligible population) who participated along with their primary caregivers in in-home interviews (Earls et al., 2002). Given our focus on adolescent victimization and substance use, the current study relies on data collected from three cohorts of youth (those in Cohorts 9, 12, and 15 at wave one, and who were approximately 14 years old at wave two). The final analysis sample included 1,696 youth and their caregivers at wave two and 1,377 at wave three[2] from 79 Chicago neighborhoods.[3]

Measures

Dependent variable. Analyses focus on past month tobacco, alcohol, marijuana use (TAM) use, reported by youth on items derived from the National Household Survey on Drug Abuse (1991) and measured separately at waves two and three. Both dependent variables are based on a count of the number of substances (tobacco, alcohol, or marijuana) the respondent reported using in the past month, ranging from zero to three. Assessing *wave two TAM use* allowed us to examine whether victimization was associated with contemporaneous substance use, while predicting *wave three TAM use* allowed for the examination of effects over time.

Independent variables. At wave two, adolescents reported whether or not they were subject to a range of victimization experiences in the past year. A respondent was considered to have experienced any indirect victimization if he/she saw someone: chased, attacked with a weapon,

[2] 208 cases at wave two and 249 cases at wave three were excluded due to list-wise deletion of missing variables in the multivariate models. In checking the representativeness of our final samples compared to our target samples (n=1904 at wave two; n = 1626 at wave three), we found no significant differences for any of the variables included in these analyses.

[3] One of the 80 neighborhood clusters dropped out once analyses were restricted to adolescents in Cohorts 9, 12, and 15.

shot, shot at, threatened at least once in the past year, or hit two or more times[4] in the past year.[5] Comparable items were used to create a measure of experiencing any direct victimization with respondents reporting if they had personally experienced any of the same events in the past year. Four dummy variables were created from these measures to reflect four distinct and mutually exclusive types of victimization: *only indirect victimization*, *only direct victimization, both victimization types*, and *no victimization*. Individuals who were not victimized served as the reference category for the other three victimization experiences.

Control variables. To avoid misspecifying the relationship between victimization and substance use, multiple control variables were included in the analyses to account for other possible predictors of adolescent substance use (Hawkins, Catalano, & Miller, 1992). Adolescent self-reports at wave one were used to assess age, gender, and race/ethnicity. *Age* was measured as the youth's age in years. *Male* was a dichotomous variable that reflects the youth's gender. Race/ethnicity was measured by three dichotomous variables, *Hispanic*, *African American*, and *Other race*. Caucasians (non-Hispanic Whites) served as the reference category. *Household salary*, a caregiver-reported measure from waves one and two, indicated the total household income earned in the past year, and was based on an 11-point scale (1=less than $5,000; 11=more than $90,000).

We also accounted for other family, peer, and individual risk factors. Prior research has found that higher levels of parental monitoring may impact adolescent substance use and/or condition the relationship between exposure to violence and substance use (e.g., Chassin, Pillow,

[4] Over half of the sample (54 percent) had seen someone hit at least once in the past year, and including this item with the other five types of victimization increased the overall prevalence of any indirect victimization to 67 percent. In order to focus on somewhat less normative experiences, we restricted the measure to those who had seen someone hit two or more times in the past year. All other items in both the indirect and direct victimization measures were based on having been victimized one or more times.

[5] Given our focus on exposure to community violence, we did not include measures of victimization experienced within the home setting (e.g., child maltreatment or exposure to intimate partner violence) in these analyses.

Curran, Molina, & Barrera, 1993; Kliewer et al., 2006; Kosterman, Hawkins, Guo, Catalano, & Abbott, 2000; Sullivan et al., 2004). To control for the possible relationship between parental practices and adolescent substance use, we included a measure of *parent monitoring*, measured at wave two. This variable was the sum of three dichotomous items asking caregivers if they set rules regarding children's whereabouts on weekday and weekend nights; higher scores indicate greater parental monitoring. Because extant research has suggested that peer delinquency is one of the strongest predictors of adolescent substance use (Elliott, Huizinga, & Ageton, 1985; Windle et al., 2009), we controlled for *peer substance use*, which was measured at wave two and based on adolescent reports of the number of their friends who used marijuana, alcohol, and tobacco in the past year. Based on a four-point scale (1=none of them; 4=all of them), these items were standardized and summed (alpha=.85), with higher scores reflecting greater peer substance use.

Perceptions regarding the availability and harmfulness of drugs are also predictors of adolescent substance use (Beyers, Toumbourou, Catalano, Arthur, & Hawkins, 2004; Cleveland, Feinberg, Bontempo, & Greenberg, 2008; Gibbons et al., 2004). At wave two, children's *perceived substance use harm* was assessed using seven items (alpha=.75) from the National Household Survey on Drug Abuse (1991). Using a four-point Likert scale, youth reported "how much people would hurt themselves" if they used varying amounts of tobacco, alcohol and marijuana. Items from these seven items were standardized and summed, with greater scores representing more perceived harm. *Perceived availability of substances* represents respondents' wave two perceptions of how easily they could obtain cigarettes, alcohol, and marijuana (alpha=.87) using a four-point scale (1=probably impossible; 4=very easy). Finally, since prior behaviors are strong predictors of future behaviors, and because the early initiation of substance

use may be associated with future problematic behaviors (Hawkins et al., 1992; Windle et al., 2009), we included two dichotomous measures of past year substance use in our analyses: *Wave one TAM use* (included only in analyses predicting past month TAM use at wave two) and *wave two TAM use* (included only in analyses predicting past month TAM use at wave three) reflect whether or not the respondent reported any use of tobacco, alcohol, or marijuana in the past year (at waves one and two, respectively).

Statistical Analyses

Hierarchical modeling techniques (Hierarchical Linear Modeling [HLM], see Raudenbush & Bryk, 2002) were used to control for potential neighborhood influences on youth outcomes given that youth were clustered in 79 neighborhoods. These models adjust for the correlated error that exists between individuals living within the same neighborhoods. All predictors were group-mean centered and fixed to remove between-neighborhood variation that could be related to adolescent substance use, as well as to aide in the interpretation of coefficients. Outcomes were analyzed using Poisson models that corrected for over-dispersion.

The analyses proceeded in a stepwise fashion. First, analysis of variance (ANOVA) and post-hoc Tukey's Multiple Comparison Tests were conducted to assess the relative effects of the victimization types, by comparing the mean levels of wave two and wave three TAM use across the four victimization types. Next, we estimated the unique impact of each victimization type on TAM use while controlling only for the other victimization types. Finally, we re-estimated those relationships in a multivariate model which included all control variables.

Results

As shown in Table 1, the sample was on average 14 years old at wave two, 50 percent male, and was ethnically diverse, with 49 percent of youth reporting their race/ethnicity as Hispanic, 33

percent as African-American, 14 percent as Caucasian (non-Hispanic White), and 4 percent as another race or ethnicity. Approximately 36 percent of the sample experienced *only* indirect victimization, 3 percent experienced *only* direct victimization, 26 percent experienced both indirect and direct victimization, and 35 percent of the sample had never been victimized (see Table 1).

At wave two, the mean of past month TAM use was .30. Approximately 82 percent of adolescents reported no past month TAM use at wave two, while 9 percent reported using one substance, 6 percent used two substances, and 3 percent used all three substances (results not shown).[6] At wave three, the mean TAM use was .54. Similar to wave two, the majority of adolescents did not use any substances at wave three (68 percent). Sixteen percent of youth reported using one substance, 10 percent reported using two of the three substances, and 6 percent reported using all three substances (results not shown).[7]

[Table 1 about here]

The results of the ANOVA analyses shown in Table 2 provide mean comparisons for wave two and wave three TAM use across the four victimization types. Youth who were not victimized had significantly lower TAM use at both waves compared to those youth who experienced indirect victimization only or who experienced both indirect and direct victimization. Those who experienced only indirect victimization and who experienced only direct victimization had lower wave two and wave three TAM use compared to those youth who experienced both forms of victimization. Across the two waves, youth who had never been

[6] At wave two, roughly 11 percent of the sample used cigarettes in the past month, 12 percent used alcohol, and 7 percent used marijuana (results not shown).
[7] At wave three, roughly 18 percent of the sample used cigarettes in the past month, 25 percent used alcohol, and 11 percent used marijuana (results not shown).

victimized reported the lowest TAM use, while those who had experienced both forms of victimization reported the most TAM use.

[Table 2 about here]

The multivariate models predicting the unique impact of each victimization type on wave two and wave three TAM use are reported in Table 3.[8] Compared to adolescents who did not experience any victimization, those who experienced indirect victimization only, direct victimization only, and both victimization types reported significantly more wave two past month TAM use (Model 1). As relevant control variables were added to the model, the influence of all three victimization types declined, yet continued to exert independent, positive, and significant effects on TAM use (Model 2; Event rate ratio [ERR] for indirect victimization only = 1.60; ERR for direct victimization only = 2.33; and ERR for experiencing both types of victimization = 2.30, results not shown).

Models 3 and 4 assessed the effects of each victimization type on wave three TAM use (2.5 years later). When no control variables were included, experiencing only indirect victimization and experiencing both victimization types were each significantly related to future TAM use (Model 3). However, once demographic and other risk factors were added, the effects of each of the victimization types were rendered non-significant (Model 4).

In addition to the victimization effects, at both time points, older adolescents, youth with more substance using peers, those who perceived drugs to be more readily available, and youth

[8] The main focus of this study was to assess the overall impact of *any* victimization experiences, but it is also informative to understand the extent to which the *number of* victimization experiences impacts adolescent substance use. To explore the second issue, analyses were conducted using victimization measures that represented the number (count) of experiences each respondent reported for each victimization type (i.e., direct victimization, indirect victimization and both types) on wave two and wave three TAM use. The results were not substantially different from those reported here (which were based on the dichotomous variables). In addition, analyses including two measures of negative emotions (anger and depression) postulated by strain theory to impact substance use were conducted. These negative emotions did not significantly predict wave two or wave three TAM use, and did not substantially impact the effects of other measures included in the model. These variables were thus excluded from the final models presented here.

with prior TAM use reported more TAM use than youth who were younger, had fewer substance using peers, believed drugs were less available, and did not previously use any substances. Adolescents who perceived substances to be more harmful reported less TAM use than those who had more lax opinions on the harmfulness of substance use.

[Table 3 about here]

Discussion and Conclusion

This paper sought to extend previous victimization research and tests of GST by examining the effects of different types of exposure to community violence – indirect and direct victimization – on substance use, and the degree to which these types of victimization were associated with tobacco, alcohol, and marijuana use at two time points during adolescence: one closer in proximity to the victimization experiences and another 2.5 years later. Prior work has largely neglected to examine the impact of exposure to community violence on adolescent substance use or to analyze the unique effects of direct and indirect exposure to violence on substance use. We chose to focus on these relationships because adolescents are commonly exposed to community violence as witnesses or direct victims (Finkelhor, Ormrod, et al., 2009; Finkelhor, Turner, Ormond, et al., 2009; The United States Department of Justice, 2012), and they engage in alcohol and other drug use at relatively high rates (Johnston et al., 2012).

Overall, and consistent with some previous research, this study found that exposure to violence was significantly and positively associated with adolescent tobacco, alcohol, and marijuana use in the short term (e.g., Browning & Erickson, 2009; Kilpatrick et al., 2003; Kliewer & Murrelle, 2007; Kliewer et al., 2006; Zinzow et al., 2009). These results are also consistent with the predictions of GST, which posits that victimization is a stressful event

particularly likely to generate intense, negative emotions that must be alleviated, possibly through deviant coping strategies including substance use (Agnew, 2006).

The effect of victimization on substance use was not maintained 2.5 years later, however. While two of the victimization types (experiencing indirect victimization only and reporting both types of victimization) did predict increased TAM use at wave three, these relationships were not statistically significant when wave two TAM use and other control variables were added to the models. Many prior studies assessing the victimization/substance use relationship have relied on cross-sectional analyses and thus have not been able to assess longer-term effects of exposure to violence. A few studies have reported that victimization increases subsequent substance use over time (Fagan, 2003; Farrell & Sullivan, 2004; Kaufman, 2009; Sullivan et al., 2004; Turanovic & Pratt, 2012), though some have not (Kaufman, 2009; Thompson et al., 2008). General strain theory is somewhat unclear regarding the time frame within which stressful experiences are likely to have their greatest impact, but it does suggest that the impact of these experiences is especially detrimental in close proximity to its occurrence and dissipates over time (Agnew, 1992, 2001). Our results are supportive of this recency effect and suggest that victimization has a more immediate impact on increasing substance use, but as time lapses, other factors (e.g., peer influences or individual attitudes or opportunities) become more important in determining one's use of tobacco, alcohol, and marijuana. These findings also suggest that recency of victimization should be taken into account in empirical research (Agnew, 1992, 2001).

In addition to providing a prospective report of the victimization/substance use relationship, the current investigation contributed to the victimization literature by assessing whether different victimization experiences independently impacted substance use. While strain theory would argue that any form of victimization could lead to deviant coping strategies (Agnew, 2006), the

theory also posits that being a victim of direct victimization may have more serious negative effects. This type of victimization is thought to have greater physical and emotional consequences and is "closer" to the individual, which increases its magnitude in comparison to vicarious or indirect victimizations. Nonetheless, because indirect victimization is more commonly experienced than direct victimization, it might be just as consequential for adolescents, especially if they witness victimizations routinely or if these attacks happen to significant others (e.g., family, close friends). GST also suggests that the accumulation of several stressful events within a relatively short period of time is particularly harmful (Agnew, 1992).

The results of this study generally support these postulations. According to bivariate analyses, the average level of reported TAM use at both time points significantly differed according to the type of victimization experienced. Those who had not experienced any victimization had the lowest TAM use, followed by those who experienced direct victimization only and those who experienced indirect victimization only. Adolescents who experienced both types of victimization had the highest TAM use. These findings also support research indicating that polyvictimization leads to the most maladaptive outcomes for youth (e.g., Finkelhor et al., 2007; Finkelhor, Ormrod, et al., 2009; Finkelhor, Turner, Ormond, et al., 2009; Margolin et al., 2010). Nonetheless, in multivariate models, all three victimization types were significantly related to past month TAM use measured at wave two, suggesting that adolescents may use substances to counteract the stress and negative emotions produced by traumatic events of different types and all levels (Agnew, 2002; Kaufman, 2009; Taylor & Kliewer, 2006).

A somewhat unexpected finding in our study was that only a relatively small proportion of our sample (three percent) experienced direct victimization only. The majority of respondents who experienced direct victimization also experienced indirect victimization, although the

reverse was not true. While the results indicated that those experiencing only direct victimization were significantly more likely to report substance use compared to those not victimized (at wave two but not wave three), additional research is needed to further explore the unique impact of this form of violence on substance use. Given the limited research in this area, additional studies with even larger sample sizes may be needed to identify the characteristics of youth who only experience direct victimization, and to compare the impact of this form of violence with other types of violence exposure.

Given that exposure to violence, especially multiple exposures, did increase adolescent substance use in the short-term, the findings have relevance for policy and practice. Individuals working with youth in school and community agencies must be aware of the high rates of exposure to violence and TAM use among adolescents. Further, they should understand that substance use may be used as a coping mechanism to deal with the pains of victimization, especially among adolescents lacking pro-social coping skills. Youth who have disclosed experiencing any type of victimization should be targeted for counseling and other social support programs to counterbalance the negative impact of these victimizations. These services may be particularly needed in areas known to have higher rates of violence and victimization, such as urban, socially and economically disadvantaged neighborhoods (Sampson & Groves, 1989; Sampson & Raudenbush, 1999; Sampson, Raudenbush, & Earls, 1997). Because even young children are likely to be exposed to violence, and given the immediate negative consequences stemming from victimization, prevention measures that educate children about how to recognize and cope with negative emotions should be implemented as early as possible in the life course.

Although the current investigation has addressed a gap in the literature, there are some limitations to the study. First, data were collected in one city – Chicago – and one time-period –

the 1990s – which limits the generalizability of the results. In addition, the PHDCN was designed to study adolescents nested within neighborhoods. We did not examine neighborhood effects in this paper, but it is possible that neighborhood characteristics may influence these relationships and additional research should examine such effects. Despite these limitations, our study provides a foundation for examining the relative effects of different victimization experiences on substance use, and exploring whether these relationships persist over time.

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Table 1. Sample Means and Standard Deviations

	Mean	SD	Min-Max
Outcomes			
Count of past month TAM use, wave two	.30	.72	0-3
Count of past month TAM use, wave three	.54	.91	0-3
Exposure to Violence Variables			
Experienced indirect victimization only	.36	.48	0-1
Experienced direct victimization only	.03	.18	0-1
Experienced both victimization types	.26	.44	0-1
Experienced no victimization	.35	.48	0-1
Control Variables			
Age	13.95	2.44	9.11-19.89
Male	.50	.50	0-1
Hispanic	.49	.50	0-1
African American	.33	.47	0-1
Caucasian (reference)	.14	.35	0-1
Other race/ethnicity	.04	.19	0-1
Household salary	4.77	2.53	1-11
Parent monitoring	2.86	.46	0-3
Peer substance use	-.01	.99	-.86-2.99
Perceived substance use harm	.00	.99	-4.47-1.52
Perceived availability of substances	-.00	1.00	-1.35-1.60
Past year TAM use, wave one	.18	.38	0-1
Past year TAM use, wave two	.29	.45	0-1
N_1	1696		

Notes: TAM refers to tobacco, alcohol, and marijuana use

Table 2: Mean Comparisons for Victimization Types and Tobacco, Alcohol, and Marijuana (TAM) Use

	Wave Two, TAM Use	Wave Three, TAM Use
No victimization	.08 [b d]	.28 [b d]
Indirect victimization only	.31 [a d]	.58 [a d]
Direct victimization only	.26 [d]	.38 [d]
Both victimization types	.64 [a b c]	.88 [a b c]

Notes: Multiple comparisons made using Tukey's Multiple Comparison Test
[a] Significantly different from *no victimization*
[b] Significantly different from *indirect victimization only*
[c] Significantly different from *direct victimization only*
[d] Significantly different from *both victimization types*

Table 3. Fixed Effect Poisson Models Depicting the Influence of Degrees and Types of Victimization on Past Month Tobacco, Alcohol, and Marijuana (TAM) Use (Standard Errors in Parentheses)

	Past Month TAM Use, Wave Two		Past Month TAM Use, Wave Three	
	b (SE)	b (SE)	b (SE)	b (SE)
	Model 1	Model 2 [a]	Model 3	Model 4 [b]
Intercept	-1.47**	-2.12**	-.72**	-.99**
	(.08)	(.12)	(.05)	(.07)
Exposure to Violence Variables				
Indirect victimization only	1.45**	.47**	.78**	.09
	(.14)	(.15)	(.11)	(.11)
Direct victimization only	1.13**	.84**	.26	-.23
	(.35)	(.26)	(.39)	(.37)
Both victimization types	2.12**	.83**	1.13**	.20
	(.14)	(.16)	(.11)	(.11)
Control Variables				
Age	--	.17**	--	.14**
	--	(.03)	--	(.02)
Male	--	-.01	--	.29**
	--	(.10)	--	(.07)
Hispanic [c]	--	.25	--	-.14
	--	(.21)	--	(.16)
African American [c]	--	-.18	--	-.35
	--	(.20)	--	(.18)
Other race/ethnicity [c]	--	.04	--	-.41
	--	(.30)	--	(.22)
Household salary	--	-.01	--	.01
	--	(.02)	--	(.01)
Parent monitoring	--	.04	--	.02
	--	(.06)	--	(.05)
Peer substance use	--	.50**	--	.16**
	--	(.07)	--	(.04)
Perceived substance use harm	--	-.24**	--	-.16**
	--	(.04)	--	(.04)
Perceived availability of substances	--	.19**	--	.14**
	--	(.06)	--	(.05)
Wave one TAM use	--	.63**	--	--
	--	(.13)	--	--
Wave two TAM use	--	--	--	.58**
	--	--	--	(.11)
χ^2	159.67	269.01	117.72	138.92

Notes: Models correct for over-dispersion; all variables were fixed

[a] Analyses based on 1696 adolescents

[b] Analyses based on 1377 adolescents

[c] Reference category is "Caucasian"

** $p \leq .01$ * $p \leq .05$