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ADOLESCENT POLY-VICTIMIZATION AND ADULT SUBSTANCE USE: MODERATING ROLE OF SOCIAL SUPPORT (63 pp.)

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Poly-victimization refers to the experience of multiple victimizations of different kinds, such as bullying, sexual or physical assault, physically abusive punishment, and intimate partner violence, among others. Much attention has been given to the relationship between poly-victimization and adolescent outcomes, especially substance use, but little research attention has been given to the relationship between poly-victimization and *adult* substance use. This relationship, along with social support as a potential moderator, is important to explore for the sake of implementing non-punitive interventions and reducing our reliance on incarceration.

The present study examines the relationship between adolescent poly-victimization and subsequent substance use in adulthood, as well as the potential moderating effect of social support. Publicly available data from the National Longitudinal Study of Adolescent to Adult Health (Add Health) are used to assess the impact of multiple measures of violent victimization, as well as multiple measures of social support, such as religiosity and school and parental support, on adult substance use. Past-year marijuana and hard drug use are assessed as outcome variables. Findings suggest that adolescent poly-victimization is positively associated with the odds of using marijuana and hard drugs during adulthood, while higher levels of social support are negatively associated with the odds of using these substances during adulthood. Avenues for future research and policy implications are discussed.

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Introduction

Substance use is an issue most of us have encountered, whether it be personal use or struggles with abuse, the use and abuse by family members and friends, or political debates about the legalization of substances. In exploring the etiology of substance use, some researchers have considered the influence of poly-victimization. Poly-victimization refers to the experience of several *distinct* forms of victimization, such as physical, sexual, or emotional abuse, neglect, intimate partner violence, bullying, and assault (Ford & Delker, 2018). Consistent with Robert Agnew's (1992) general strain theory (GST), poly-victimization can be thought of as a strain that individuals cope with via drug use (Agnew, 1992; Ford et al., 2010).

According to the 2019 National Survey on Drug Use and Health (NSDUH), it is estimated that of people twelve years or older, 165 million used substances and 20 million met criteria for a substance use disorder. According to the Bureau of Justice Statistics and Uniform Crime Report, nearly 250,000 people were housed in federal and state correctional institutions for drug-related offenses in 2018 and over 1.5 million people were arrested in 2019 for drug-related offenses, most of which were for possession charges (Carson, 2020; Federal Bureau of Investigation, 2019). Importantly, the 250,000 people who were incarcerated in 2018 will eventually have to try to find employment, housing, and likely provide for a family while having a felony on their record. Many employers are hesitant to hire formerly incarcerated persons (Pager, 2003), forcing them to deal with the stressors associated with unemployment and poverty. It is estimated that 27.3% of formerly incarcerated persons who are of working age are unemployed, despite evidence indicating elevated levels of participation in the job market

compared to the general population (Couloute & Kopf, 2018). This can hinder the ability of formerly incarcerated persons to find stable housing, as it is commonplace for landlords to require paystubs as part of the application process. These stressors experienced by formerly incarcerated persons contribute to reduced levels of community cohesion and increased levels of crime and substance use (Drakulich et al., 2012). Additionally, the Bureau of Justice Statistics suggests that less than 30% of the 60% of incarcerated persons who met the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) criteria for drug dependence or abuse participated in a drug treatment program while incarcerated. This indicates that thousands of people with known substance use disorders go through the system without getting help, increasing their odds of future drug-related offenses.

Substance use and its collateral consequences (e.g., incarceration, employment difficulties, housing insecurity) garner much attention from sociologists and criminologists who continue to explore the etiology of adult substance use, the effect it has on families, the racialized nature of substance use laws, and the ways in which these laws have contributed to mass incarceration in the United States. One potential correlate of adult substance use that deserves more attention is adolescent poly-victimization. While poly-victimization has been shown to increase delinquent behavior and substance use in adolescence (Afifi et al., 2020; Davis et al., 2018; DuRant et al., 2000; Ford et al. 2010; Rapsey, Scott, & Patterson, 2019), the relationship between poly-victimization and adult substance use has not been as thoroughly explored. If an assessment of this relationship indicates that adolescent poly-victimization is a predictor of adult substance use, recommendations can be made for appropriate intervention. The justice system is not equipped to effectively treat people with histories of substance use, and it is necessary to continue identifying mechanisms that might reduce the association between victimization and

substance use. For instance, general strain theory suggests that strains are more likely to lead to maladaptive coping (e.g., delinquency, crime, substance abuse) when individuals lack legitimate prosocial coping mechanisms, like social support (Agnew, 2006). Literature suggests that increasing social support, which refers to the availability of family, friends, and/or teachers as a resource for coping with negative affect caused by strain, can serve as a buffer between negative emotions and maladaptive coping (Cohen & Syme, 1985; Gellert et al., 2018). Thus, social support may be an important moderator of the poly-victimization-substance use association. Scholars should explore the main effects adolescent poly-victimization on adult substance use as well as potential mechanisms that might mitigate this association to reduce the likelihood of maladaptive coping strategies.

The present study seeks to explore the relationship between adolescent poly-victimization and adult substance use. Furthermore, this study investigates how measures of social support moderate the influence of poly-victimization on substance use. In line with GST, it is expected that poly-victims will be more likely to report use of both legal and illegal substances. Finally, based on literature exploring the efficacy of social support to mitigate negative outcomes related to poly-victimization, it is expected that higher levels of social support will be negatively associated with substance use.

Literature Review

General Strain Theory

Strain theory was initially developed by Robert Merton (1938, 1968), who suggested the failure to attain economically motivated goals could result in deviant behavior. Merton suggests that when people are unable to achieve prosocial goals due to an inequitable social structure, they may resort to deviant behavior as a coping mechanism (Kubrin, Stucky, & Krohn, 2009). Strain theory has been elaborated several times since Merton's original work, most notably by Robert Agnew (1992). Agnew (1992, 2001, 2006) argues that three types of strain may lead to criminal coping—the failure to achieve positively valued goals, the introduction of negative stimuli, or the removal of positive stimuli from people's lives.

The failure to achieve positively valued goals is similar to Merton's emphasis on economic success, but Agnew broadens the scope of success. For instance, the failure to achieve positively valued goals can include the inability to obtain employment, failing to graduate high school or college, or unsuccessful attempts at dating. Additionally, Agnew provides several explanations about why failure to achieve positively valued goals may result in criminal coping. First is the conception that strain results from a *disparity between one's aspirations* and their *expected* achievements (Agnew, 1992). Traits like class, intelligence, personality, physical ability, and attractiveness influence individuals' capacity to achieve positively valued goals. People who believe they lack these traits are more likely to feel they cannot attain goals through legitimate means and are therefore more likely to resort to criminal coping (Agnew, 1992, p. 51).

The second conception of failure to achieve positively valued goals posits that when there is a *disparity between one's expectations* and their *actual* outcomes, negative emotions (i.e., disappointment, anger, resentment, unhappiness) classically associated with strain are more likely to arise. Expectations are theorized to come from past experiences or comparisons of oneself to similar others—when expectations are not met, individuals feel motivated to reduce the disparity between their expectations and *actual* outcomes through any means necessary, including deviance (Agnew, 1992, p. 52). The final conception of failure to achieve positively valued goals focuses on equity. Specifically, instead of preexisting expectations of outcomes, people evaluate exchanges based on the ratio of positive or negative outcomes to their positive or negative contributions (Agnew, 1992, p. 53). In other words, if individuals put forth effort that is comparable to others in an exchange, but are rewarded with less positive outcomes, they are more likely to view the exchange as unjust. Those who perceive outcomes as unjust are more likely to experience distress and might resort to deviance as a means of restoring equity (Agnew, 1992; Hegtvedt, 1990).

The second type of strain outlined by Agnew (1992), the introduction of negative stimuli, can refer to poor treatment by others, such as sexual or physical abuse, bullying by peers, mistreatment by administrators at work, or adverse experiences at school (Agnew, 2006). Importantly, this conception is inclusive of both *actual* and *anticipated* negative stimuli, meaning *expectations* of adverse experiences or poor treatment also serve as a form of strain (Agnew, 1992). In response to the actual or anticipated presentation of negative stimuli, individuals may engage in deviance as a means of escaping or alleviating the stimuli, exacting revenge against the source of the stimuli, or coping with the negative affect produced by negative stimuli (Agnew,

1992, p. 58). Coping with negative affect resulting from the presentation of negative stimuli is particularly relevant to substance use, the focus of the current study.

The final type of strain discussed in Angew's GST (1992) is the *actual or anticipated* removal of positive stimuli. Positive stimuli can be things valued by an individual, like a loved one dying or being incarcerated, having money stolen or property damaged, or the ending of a romantic relationship (Agnew, 2006). These *actual or anticipated* losses of positive stimuli can encourage deviant behavior as individuals attempt to prevent the loss, retrieve or substitute the lost stimuli, or cope with the resulting negative affect with substance use (Agnew, 1992). Failure to achieve positively valued goals, the presentation of negative stimuli, and the loss of positive stimuli can occur overlap or occur independently of one another.

When people encounter strain, they are likely to experience negative affective states, such as depression, anger, hopelessness, frustration, or sadness (Agnew, 1992, 1999, 2006, 2013). Criminal behavior, then, is often used as a form of corrective action or coping strategy to address negative affective states. For example, people might resort to theft or robbery to make up for the loss of money, they might resort to drug dealing, illegal sex work, or other illegitimate forms of money making to achieve economic success, or they might resort to substance use to mitigate negative emotions or temporarily forget about them (Agnew, 1992, 1999, 2006, 2013; Brezina, 2017; Kubrin, Stucky, & Krohn, 2009). Further, Agnew (2013) asserts that strain and the resulting emotions indirectly contribute to criminal coping by "fostering traits such as low constraint and negative self-control, reducing social control, and contributing to the social learning of crime," (p. 656). In other words, strain may reduce constraining influences on behavior, like self-control and social control mechanisms, which enhances the likelihood criminal or deviant behavior.

The extent of a strain's influence on behavior varies by the magnitude, recency, duration, and the clustered nature of adverse events. Magnitude refers to the amount of pain, physical or emotional, inflicted by the presentation of negative stimuli, the amount of loss associated with a loss of positive stimuli, or the distance between one's reality and their goals (Agnew, 1992, p. 65). The greater the magnitude (e.g., losing a parent vs. losing a distant relative), the more likely an individual is to cope with deviant behavior. Regarding recency, research has demonstrated a differential effect of strain based on the amount of time that has passed since the adverse events occurred (Agnew, 1992; Avison and Turner, 1988). Similarly, adverse events that take place over longer periods of time (duration) also increase the likelihood and variety of negative coping (Agnew, 1992; Folger, 1986; Pearlin et al., 1981). For example, we would expect deviant behavior from a 17-year-old to be more strongly associated with strain if they experienced abuse from age 12 to age 16, as opposed to experiencing abuse from age three to age four. Agnew (2006) refers to these strains that occur for longer durations as chronic strain. Clustering refers to the occurrence of negative events over a short period of time as opposed to events that are spread out over time (Agnew, 1992). Thoits (1982) argues that when many negative events occur closely in time, they are more likely to reduce the efficacy of existing coping mechanisms, increasing the likelihood of using deviance to cope.

However, strain, whether recent, chronic, or clustered, does not *always* result in criminal coping. Several factors influence whether individuals will choose nondelinquent or delinquent coping mechanisms, including the presence of alternative goals or values when current goals or values are blocked by strain, individual coping resources (intelligence, temperament, self-efficacy, etc.), the attribution of strain to others as opposed to oneself, positive or negative reinforcement of past deviance, and conventional social support (Agnew, 1992, p. 71-73). Within

social support, individuals receive informational, instrumental, and emotional support, enabling those who are experiencing strain to cope in nondelinquent ways. Social support will be discussed in further detail following a discussion of poly-victimization and substance use.

Following Agnew's GST, the present study examines poly-victimization as a form of strain. Poly-victimization falls within the parameters of Agnew's definition of negative stimuli, as it involves the presentation of negative stimuli (being jumped, threatened with a weapon, sexually or physically abused, etc.) that are expected to result in a negative affective state, particularly when these victimizations are recent, clustered, chronic, and inflict a high level of emotional or physical pain. This study examines substance use as an antisocial coping mechanism to cope with negative affective states. The term antisocial is used instead of criminal, as this study is not limited to the exploration of illicit substance use and includes cigarette and alcohol use, which are not illegal for adults. However, coping with strain via cigarettes and alcohol may not be the most prosocial way to cope with strain. Finally, this study examines social support as a potential moderator of the association between poly-victimization and substance use. The presence of more forms of social support, such as closeness to parents, feelings of belonging at school, and participation in prosocial activities with prosocial groups is expected to reduce the likelihood that strain will result in antisocial coping mechanisms.

Adolescent Poly-Victimization

In this portion of the literature review, I seek to emphasize the importance of continued exploration of the deleterious outcomes associated with adolescent poly-victimization. To this end, I begin by discussing trends in adolescent victimization (i.e., who is most likely to be victimized and whom they are most likely to be victimized by). Then, I explore extant literature

on negative outcomes associated with poly-victimization, such as increased substance use and delinquency.

Trends in Adolescent Victimization

People are more likely to be victimized by someone they know, rather than a stranger (Hullenaar & Ruback, 2020). This holds true for adolescents, who tend to be victimized by family members or peers more than anyone else. In a report for the Office of Juvenile Justice and Delinquency Prevention, Keith Hullenaar and R. Barry Ruback (2020) detail current adolescent victimization trends using 2018 data from the National Crime Victimization Survey (NCVS). Victimization is typically categorized in three ways: physical, sexual, and property victimizations. Physical victimization refers to physical boundary violations which involve physical contact by coercion or threat of harm, resulting in fear, intimidation, and/or physical injury (Root & Fallon, 1988). Sexual victimization includes acts like rape, sexual harassment and assault, sexual abuse by parents (inappropriate touching and/or rape). Property crimes for adolescents usually include acts like theft and vandalization.

Hullenaar and Ruback (2020) reported that 54% of adolescents between the ages 12 and 17 who were victimized within the last year were victimized by someone they know, and they were most likely to be victimized at school/work (61%) or home (19%). Of this 54% who were victimized by someone they knew, 9% was domestic violence (violent or aggressive behavior within the home) and 45% was acquaintance violence. Using data from the National Survey of Children's Exposure to Violence, Finkelhor and colleagues' (2015) findings support Hullenaar and Ruback's work and highlight the lifetime victimization of adolescents. By the time respondents reached ages 14-17 years, 21.6% had experienced assault by an adult, 29.1% experienced assault by a sibling, 42.4% had been assaulted by a peer, and 17.9% had been

harassed online or over the phone (Finkelhor et al., 2015). Perhaps the most troubling statistic is that of the 1,684,289 violent victimizations of juveniles between 2016 and 2018, nearly 75% were *not* reported to police (Hullenaar and Ruback, 2020).

Hullenaar and Ruback (2020) also provided demographic characteristics for adolescent victimizations. These data reflect the disproportionate rates at which minorities are victimized. For instance, adolescent victimization rates per 1,000 people suggested approximately 40 white, 35 African-American, 26 mixed race, and 23 Hispanic juveniles between the ages 12 and 17 were victimized. Male respondents were victimized at higher rates than females – 41 and 26 victimizations per 1,000 people, respectively. With regards to categories of victimization, Hullenaar and Ruback (2020) reported that per 1,000 people, 24 juveniles experienced simple assault, five experienced aggravated assault, three experienced robbery, and three experienced sexual violence. Finkelhor and colleagues (2015) made the important distinction that while males are generally more likely to be victimized, females experience all forms of sexual victimization (sexual assault, harassment, rape, and sexual abuse by parents) at higher rates than males (p. 750-751). In terms of experiencing maltreatment, physical abuse, emotional abuse, and sexual abuse or neglect in the last year (not included in the NCVS data), adolescents between the ages of 14 and 17 experience higher rates than the younger age ranges in the study. For instance, 38.1% of adolescents ages 14-17 experienced some form of maltreatment in their lifetime (p. 750).

While victimization alone is of significant concern in the field of criminology, what makes victimization experiences especially important to study are the residual effects, particularly for poly-victims who have been victims of *multiple* types of victimizations. Poly-victimization research generally focuses on three deleterious outcomes: mental health, delinquency, and substance use. Research indicates that poly-victimization is a consistent

predictor of trauma symptoms, such as depression, anxiety, and anger/aggression (Finkelhor, Omrod, & Turner, 2007; Ford, Elhai, Connor, & Frueh, 2010; Mitchell, Moschella, Hamby, & Banyard, 2020; Källström et al., 2020; Rapsey, Scott, & Patterson, 2018). For instance, Finkelhor and colleagues (2007) found a weaker association between a single victimization type, which includes experiencing *one* or *several* instances of the *same type* of victimization and trauma symptomatology (depression, anxiety, anger/aggression) when poly-victimization is accounted for in statistical models. In other words, poly-victims tend to be *more* symptomatic than single victims. Importantly, there is evidence that the influence of single measures of victimization on trauma symptomatology can be *overestimated* when analyses do not account for poly-victimization. Further, consistent with general strain perspectives, Mitchell and colleagues (2020) summarize the *cumulative* impact of poly-victimization on mental health outcomes. As victimization grows more persistent (taking place over a longer period of time) and more diverse (experiencing different forms of victimization), measures of mental health decline. Thus, the effects of poly-victimization may be most pronounced when four or five categories of victimization are experienced, as opposed to just two.

Poly-victimization, Delinquency, and Substance Use

Poly-victimization is positively associated with three primary outcomes: substance use/ abuse (Afifi et al., 2020; Davis et al., 2018, 2019; Davis, Ingram, Merrin, & Espelage, 2020; Duncan, 1999; DuRant et al., 2000; Farrell & Zimmerman, 2017; Ford & Delker, 2018; Ford et al., 2010; Kilpatrick et al., 2000; Widom, Ireland, & Glynn, 1995), mental health issues, like depression, anger, and anxiety (Anumba, DeMatteo, & Heilbrun, 2012; Cinamon, Muller, & Rosenkranz, 2014; Copeland et al., 2013; DuRant et al., 2000; Finkelhor, Turner, & Omrod, 2006; Ford & Delker, 2018; Hasselle et al., 2017; Higgins & McCabe, 2000; Kallstrom et al.,

2020; Mitchell et al., 2020; Rapsey, Scott, & Patterson, 2018; Rose et al., 2011; Segura et al., 2016; Soler et al., 2012; Zinow et al., 2009), and delinquency (Cuevas et al., 2007; Davis et al., 2018; DuRant et al., 2000; Farrell & Zimmerman, 2017; Ford et al., 2010; Rose et al., 2011; Wemmers et al., 2017).

Poly-victimization increases the likelihood of being involved in delinquency (Farrell & Zimmerman, 2017; Ford et al., 2009). For example, exposure to violence (being violently victimized, witnessing violent victimization, or being threatened with violent victimization) is positively associated with later violent and property crime offenses as well as substance use (Farrell & Zimmerman, 2017). Additionally, poly-victimization has been shown to have a stronger influence on offending outcomes than any single category of victimization (Ford et al., 2009; Farrell & Zimmerman, 2017; Van Berkel et al., 2018). For instance, Van Berkel and colleagues (2018) demonstrated that victimization by siblings alone did not influence deleterious outcomes (e.g., self-reported trauma symptoms (anger, depression, and anxiety), parental ratings of child trauma symptoms, and delinquency, but *sibling victimization in conjunction with parental abuse* increased the likelihood of delinquency (Van Berkel et al., 2018, p. 249). Importantly, key to the present study, researchers have explored extensively the relationship between experiencing poly-victimization and *adolescent* substance use outcomes, but not adult substance use.

Poly-victimization has consistently displayed a positive relationship with *adolescent* substance use (Afifi et al., 2020; Davis et al., 2018; Davis et al., 2019; Farrell & Zimmerman, 2017; Wojciechowski, 2020). In studies assessing the influence of poly-victimization on measures of substance use, such as cigarette use, use of alcohol and/or binge drinking, or use of marijuana and other illicit substances in the past month or past six months, there are consistent

cumulative effects of poly-victimization. As adolescent respondents are exposed to more unique types of victimization, they report higher rates of substance use (Afifi et al., 2020; Davis et al., 2018; Farrell et al., 2017; Wojciechowski, 2020). For instance, Farrell and colleagues (2017) found that across all types of substance use (alcohol, cigarettes, marijuana, and use of harder drugs like cocaine and heroin) there was a significant positive association between any exposure to violence and substance use. Further, the highest odds of using any substance, with the exception of alcohol, were associated with experiencing at least two incidents of two or more types of victimization (poly-victimization) (Farrell et al., 2017, p. 31).

While the research is limited, there is some evidence that poly-victimization is also associated with an increased risk of substance use into adulthood by adolescents with an existing substance use disorder (Wojciechowski, 2020). Davis and colleagues (2019) explored the relationship between poly-victimization and substance use disorder diagnoses among adolescents entering substance use treatment. Davis and colleagues (2019) reported that adolescents classified as poly-victims with high harmful trauma characteristics (e.g., chronicity of abuse, closeness of perpetrator, fear for life or injury, and negative actions to disclosure) were more likely to be diagnosed with tobacco or opioid use disorder, and they were more likely to have a dual diagnosis (mental health disorder paired with a substance use disorder). With more research targeted at understanding relationships between victimization histories and substance use disorders, it is possible that substance use programs will be more equipped to address the needs of their patients.

Adult Substance Use

Several studies have produced findings that support a positive relationship between forms of strain, particularly victimization, and both adolescent and adult substance use (Chassin et al.,

2002, 2004; Ford, 2014; Lee et al., 2013; Merline et al., 2004). In this section, I outline the forms of strain commonly shown to significantly influence adult substance use, such as prior substance use, family substance use (Chassin et al., 2002, 2004; Dawson, 2000), mental and/or physical health problems (Ford, 2014; Ford & Schroeder, 2009; Hoffman & Su, 1997; Kirst et al., 2014; Stogner & Gibson, 2011), economic strain (Lee et al., 2013; Merline et al., 2004), and victimization (Tripodi & Puttus-Davis, 2013; Tyler & Melander, 2015).

Substance use during adolescence has consistently been shown to be correlated with substance use during adulthood (Artega, Chen & Reynolds, 2010; Chassin, Prost, and Pitts, 2002; Chassin, King & Flora, 2004; Moss, Chen & Yi, 2014; Nelson et al., 2015; Merline et al., 2004). While adolescent substance use is not the focus of this study, its predictors are of value as they provide insight into the influence of strain on substance use. In a study of substance use by adolescents, Chassin and colleagues (2002) noted the environmental strain that children of alcoholics often experience. This strain comes in the form of increased likelihood of environmental stress, living in a single-parent household, reduced levels of parental supervision and support, and experiencing high family conflict (p. 68). Chassin and colleagues (2002) found evidence that individuals who experienced environmental strains associated with being children of alcoholics were more likely to have an earlier onset of substance use than those who did not experience these strains (p. 75). Findings that early onset substance use is associated with environmental strain are replicated by Chassin and colleagues (2004) and Artega and colleagues (2010). The significance of these findings, as they relate to the present study, rests in the strong association between early onset substance use and adult substance use. In other words, knowing that environmental strain leads to early onset substance use is important because we know that

early onset substance use is a common correlate of adult substance use (Brook et al., 2002; Gil et al., 2004).

Physical and mental health may also be strains conducive to adult substance use. Poly-victimization may be thought of as a physical and mental health strain because of the level of physical damage that can come from various forms of victimization, as well as the established link between poly-victimization and depression, anxiety, and PTSD. Using data from the Welfare, Children, and Families Project, Schroeder and colleagues (2011) found a positive association between poor health and offending. Similarly, Stogner and Gibson (2011), using Add Health data, also found a positive association between poor health and offending. Ford (2014) builds from these studies by arguing explicitly that poor health should be treated as a strain in the field of criminology, as it fits Agnew's General Strain Theory in the following ways: 1) it hinders people from achieving prosocial goals, 2) it often results in the loss of positive stimuli, such as participation in the community and even the family, and 3) it acts as its own unique negative stimuli, as it lowers people's quality of life and can be a long-term/chronic source of strain (p. 656). In his study using data from the 2011 National Survey on Drug Use and Health, Ford finds that health strain is positively associated with psychological distress, which then increases the risk of substance use (p. 661). Again, poly-victimization can be considered a health strain because of the long-term physical and mental consequences for victims.

Victimization itself has long been established as a form of strain connected to crime (Agnew, 1996, 2002, 2013; Finkelhor, Omrod, & Turner, 2009; Ford, Elhai, Connor, & Frueh, 2009; Mitchell, Moschella, Hamby, & Banyard, 2020). However, the relationship between victimization and adult substance use has not received nearly the amount of attention the relationship between victimization and adolescent substance use has. Still, there is some

empirical evidence suggesting a relationship between victimization and adult substance use (Tripodi & Pettus-Davis, 2012; Tyler & Melander, 2015). Tripodi and Pettus-Davis, for example, used a sample of 125 incarcerated women to analyze their experiences with physical and sexual victimization as children and their subsequent mental health and substance use habits as adults. Their results indicated that, like with adolescents, experiencing physical and/or sexual victimization during childhood increased negative psychological and criminal justice outcomes (p. 37). More specifically, the women in the study who were victims of sexual and/or physical abuse were more likely to have been hospitalized for a psychological or emotional problems, more likely to have attempted suicide, and more likely to have a diagnosable substance use disorder (p. 36). Tyler and Melander (2015) conducted a somewhat similar study of male, homeless, young adults. The sample is not a perfect replication of Tripodi and Pettus-Davis' sample, but it does provide insight about young male adults' experiences with sexual and physical abuse as children and how it is associated with their substance use habits as adults (p. 507). Like Tripodi and Pettus-Davis, Tyler and Melander (2015) found that young men who reported high instances of child sexual and physical abuse were significantly more likely to report higher frequencies of substance use compared to their counterparts (p. 513). While these studies provide insight about adolescent victimization and adult substance use, there remains a dearth of research examining the links between multiple forms of victimization, social support (a potential strain coping mechanism) and adult substance use. Thus, the current study seeks to fill this gap in the literature by examining the relationship between adolescent poly-victimization, social support, and several forms of substance use by adults (e.g., tobacco, alcohol, marijuana, and harder drugs).

Social Support

Literature surrounding victimization has increasingly considered the role of perceived social support in reducing the level of negative affect and criminal coping in response to strains (Cohen & Syme, 1985; Colvin, Cullen, & Vander Ven, 2002; Cullen, 1994; Huang, Edwards, & Laurel-Wilson, 2020; Kort-Butler, 2010; Lictitra-Kleckler & Waas, 1993; Robbers, 2004; Vannucci et al., 2021; Windle, 1992). Cullen (1994), presented a detailed argument for a social support paradigm in the field of criminology, pulling largely from social ecological and criminological studies that already examined this concept under the guise of social control. Cullen discusses two key types of *actual and perceived* social support— *instrumental* social support and *expressive* social support (p. 530). Instrumental support refers to providing material provisions, such as employment or loans, other forms of financial assistance, or advice and guidance, such as talking to a friend or family member employed by the criminal justice system about how to navigate a criminal charge (Cullen, 1994; Lin, 1986; Vaux, 1988). On the other hand, expressive support refers to the provision of love, affection, esteem, and sense of belonging via emotional support, social reinforcement, and socializing (Lin, 1986). Cullen (1994) noted that these forms of support vary at the national, community, and family level, and they are provided by informal relations or formal agencies, like schools, the criminal justice system, and government assistance programs (p. 531).

Cullen (1994) made several propositions regarding social support. First, Cullen argued that communities lacking social support will have higher crime rates. Conversely, Cullen asserted that the more support offered *to* families and subsequently *by* families, the lower crime rates will be. Similarly, the more social support people are exposed to across their life cycles, the less likely they will be to commit crime. Cullen also argued that when social support in favor of commitment to prosocial norms exceeds social support in favor of crime, crime is less likely to

occur. For example, helping someone with job applications or taking them to work will reduce the likelihood of them committing crime versus introducing them to an illegal form of moneymaking or showing them how to steal a car for transportation. Finally, Cullen posited that social support can mitigate the effects of victimization. At the community level, Cullen cited research indicating that government assistance programs for lower class families tend to lower crime rates (p. 534).

Along with this evidence supporting efficacy of instrumental social support described in the previous paragraph, there is also evidence that expressive social support matters at the community level. In communities characterized by family disruption, weak friendships, and low levels of participation in local organizations, crime rates are higher in part because of reduced parental supervision and reduced access to adult support and subsequent intimate relations for young people (p. 535). At the family level, Loeber and Stouthamer-Loeber (1986) found that support elements, such as the amount of "intimate communication, confiding, sharing of activities, and seeking help," are inversely related to delinquency rates, even more so than common correlates like absence of parents, parental criminality, and conflict between parents.

Building on the propositions set forth by Cullen (1994), Colvin and colleagues (2002) asserted that differential exposure to social support and coercion can influence involvement in crime. Coercion, derived from strain theory, is defined as the threatened or actual removal of social supports, or "a force that compels or intimidates an individual to act because of the fear or anxiety it creates," (p. 19). Colvin and colleagues argued that consistent provision of social support from prosocial sources will result in lower levels of anger, higher self-control, higher levels of prosocial behavior, and lower engagement in crime (p. 27). Consistent social support from sources promoting conformity will lead to these positive outcomes because receivers of the

support will be more likely to trust the givers of the support, allowing for the creation of strong bonds and moral commitment (p. 25). On the other hand, the erratic provision of social support will yield lower self-control, higher levels of anger, and heightened propensity for exploratory deviance, leading to moderate-to-chronic levels of criminal behavior (p. 27). Similarly, the erratic provision of coercion will result in individuals more likely to engage in chronic criminality (p. 28).

Several researchers have since provided empirical support for the theoretical relationship between strain, social support, and deleterious outcomes (Compas et al., 1986; Huang et al., 2020; Kort-Butler, 2010; Mulla, Bogen, and Orchowski 2020; Robers, 2004; Stadler et al., 2010; Vannucci et al., 2021). Perceived social support is most often operationalized using respondents' answers to questions about their perceived closeness to family, friends, and teachers and whether they can rely on those people for support if necessary. For example, Huang and colleagues (2020) measured social support with eight questions contained in the Add Health survey. These questions measured how much respondents felt their family/friends/ teachers cared about them and how much they felt their family had fun together and paid attention to them. Huang and colleagues (2020) found a significant interaction effect of social support on the relationship between living in a disadvantaged area (a potential strain) and depressive symptoms—as social support increased, depressive symptomatology decreased, regardless of level of disadvantage. Further, Kort-Butler (2010) used Add Health data and found that personally experiencing or witnessing victimization during adolescence contributed to delinquency (p. 502). However, those who reported high levels of social support and self-esteem were not adversely impacted by victimization in the way that those with low levels of these resources were. Similarly, using the National Youth Survey (NYS), Robbers (2004) found that social support is negatively correlated

with delinquency when measures of strain were high (p. 559). These studies serve as empirical support for the theoretical relationship between strain, social support, and negative outcomes, as established by Cullen (1994) as well as Colvin and colleagues (2002).

Alternatively, Licitra-Keckler and Waas (1993) operationalized social support by separating peer support and family support using questions like those posed above. Licitra-Keckler and Waas (1993) used data from a group of 11th and 12th graders who indicated elevated levels of stress and found that higher levels of perceived family support were associated with lower levels of depression symptomatology, less frequent alcohol and drug use, and less involvement in minor or serious delinquency (p. 389-91). However, they did not find a significant relationship between levels of peer support and involvement with substance use or crime. Further, individuals with high levels of both peer *and* family support were more likely to engage in school and family offenses (p. 391). It seems the findings regarding the effects of perceived social support are mixed—some studies report inconsistent effects of perceived social support or no effect at all (i.e., peer support) (Friedrich et al., 1982; Licitra-Keckler & Waas, 1993). This illustrates both the inconsistent nature of findings in social support literature and the need for further investigation into the role of family and peer support in the relationship between strain and criminal coping.

The Current Study

Adolescent poly-victimization can be considered a strain resulting in long-term negative affect, which may be alleviated with substance use. The deleterious effects of adolescent poly-victimization will depend on the magnitude, duration, recency, and clustered nature of victimization experiences (Agnew, 1992; Avison and Turner, 1988; Folger, 1986; Pearlin et al., 1981). Further, the availability of social support in adolescence during periods of victimization

measured in this study may moderate the association between adolescent poly-victimization and adult substance use (Cullen, 1994; Colvin et al., 2002; Loeber and Stouthamer-Loeber, 1986). For instance, support from family, friends, teachers, or prosocial groups may reduce the likelihood that adolescent poly-victimization leads to adult substance use. However, research on adolescent poly-victimization and adult substance use is limited and does not consider the potential moderating role of adolescent social support. Therefore, the current study seeks to answer three research questions:

1. What is the main effect of adolescent poly-victimization on adult substance use?
2. What is the main effect of adolescent social support on adult substance use?
3. Does adolescent social support moderate the effect of adolescent poly-victimization on adult substance use?

Consistent with the literature regarding the deleterious effects of poly-victimization, I hypothesize that adolescent poly-victimization will be positively associated with adult substance. While the effects of social support in the literature are mixed, there is some evidence that social support is negatively correlated with delinquency (see Cullen, Kort-Butler, 2010; Huang et al., 2020; Loeber & Stouthamer-Loeber, 1986; Robbers, 2010). Thus, I hypothesize that adolescent social support will be negatively associated with adult substance use. Consistent with Cullen's social support perspective, I hypothesize that social support will mitigate the negative effect of adolescent poly-victimization on adult substance use and will reduce the likelihood that adolescent poly-victimization result in adult substance use.

Methodology

Data

I use the unrestricted public use data from The National Longitudinal Study of Adolescent to Adult Health (Add Health) to answer the three research questions. Add Health is a longitudinal study of a nationally representative sample of U.S. adolescents who were in grades 7 through 12 during the 1994-1995 school year. Add Health respondents were followed into adulthood with five in-home interviews, the last of which were conducted between 2016 and 2018 when the sample was approximately 33-43 years old.

Wave I data was collected from respondents via an in-school survey in 1994-1995 and all subsequent data were collected via in-home interviews. The in-school questionnaire was a stratified, random sample of all high schools in the United States. A school was eligible for the sample if it included an 11th grade and had a minimum enrollment of 30 students. The in-school questionnaire was administered to more than 90,000 students in grades 7 through 12, gathering information on social and demographic characteristics of adolescent respondents, education and occupation of parents, household structure, expectations for the future, self-esteem, health status, risk behaviors, friendships, and school-year extracurricular activities. An in-home sample of students from schools was used to collect additional data on topics including health status, peer networks, decision-making processes, family composition and dynamics, educational aspirations, employment experience, romantic and sexual partnerships, substance use, and criminal activities.

The Wave I in-home interview consisted of 27,000 adolescents. Wave II Add Health data included nearly 15,000 in-home interviews with respondents from Wave I, took place from April to August 1996 (respondents aged 16-18). Wave III data were collected from August 2001 to April 2002 through in-home interviews with 15,170 Wave I respondents (now 18 to 26 years old), as well as interviews with their romantic partners. Respondents answered questions about their family, relationships, sexual experiences, childbearing, educational histories, labor force involvement, religion and spirituality, mental health, illness, delinquency and violence, substance abuse, and involvement with the criminal justice system.

I use data from the first three waves of unrestricted public use Add Health data to examine how adolescent poly-victimization experiences are associated with adult substance use, and the moderating effects of social support on this relationship. Add Health provides comprehensive measures of key variables and is well-suited to answer the proposed research questions. For instance, Wave I provided key demographic variables, Wave II provided data on *adolescent* poly-victimization and social support, while Wave III provides the first Add Health data on *adult* substance use. The longitudinal nature of the data allows time order to be preserved.

Dependent Variables

The current study examined two substance use categories by adult respondents at Wave III: marijuana and hard drugs (i.e., cocaine, meth, injected drugs, or "other drugs," such as PCP, LSD, ecstasy, mushrooms, heroin, or inhalants). Marijuana is one of the most commonly used and accessible substances in the U.S., and marijuana and illicit drugs are two of the leading causes of substance use disorders (SAMHSA, 2017; 2018). Therefore, it is important to assess the extent to which these substances are likely to be used by poly-victims.

Marijuana use was assessed with a binary measure indicating whether respondents used marijuana in the 12 months leading up to the Wave III interview. Potential answers were limited to 'Yes,' 'No,' or 'Don't know.' All responses of 'Don't know' and all refusals to answer were coded as 'missing,' while responses of 'Yes' were coded as '1' and responses of 'No' were coded as '0'.

Hard drug use was assessed with a binary measure similar to that of marijuana. Respondents were asked if they had used cocaine, meth, "other drugs" (i.e., PCP, LSD, ecstasy, mushrooms, heroin, or inhalants), or injected drugs in the 12 months leading up to the Wave III interview. Potential answers were limited to 'Yes,' 'No,' or 'Don't know.' All responses of 'Don't know' and refusals were coded as 'missing,' while responses of 'Yes' were coded as '1' and responses of 'No' were coded as '0'. These four binary variables were then combined into one binary hard drug use variable using the *egen* command and *rowmax* option in Stata 16. Participants who used cocaine, meth, "other drugs", or injected drugs in the last 12 months were coded as '1', while participants who had only 'no' responses were coded as '0'.

Independent Variables

The current study examined the influence of *poly-victimization* during adolescence, the key independent variable in this study, on adult substance use. Poly-victimization was measured with an eight-item variety index assessing whether respondents had ever experienced any of the following victimizations—1) threatened with a knife or gun, 2) shot, 3) stabbed 4) jumped, 5) pushed by a romantic partner, 6) threatened with violence by a romantic partner, 7) attempted suicide, and 8) forced to have sex. Each of these eight items are described in detail below.

Wave I and Wave II in-home surveys asked questions assessing whether respondents had been threatened with a knife or gun, shot, stabbed, or jumped in the year preceding the interview.

Possible answers were ‘Never’, ‘Once’, or ‘More than once’, These four measures were recoded to be binary measures where ‘0’ indicated respondents never experienced these four distinct victimizations and ‘1’ indicated respondents experienced these four distinct victimizations at least once in the last year. Next, I used the ‘egen’ command and ‘rowmax’ option in Stata to combine the four Wave I and four Wave II binary victimization measures to identify unique victimization experiences and to ensure duplicate victimizations were not counted in the final poly-victimization scale. For instance, if a respondent was jumped at Wave I and Wave II, using the original binary measures would count these as two victimization experiences. However, poly-victimization refers to *distinct* victimizations and double counting someone who was jumped at Waves I and II would not be consistent with the poly-victimization literature’s measurement strategies. Therefore, this approach allowed me to correctly identify and count each unique victimization experience.

Partner pushing and *partner threatened violence* were measured at Wave II. Respondents were asked separately if they had *ever* (1 = yes, 0 = no) been pushed or threatened with violence by each unique romantic partner. Similar to the approach described above designed to count unique victimization experiences, these two questions inquiring about romantic partner violence were combined into two binary measures indicating whether respondents had ever experienced either type of romantic partner victimization across all romantic partnerships.

Forced sex was measured at Wave I, where respondents were asked whether they had been forced to have sex against their will within the last year (1 = yes, 0 = no). *Attempted suicide* was also measured at Wave I by asking respondents how many times in the last year they had attempted suicide on a 0 to 4 Likert scale (0 = “0 times”, 4 = “6 or more times”. I recoded the measure into a binary variable where “0” indicated they never attempted a suicide and “1”

indicated they attempted suicide. While attempted suicide is not discussed in the victimization literature, it is included in this study because it is a form of trauma and can cause or amplify existing physical health problems or trauma responses (e.g. PTSD, depression, anger, or hopelessness) that are predictive of maladaptive behavior (Ford, 2014; Zatti et al., 2017). These eight binary victimization measures were summed to create a variety index indicating the number of unique victimization experiences.

Moderator Variables

This study examined the moderating influence of adolescent *social support* on the adolescent poly-victimization and adult substance use association. Social support was measured using 23 variables from Wave II, which were used to create *three* scales measuring unique types of social support. Each scale is described in detail below. It is important to note that the social supports I treat as coping mechanisms in this study are also consistent with a social bonds framework, which suggests that prosocial ties to other individuals and institutions reduce the likelihood of maladaptive behaviors (Hirschi, 1969). In sum, while I treat social support as a coping mechanism that could moderate the association between strain from poly-victimization and drug use in a general strain framework, a social control perspective is consistent with this approach in that bonds, which are social supports, would also reduce the likelihood of using substances or other maladaptive behaviors.

School social support was assessed with 6 items measured on a Likert scale (1= strongly disagree or not at all, 5 = strongly agree or very much) indicating the extent to which respondents perceived 1) they were close to people at school, 2) were happy at their school, 3) felt like they were part of their school, 4) how much they perceived teachers cared about them, 5) how much they perceived adults cared about them, and 6) how much they perceived their school friends

cared about them. These 6 measures were combined into a mean school support scale (α=.73) where higher values indicated greater school support.

Parental support was measured with 14 Likert scale items (1 = strongly disagree, not at all, or never, 5 = strongly agree, very much, or always) indicating 1) maternal closeness, 2) paternal closeness, 3) how much mom cares about me, 4) how much dad cares about me, 5) maternal warmth, 6) paternal warmth, 7) total parental closeness, 8) love shown by parents, 9) fun with family, 10) familial attention, 11) mom present when I leave for school, 12) dad present when I leave for school, 13) mom present when I return home from school, and 14) dad present when I return home from school. These measures were combined into a mean scale (α=.71) encompassing the concepts of parental care, warmth, and supervision where higher scores indicate greater parental support.

Religiosity was assessed with three items measured on a Likert scale (1= never or not important at all, 4= once a week or more or very important) indicating how often respondents attended church services in the last year, how often respondents attended church youth groups in the last year, and how important religion was in respondents' lives. A mean religiosity scale (α=.72) was created from these three variables where higher scores indicated more higher levels of religious themed social support.

Control Variables

The current study controlled for age, sex, race, and income, and in supplemental models (Tables 9-14), prior substance use was also accounted for. *Age* at Wave III was calculated by interviewers using the birth dates of respondents provided in Wave I interviews. The range at Wave III was 18-to-28-years-old. Age was mean centered to improve the interpretability of the constant in regression models (Iacobucci et al., 2016). *Income* was assessed at Wave I by asking

respondents to indicate how much total income their family earned in 1994. The income responses ranged from 0-to-999 and were measured in thousands of dollars (e.g., 999 = $999,000). *Race* was assessed at Wave I by asking respondents to identify their race (white, Black, Native American, Asian or Pacific Islander, or other), selecting multiple categories if necessary. Respondents were also asked whether they were of Hispanic origin. I combined the race and ethnicity measure to create a race variable indicating respondents who identified as Hispanic, non-Hispanic White, non-Hispanic Black, non-Hispanic Native American, non-Hispanic Asian, and non-Hispanic other race.

Prior substance use was assessed using measures from Wave II. *Prior substance use* is a variety index that counted whether respondents used the following seven substances (or drug use modality) at Wave II—cigarettes, alcohol, marijuana, cocaine, inhalants, "other drugs", or injected drugs. Zero on this variety index indicated that respondents did not use any of the listed substances, while a '1' indicated that respondents used one of the seven substances listed. Thus, higher values indicated a wider variety in substance use practices.

Whether analyzed from a state dependence or a population heterogeneity lens (see Nagin & Paternoster, 2000), prior engagement in deviance, including crime and substance use, is consistently found to be predictive of future deviance (Nagin & Paternoster, 2000). Population heterogeneity refers to the idea that deviance is stable over time due to the presence of antisocial characteristics, such as low self-control and impulsivity, that lead to deviant behavior. Differences in biology, socialization, and/or personality result in differing levels of these antisocial characteristics across individuals, which differentially influences behavior across the life course (Nagin & Paternoster, 2000, p. 119). On the other hand, state dependence posits that prior deviance is associated with future deviance because it changes one's life circumstances in a

way that makes continued deviance more likely. Deviance can not only weaken one's prosocial bonds, but it can also strengthen their bonds to other people who engage in deviance, thus increasing the incentives associated with continued deviance (Nagin & Paternoster, 2000, p. 118). With substance use as a specific form of deviance, Petraitis and colleagues' (1998) meta-analysis of substance use disorder studies found support for prior cigarette, alcohol, marijuana, and/or narcotic use as predictors of later substance use. For these reasons, it is theoretically important to control for prior substance use. However, its inclusion as a control variable in the primary models would make it impossible to assess the main effect of poly-victimization, which has received less attention, as prior substance use would account for a larger portion of the variance in adult substance use. Therefore, I present findings from models without controlling for substance use to assess the main effects of adolescent poly-victimization and strain on adult substance use then present findings from supplementary models that control for prior substance use.

Analytic Strategy

The current study employed a series of logistic regression analyses to assess the relationship between poly-victimization, social support, and adult substance use while controlling for age, race/ethnicity, sex, and income. A primary assumption of logistic regression is that outcome variables are dichotomous. Recall that the two substance use outcome variables described above are dichotomous – respondents answered yes or no to having used marijuana or hard drugs within the last year. A second assumption of logistic regression is no multicollinearity amongst predictor variables. Multicollinearity was assessed in two ways: by running correlations on all independent variables and by examining variance inflation factors (VIF) after each regression. All correlations between independent variables were low, with none exceeding 0.15.

Table 1: Descriptive Statistics

Variable	Obs	Mean	Std.Dev.	Min	Max
Dependent Variables					
1. Marijuana Use [c]	4880	.319	.466	0	1
2. Hard Drug Use [c]	4881	.12	.325	0	1
Independent Variables					
1. Poly-victimization [d]	6482	.489	.884	0	4
a. 0 types	4519	69.48%			
b. 1 type	1174	18.05%			
c. 2 types	468	7.20%			
d. 3 types	223	3.43%			
e. 4+ types	98	1.51%			
2. Social Support [b]					
a. School Support	4830	3.941	.641	1	5
b. Parental Support	4831	4.066	.507	1.556	5
c. Religiosity	4132	2.851	.842	1	4
Controls					
Age*[c]	4882	0	1.811	-3.824	6.176
Race [a]	6477	1.755	1.125	1	6
a. NH-White	3720	57.20%			
b. NH-Black	1518	23.34%			
c. Hispanic	743	11.42%			
d. NH-Native Am.	172	2.64%			
e. NH-Asian Am.	250	3.84%			
f. NH-Other	74	1.14%			
Sex [a]	6503	.484	.5	0	1
a. Male	3147	48.39%			
b. Female	3356	51.60%			
Income*[a]	4929	47.701	56.355	0	999
Prior Substance Use [b]	4812	1.285	1.312	0	7

* Income measured in thousands of dollars
*Age mean centered: original range was 18-26 years
a: Wave I measure
c: Wave III measure
b: Wave II measure
d: Wave I & II measure

While there are different opinions about what acceptable/unacceptable VIFs are, often VIFs of 4 or 10 are used rules of thumb for indicating multicollinearity (O'Brien, 2007). None of the mean VIFs in my analyses exceeded 1.5 and no VIF of individual variables exceeded 4, indicating no multicollinearity. A third assumption of logistic regression is a sufficiently large sample size. According to Bujang and colleagues (2018), a minimal sample size for logistic regressions can be calculated using the equation n= 100 + 50*i*, where *i*= number of independent variables. The models in this study contained six independent variables, thus the minimum sample size was 400 (100 + 50*6 = 400); the smallest sample size in my analyses was 2611. With these assumptions satisfied, logistic regression was chosen as the final statistical method.

I ran a series of logistic regressions for each outcome, poly-victimization, and the three social support scales. Model 1 of each regression table displays results for substance use (marijuana or hard drugs) as the outcome variable and poly-victimization as the predictor variable, while controlling for age, race/ethnicity, sex, and income. Model 2 of each table presents results for substance use as the outcome variable and social support (school support, parental support, or religiosity) as the predictor, controlling for the same four demographic variables. Model 3 presents results for substance use as the outcome with poly-victimization *and* social support as predictor variables and the same controls. Model 4 in each table displays regression results for the same variables described in Model 3, with the addition of a variable accounting for the interaction between poly-victimization and social support. I present odds ratios in tables and transform the odds ratios into percentages for interpretation purposes.

It is important to note that when multiplicative interaction terms were added to models with their components, the standard errors of all predictors in the model become inflated because

of multicollinearity (common in models with main effects *and* interactions) among the primary independent variables (i.e., poly-victimization and social support) and their interaction term. To address this issue, I created mean centered versions of the poly-victimization and social support variables, as well as interaction variables using these mean centered measures. Centering reduces multicollinearity and standard errors, allowing for more accurate model specification (Iacobucci et al., 2016). Moreover, in Model 4 of each table, poly-victimization and social support (school, parental, or religiosity) are mean centered, and the interactions reflecting these mean centered variables are presented. Since main effects are not interpretable in models with interaction terms, Model 3 in each table remains the best model to discern the effects of poly-victimization and social support.

Results

Descriptive Statistics

Descriptive statistics are displayed in Table 1. Approximately 30% of the sample experienced victimization during adolescence, with 12% having experienced poly-victimization (i.e., more than one type of victimization). On average, respondents reported high levels of all social supports, with the average respondent scoring four out of five on the school support and parental support scales, and nearly three out of four on the religiosity scale. Prior to mean centering age, the average respondent was 21.82 years, with a range of 18-to-28 years. Most respondents were non-Hispanic White (57.20%) or non-Hispanic Black (23.34%), followed by Hispanic (11.42%), non-Hispanic Native American, non-Hispanic Asian American, and "other" race, each at less than 5%. The sample was split almost evenly along sex, with females having slightly more representation (51.6%), and the average annual household income was $47,701.

Results for Research Question 1: What is the main effect of adolescent poly-victimization on adult substance use?

Model 1 examines the effect of poly-victimization on marijuana and hard drug use without controlling for social support. Model 1 in Tables 2, 3, and 4 display odds ratios for the main effect of poly-victimization on marijuana use. The odds of using marijuana in the last year increased by 53.4%, 55.6%, and 127.1% among adolescents who experienced one, two, or three victimizations, respectively. However, those who had experienced four or more types of victimization did not have higher odds of using marijuana compared to those who had not been

victimized. Thus, these findings tentatively suggest that adolescent poly-victimization increases the odds of using marijuana.

Model 1 in Tables 5, 6, and 7 display odds ratios for the main effect of poly-victimization on hard drug use. Respondents who experienced one form of victimization were 35.4% more likely to have used hard drugs in the last year, compared to those who had not been victimized. Respondents who had experienced two types of victimization were 50.9% more likely than those who had not been victimized, to have used hard drugs in the last year. Similar to marijuana, there was also a large increase in the odds of having used hard drugs in the last year for people who had experienced three kinds of victimization, with their odds being 136% higher than those who had not reported being victimized. However, those who had experienced four or more types of victimization were not significantly more likely to report past-year hard drug use. Moreover, these findings also appear to suggest that adolescent poly-victimization increases the odds of adult marijuana and hard drug use.

Results for Research Question 2: What is the main effect of adolescent social support on adult substance use?

Model 2 in each of the regression tables examines the effect of social support on marijuana and hard drug use without controlling for poly-victimization. Model 2 in Tables 2 and 5 displays odds ratios for past-year marijuana and hard drug use for *school support.* As average levels of school support increased, the odds of using marijuana decreased by 21.4% and the odds of using hard drugs decreased by 21.7%. Model 2 in Tables 3 and 6 present findings for *parental support.* Like school support, the odds of using marijuana decreased by 41% and the odds of using hard drugs decreased by 27.6% when average parental support increased. Model 3 in Tables 4 and 7 show findings for religiosity and adult drug use. Like parental and school support,

when average religiosity increased, the odds of using marijuana decreased by 23.9% and the odds of using hard drugs decreased by 25.4%. These findings indicate that social support does appear to decrease the odds of marijuana and hard drug use.

Model 3 in each Table displays findings that include both poly-victimization and social support as predictors. Logistic regression results for marijuana use and hard drug use by poly-victimization and *school support* are displayed in Model 3 of Tables 2 and Table 5, respectively. After controlling for school support, the odds of using marijuana in the last year increased by 46.1%, 53.2%, and 113.4% among adolescents who experienced one, two, or three victimizations, respectively. In other words, unique victimization experiences still significantly increased the odds of marijuana use in the last year even when controlling for school support. We see a similar pattern of results for school support as we saw in Model 2 whereby increases in average school support decreased the odds of past year marijuana use by 16.7%. Findings for hard drugs mimic findings for marijuana use. Again, school support decreased the odds of hard drug use by 16.5% while experiencing one, two, or three victimizations increased the odds of hard drug use by 34.6%, 52.2%, and 150%, respectively.

Model 3 of Tables 3 and Table 6 displays findings for the *parental social support* measure and poly-victimization on marijuana and hard drug use, respectively. Victimization continued to increase the odds of marijuana use, even when controlling for parental support—experiencing one, two, or three unique victimizations increases the odds of marijuana use by 42.5%, 48.3%, and 109.4%, respectively. Parental support also remained a significant predictor of past-year marijuana use after controlling for poly-victimization, with folks being 37.7% less likely to have used marijuana as school support increased. Findings for hard drugs are identical to findings for marijuana—parental support decreased the odds of hard drug use by 22.3% and

one, two, or three victimizations increased the odds of hard drug use by 34.9%, 53.6%, and 154.2%.

Logistic regression results for marijuana use and hard drug use by poly-victimization and religiosity are displayed in Model 3 of Tables 4 and 7, respectively. Poly-victimization remained a significant predictor of past-year marijuana use after controlling for religiosity. The experience of one, two, of three types of victimization increased the odds of marijuana use by 62.6%, 49.4%, and 138.9%, respectively. Religiosity also remained a significant predictor of past-year marijuana use after controlling for poly-victimization and lowered the odds of marijuana use by 22.7%. Model 3 in Table 7 displays odds ratios of past-year hard drug use. Those who had experienced one, two, or three types of victimizations were 59.5%, 64.7%, and 159.1%. Religiosity also remained a significant predictor of past-year hard drug use after controlling for poly-victimization, with respondents being 23.5% less likely to have used hard drugs as school support increases. In sum, adolescent poly-victimization experiences (i.e., experiencing two or three unique victimizations) significantly increase the odds of adult marijuana and hard drug use while school, parental, and religious social supports decrease the odds of adult marijuana and hard drug use.

Results for Research Question 3: Does adolescent social support moderate the effect of adolescent poly-victimization on adult substance use?

Regarding the third research question of whether social support moderates the effect of poly-victimization on substance use, it is important to note that *no* interaction terms were statistically significant in any model (see Model 4 in Tables 2-7), which suggests that while there are main effects of poly-victimization and social support on adult substance use, social support does not mitigate the effect of poly-victimization on adult substance use.

Table 2: Logistic Regression results for Marijuana (Moderator: School Support)

	Model 1	Model 2	Model 3	Model 4
Poly-victimization	---	---	---	1.228 (0.059)[a]
1 Poly-Vic.	1.534*** (0.143)	---	1.461*** (0.153)	---
2 Poly-Vic.	1.556** (0.224)	---	1.532** (0.240)	---
3 Poly-Vic.	2.271*** (0.413)	---	2.134*** (0.411)	---
4 Poly-Vic.	1.142 (0.377)	---	1.098 (0.394)	---
School Support	---	0.786***(0.047)	0.833** (0.051)	0.831*(0.051)[a]
Age	0.869*** (0.017)	0.880*** (0.021)	0.867*** (0.021)	0.604*** (0.021)
Black	0.610*** (0.0567)	0.630*** (0.066)	0.603*** (0.064)	0.603*** (0.064)
Hispanic	0.704** (0.0881)	0.705* (0.097)	0.669** (0.092)	0.671** (0.093)
Native Am.	0.818 (0.167)	0.882 (0.194)	0.826 (0.186)	0.827 (0.187)
Asian Am.	0.638* (0.139)	0.517** (0.130)	0.507** (0.130)	0.508** (0.130)
Other	0.933 (0.317)	0.962 (0.355)	0.923 (0.350)	0.917 (0.345)
Male	1.563*** (0.112)	1.552*** (0.122)	1.486*** (0.118)	1.489*** (0.118)
Income (thousands)	1.002* (0.001)	1.002* (0.001)	1.002* (0.001)	1.002* (0.001)
Poly-Vic.* School Support	---	---	---	1.017 (0.064) [a]
Constant	0.369*** (0.026)	1.075 (0.268)	0.765 (0.200)	0.424 (0.033)
N	3755	3033	3032	3032
Pseudo R^2	.03	.03	.03	.03
Wald χ^2	157.8	101.1	125.9	118.3

Odds Ratios (OR) presented; Robust standard errors in parentheses. Zero (0) is the reference category for poly-victimization; Non-Hispanic white race is the reference category; [a] : Centered version of variable used in Model 4; * p <.05; ** p < .01; *** p<.001

Table 3: Logistic Regression results for Marijuana (Moderator: Parental Support)

	Model 1	Model 2	Model 3	Model 4
Poly-victimization	---	---	---	1.221 (0.055)[a]
1 Poly-Vic.	1.534*** (0.143)	---	1.425*** (0.149)	---
2 Poly-Vic.	1.556** (0.224)	---	1.483* (0.233)	---
3 Poly-Vic.	2.271*** (0.413)	---	2.094*** (0.414)	---
4 Poly-Vic.	1.142 (0.377)	---	1.065 (0.382)	---
Parental Support	---	0.590*** (0.047)	0.623*** (0.050)	0.611*** (0.050)[a]
Age	0.869*** (0.017)	0.864*** (0.021)	0.854*** (0.021)	0.854*** (0.021)
Black	0.610*** (0.057)	0.674*** (0.071)	0.641*** (0.068)	0.641*** (0.068)
Hispanic	0.704** (0.088)	0.738* (0.101)	0.698** (0.096)	0.705** (0.096)
Native Am.	0.818 (0.167)	0.906 (0.202)	0.849 (0.193)	0.845 (0.193)
Asian Am.	0.638* (0.139)	0.498** (0.124)	0.489** (0.125)	0.491** (0.124)
Other	0.933 (0.317)	0.985 (0.371)	0.947 (0.361)	0.915 (0.352)
Male	1.563*** (0.112)	1.621*** (0.128)	1.545*** (0.124)	1.548*** (0.124)
Income (thousands)	1.002* (0.001)	1.001* (0.001)	1.002* (0.001)	1.002* (0.001)
Poly-Vic.* Parental Support	---	---	---	1.087 (0.083) [a]
Constant	0.369*** (0.026)	3.406*** (1.109)	2.471** (0.828)	0.410** (0.031)
N	3755	3033	3032	3032
Pseudo R^2	.03	.03	.04	.04
Wald χ^2	157.8	127.5	148.7	144.3

Odds Ratios (OR) presented; Robust standard errors in parentheses. Zero (0) is the reference category for poly-victimization; Non-Hispanic white race is the reference category; [a] : Centered version of variable used in Model 4; * p <.05; ** p < .01; *** p<.001

Table 4: Logistic Regression results for Marijuana (Moderator: Religiosity)

	Model 1	Model 2	Model 3	Model 4
Poly-victimization	---	---	---	1.239 (0.062)[a]
1 Poly-Vic.	1.534*** (0.143)	---	1.626*** (0.184)	---
2 Poly-Vic.	1.556** (0.224)	---	1.494* (0.261)	---
3 Poly-Vic.	2.271*** (0.413)	---	2.389*** (0.524)	---
4 Poly-Vic.	1.142 (0.377)	---	0.861 (0.369)	---
Religiosity	---	0.761*** (0.039)	0.773*** (0.040)	0.770*** (0.040)[a]
Age	0.869*** (0.017)	0.875*** (0.023)	0.861*** (0.023)	0.864*** (0.023)
Black	0.610*** (0.057)	0.779* (0.088)	0.737** (0.084)	0.737** (0.084)
Hispanic	0.704** (0.088)	0.752* (0.109)	0.703* (0.102)	0.720* (0.104)
Native Am.	0.818 (0.167)	0.901 (0.232)	0.837 (0.221)	0.837 (0.221)
Asian Am.	0.638* (0.139)	0.623 (0.172)	0.593 (0.168)	0.601 (0.168)
Other	0.933 (0.317)	0.770 (0.316)	0.753 (0.316)	0.719 (0.302)
Male	1.563*** (0.112)	1.560*** (0.133)	1.489*** (0.129)	1.492*** (0.129)
Income (thousands)	1.002* (0.001)	1.002* (0.001)	1.002* (0.001)	1.002* (0.001)
Poly-Vic.* Religiosity	---	---	---	1.010 (0.056) [a]
Constant	0.369*** (0.026)	0.827 (0.136)	0.697* (0.119)	0.389 (0.033)
N	3755	2612	2611	2611
Pseudo R^2	.03	.03	.04	.04
Wald χ^2	157.8	93.22	123.0	110.3

Odds Ratios (OR) presented; Robust standard errors in parentheses. Zero (0) is the reference category for poly-victimization; Non-Hispanic white race is the reference category; [a] : Centered version of variable used in Model 4; * p <.05; ** p < .01; *** p<.001

Table 5: Logistic Regression results for Hard Drugs (Moderator: School Support)

	Model 1	Model 2	Model 3	Model 4
Poly-victimization	---	---	---	1.310 (0.082)[a]
1 Poly-Vic.	1.354* (0.178)	---	1.346* (0.199)	---
2 Poly-Vic.	1.509* (0.292)	---	1.522* (0.329)	---
3 Poly-Vic.	2.360*** (0.519)	---	2.502*** (0.596)	---
4 Poly-Vic.	1.057 (0.509)	---	1.290 (0.654)	---
School Support	---	0.783** (0.065)	0.835* (0.072)	0.816** (0.070)[a]
Age	0.896*** (0.026)	0.860*** (0.030)	0.846*** (0.030)	0.846*** (0.030)
Black	0.262*** (0.047)	0.260*** (0.054)	0.247*** (0.052)	0.245*** (0.052)
Hispanic	0.851 (0.140)	0.833 (0.154)	0.789 (0.146)	0.781 (0.144)
Native Am.	0.825 (0.235)	1.042 (0.310)	0.982 (0.299)	0.956 (0.292)
Asian Am.	0.891 (0.243)	0.671 (0.227)	0.652 (0.226)	0.651 (0.224)
Other	0.724 (0.345)	1.017 (0.498)	0.937 (0.465)	0.959 (0.474)
Male	1.540*** (0.155)	1.517*** (0.169)	1.442** (0.162)	1.444** (0.162)
Income (thousands)	1.002** (0.001)	1.002** (0.001)	1.002** (0.001)	1.002** (0.001)
Poly-Vic.* School Support	---	---	---	1.163 (0.097) [a]
Constant	0.114*** (0.011)	0.314*** (0.108)	0.218*** (0.080)	0.123** (0.124)
N	3756	3034	3033	3033
Pseudo R^2	.05	.05	.05	.05
Wald χ^2	114.8	86.41	104.5	103.8

Odds Ratios (OR) presented; Robust standard errors in parentheses. Zero (0) is the reference category for poly-victimization; Non-Hispanic white race is the reference category; [a] : Centered version of variable used in Model 4; * p <.05; ** p < .01; *** p<.001

Table 6: Logistic Regression results for Hard Drugs (Moderator: Parental Support)

	Model 1	Model 2	Model 3	Model 4
Poly-victimization	---	---	---	1.277 (0.077)[a]
1 Poly-Vic.	1.354* (0.178)	---	1.349* (0.197)	---
2 Poly-Vic.	1.509* (0.292)	---	1.536* (0.327)	---
3 Poly-Vic.	2.360*** (0.519)	---	2.542*** (0.614)	---
4 Poly-Vic.	1.057 (0.509)	---	1.331 (0.660)	---
Parental Support	---	0.724** (0.080)	0.777* (0.087)	0.757* (0.086)[a]
Age	0.896*** (0.026)	0.851*** (0.030)	0.839*** (0.030)	0.839*** (0.030)
Black	0.262*** (0.047)	0.273*** (0.057)	0.256*** (0.054)	0.255*** (0.054)
Hispanic	0.851 (0.140)	0.865 (0.160)	0.812 (0.151)	0.814 (0.151)
Native Am.	0.825 (0.235)	1.069 (0.317)	1.001 (0.304)	0.978 (0.298)
Asian Am.	0.891 (0.243)	0.667 (0.223)	0.647 (0.223)	0.656 (0.223)
Other	0.724 (0.345)	1.024 (0.510)	0.949 (0.473)	0.914 (0.462)
Male	1.540*** (0.155)	1.572*** (0.175)	1.480*** (0.167)	1.484*** (0.167)
Income (thousands)	1.002** (0.001)	1.002** (0.001)	1.002** (0.001)	1.002** (0.001)
Poly-Vic.* Parental Support	---	---	---	1.098 (0.110) [a]
Constant	0.114*** (0.011)	0.430 (0.193)	0.291** (0.134)	0.119 (0.012)
N	3756	3034	3033	3033
Pseudo R^2	.05	.05	.05	.05
Wald χ^2	114.8	88.01	106.0	101.9

Odds Ratios (OR) presented; Robust standard errors in parentheses. Zero (0) is the reference category for poly-victimization; Non-Hispanic white race is the reference category; [a] : Centered version of variable used in Model 4; * p <.05; ** p < .01; *** p<.001

Table 7: Logistic Regression results for Hard Drugs (Moderator: Religiosity)

	Model 1	Model 2	Model 3	Model 4
Poly-victimization	---	---	---	1.333 (0.084)[a]
1 Poly-Vic.	1.354* (0.178)	---	1.595** (0.252)	---
2 Poly-Vic.	1.509* (0.292)	---	1.647* (0.395)	---
3 Poly-Vic.	2.360*** (0.519)	---	2.591*** (0.715)	---
4 Poly-Vic.	1.057 (0.509)	---	1.609 (0.913)	---
Religiosity		0.746*** (0.053)	0.765*** (0.056)	0.756*** (0.054)[a]
Age	0.896*** (0.026)	0.840*** (0.032)	0.825*** (0.032)	0.827*** (0.032)
Black	0.262*** (0.047)	0.301*** (0.067)	0.279*** (0.063)	0.273*** (0.062)
Hispanic	0.851 (0.140)	0.883 (0.173)	0.816 (0.159)	0.840 (0.162)
Native Am.	0.825 (0.235)	1.116 (0.379)	1.019 (0.359)	1.004 (0.350)
Asian Am.	0.891 (0.243)	0.727 (0.272)	0.682 (0.265)	0.687 (0.263)
Other	0.724 (0.345)	0.652 (0.394)	0.610 (0.377)	0.583 (0.365)
Male	1.540*** (0.155)	1.530*** (0.187)	1.444** (0.177)	1.449** (0.177)
Income (thousands)	1.002** (0.001)	1.002* (0.001)	1.002** (0.001)	1.002** (0.001)
Poly-Vic. *Religiosity	---	---	---	1.109 (0.365)[a]
Constant	0.114*** (0.011)	0.254*** (0.056)	0.206*** (0.048)	0.114*** (0.013)
N	3756	2613	2612	2612
Pseudo R^2	.05	.05	.06	.06
Wald χ^2	114.8	86.99	105.8	103.2

Odds Ratios (OR) presented; Robust standard errors in parentheses. Zero (0) is the reference category for poly-victimization; Non-Hispanic white race is the reference category; [a] : Centered version of variable used in Model 4; * p <.05; ** p < .01; *** p<.001

Control Variables

The effects of control variables can be viewed in Model 3 of each table. Age, across all six models, decreased the odds of having used marijuana or hard drugs within the last year by 10-17%. In other words, for every year increase in age, the likelihood of having used these substances decreased by 10-17%. Males had between 44-54% higher odds of using these substances than females. Income, across all six models, was predictive of a 0.2% increase, per $1,000 increase, in the odds of having used marijuana or hard drugs in the last year. Black respondents had lower odds of using marijuana (26-37%) and hard drugs (72-75%) than White respondents. Hispanic respondents were also less likely to use marijuana (30-33%), but not hard drugs, than White respondents. Asian Americans only had lower odds of using marijuana than whites when controlling for school (49.3%) and parental support (51.1%), but not religiosity. Finally, Native American or "other" race/ethnicity respondents did not have significantly different odds of using marijuana or hard drugs than White respondents in the last year.

Supplemental Analyses

As previously mentioned, prior substance use is a consistent predictor of future substance use and would likely account for more variance in my dependent variables than poly-victimization or social support. While I would include prior substance use in future iterations of this research, I wanted to examine the influence of adolescent poly-victimization on adult substance use in the absence of prior substance use first. Tables 8-13 in the appendix display logistic regression results for the influence of poly-victimization and social support on marijuana and hard drug use while *controlling for prior substance use*. Model 1 in Tables 8-13 includes key predictor (poly-victimization, social support) and control variables (e.g., substance use) while Model 2 includes interaction terms for each social support variable and poly-victimization.

Again, main effects cannot be interpreted from models with interaction terms, and Model 1 of each appendix table provides the most accurate estimates.

Model 1 in Tables 8 and 11 shows that the effect of poly-victimization and *school support* on marijuana and hard drug use were not statistically significant after controlling for prior substance use. However, folks who had used at least one substance at Wave II were 71% and 65.7% more likely to use marijuana and hard drugs at Wave III, respectively. Model 1 in Tables 9 and 12 display results for poly-victimization and *parental support* after controlling for prior substance use. Poly-victimization was not statistically significant in either model after controlling for prior substance use, while parental support significantly decreased the odds of marijuana use by 23.5% but was not associated with hard drug use. Respondents who had used at least one substance at Wave II were 68.8% and 66.3% more likely to use marijuana or hard drugs at Wave III, respectively. Model 1 in Tables 10 and 13 display results for poly-victimization and *religiosity* after controlling for prior substance use. Again, poly-victimization was not statistically significant in either model, but religiosity significantly decreased the odds of marijuana by 16.7% and hard drug use by 18.4%. Respondents who used at least one substance at Wave II were 74.1% and 67.5% more likely to use marijuana and hard drugs at Wave III, respectively. In sum, the effects of poly-victimization on substance use were not statistically significant when controlling for prior substance use. However, some effects for social support (i.e., parental support on marijuana use, and religiosity on marijuana and hard drug use) persist when controlling for prior substance use.

Discussion

Previous studies have indicated significant associations between adolescent victimization and adolescent substance use, with those experiencing poly-victimization being more likely than single-victims and non-victims to use substances (Afifi et al., 2020; Davis et al., 2018; Farrell & Zimmerman, 2017; Wojciechowski, 2020). However, a dearth of information regarding the relationship between adolescent poly-victimization and *adult* substance use indicates a need for further research on the effects of poly-victimization. Furthermore, while prior research indicates some level of efficacy of social support in reducing deleterious outcomes associated with forms of strain (Cohen & Syme, 1985; Colvin et al, 2002; Cullen, 1994; Huang et al, 2020; Kort-Butler, 2010; Lictitra-Kleckler & Waas, 1993), the influence of social support, as well as its potential moderating effects, has not been widely studied in conjunction with poly-victimization and adult substance use specifically. The current study examined the relationship between poly-victimization and social support during adolescence and substance use during adulthood. I controlled for age, sex, race/ethnicity, and income when estimating the primary models, and included prior substance use in supplemental models.

Consistent with poly-victimization literature, findings from this study suggest that experiencing poly-victimization during adolescence *does* increase the odds of using marijuana and/or hard drugs during adulthood in models that do not control for prior substance use. In models examining the main effects of poly-victimization, folks who experienced *two* types of victimization during adolescence had significantly higher odds (48-65%, varies by social support variable included in the model) of using marijuana or hard drugs compared to those who had not

been victimized. Further, respondents who had experienced *three* types of victimization during adolescence had even higher odds (109-159%) of using marijuana or hard drugs compared to those who had not been victimized. These findings support previous evidence that adolescent poly-victimization is positively associated with illicit substance use, with odds increasing as the number of types of victimization increase (Afifi et al., 2020; Davis et al., 2018; Farrell et al., 2017; Wojciechowski, 2020). Importantly, these findings also advance extant poly-victimization literature by suggesting that the strain resulting from adolescent poly-victimization influences not only adolescent substance use, but also adult substance use.

Findings from the current study also suggest that social support, particularly parental support, school support, and religiosity, is associated with lower odds of using marijuana or hard drugs in adulthood. In models accounting for poly-victimization, school support and religiosity were associated with a 16% and 23% decrease in odds of using marijuana or hard drugs, respectively. Parental support was associated with a 38% decrease in the odds of marijuana use and 22% decrease in the odds of hard drug use. These findings are consistent with the general strain theory framework, which suggests that social support decreases the likelihood of employing antisocial coping mechanisms (Agnew, 1992). The findings are also consistent with a social control approach, which suggests that stronger bonds to individuals (parents, friends, community members) and institutions (schools and churches) will decrease the likelihood of maladaptive behaviors (Hirschi, 1969). However, it is important to note that while social support is associated with lower odds of using substances, there was no evidence that it moderates (i.e., interaction effect) the relationship between adolescent poly-victimization and adult substance use. In other words, these social supports may not reduce the deleterious effects of poly-victimization on substance use.

Findings from this study point to the importance of several possible avenues for mitigating the effects of poly-victimization, the first of which is reducing instances of victimization. Reducing the risk of victimization for adolescents can be done in multiple ways, including schools placing an emphasis on fostering school bonding (Catalano et al., 2004) and implementing school-wide anti-bullying programs (Hay & Meldrum, 2010), as well as the provision of parent management training programs (Hoeve et al., 2009). Catalano and colleagues (2014) suggest that when schools promote school bonding (i.e., are well-organized, facilitate active involvement by students, recognize and reward students for their involvement, and place equal emphasis on social, emotional, and cognitive development), problem behaviors such as substance use, delinquency, and gang involvement are reduced. This could be effective in reducing victimization risk as people who are involved with gangs, substance use, and criminal behavior are more likely to be victimized (CDC, 2020). Further, the implementation of school-wide anti-bullying programs, which inform students, parents, and teachers about the various forms of bullying and their negative effects, effectively reduce victimization by producing a culture of anti-bullying (Hay and Meldrum, 2010). Schools with cultures of bonding and anti-bullying may also provide a form of support for those who *do* experience victimization, potentially reducing displays of maladaptive behavior, which is supported by my findings.

Parent management training programs serve to both reduce the risk of victimization by participants' children, as well as their likelihood of maladaptive behavior (Hoeve et al., 2009; 2011). Since neglectful and hostile parenting is associated with increased deviant behavior by children, parenting programs should focus on teaching authoritative control. This is characterized by the acknowledgement, rewarding, and reinforcement of good behavior, calm conversations about negative behaviors, and allowing children a say in their consequences for good and bad

behavior (Hoeve et al., 2009, p. 763). This parenting style fosters a level of trust that is conducive to increased information sharing, which better equips parents to monitor their children while at home and away. For those who have not been victimized, parental monitoring reduces their risks of ever being victimized, and for those who *have*, parental monitoring reduces their risk of future victimization *and* maladaptive behavior (Hoeve, 2011). While the measures used to create the parental support measure in this study do not perfectly capture all components of authoritative control (e.g., inductive parenting, rewarding and reinforcing positive behavior, and employing nonpunitive techniques), they do suggest that elements of authoritative control are associated with reduced odds of maladaptive behavior in the form of substance use.

Different forms of therapy should also be encouraged for people who have experienced victimization. Hay and Meldrum (2010), for example, suggest that cognitive behavioral therapy (CBT) can reduce deviance by teaching individuals how to identify and alter their maladaptive behaviors in response to negative events like victimization. Further, family-based treatment, such as multi-systemic therapy (MST), functional family therapy (FFT) (Hoeve et al., 2011), and home visiting programs (Reynolds, Chen, & Herbers, 2009) can reduce maladaptive behavior by teaching and reinforcing authoritative parenting, addressing family conflict in a positive manner, and monitoring and discouraging parental maltreatment. Finally, while it is of the utmost importance to respect religious freedom, for families who voluntarily identify as religious, the results of this study suggest that it could be beneficial to encourage involvement in church youth groups and services generally.

The current study is not without limitations. First, using binary measures of past-year substance use might not capture individual-level substance use habits as well as continuous measures of daily, weekly, or monthly substance use. Second, Wave III Add Health data was

collected between 2001-2002. At this time, medical marijuana use had only been legal in some states for five years (first legalized in California in 1996) and recreational use was illegal in all states (first legalized in Colorado and Washington in 2012). With marijuana use increasingly being decriminalized, Wave III Add Health data might not accurately reflect contemporary marijuana use. Finally, while the poly-victimization scale was created in a manner consistent with other poly-victimization studies, there are forms of victimization that are unaccounted for that would be worth exploring in the future, such as physical or psychological parental abuse and sibling violence.

Future iterations of this research could utilize up-to-date and more detailed measures of substance use, such as daily, weekly, or monthly frequency rather than "ever" measures. This would allow for more meaningful estimates of substance use as predicted by poly-victimization. Further, researchers could expand the scope of poly-victimization by including measures of physical and psychological parental abuse and sibling violence. Finally, instead of including attempted suicide as a measure of poly-victimization, scholars could consider testing suicide attempts as a potential mediator in the relationship between poly-victimization and substance use. Since poly-victimization is associated with negative mental health outcomes like anger, anxiety, and depression (Finkelhor et al., 2007; Ford et al., 2010), it could potentially increase suicidal ideation, which in turn, could increase maladaptive behaviors like substance use. Thus, key findings from this study—poly-victims have higher odds of using illicit substances during adulthood and high levels of social support reduce the odds of illicit substance use in adulthood—add to extant poly-victimization literature and provide useful avenues for further research and policy improvement.

References

Afifi, T.O., Taillieu, T., Salmon, S., Davila, I.G., Stewart-Tufescu, A., Fortier, J., & MacMillan, H.L. (2020). Adverse Childhood Experiences (ACEs), Peer Victimization, and Substance Use Among Adolescents. *Child Abuse & Neglect, 106*, 104504.

Agnew, R. (1992). Foundation for a general strain theory of crime and delinquency. *Criminology*, *30*(1), 47-88.

Agnew, R. (1999). A general strain theory of community differences in crime rates. *Journal of research in crime and delinquency*, *36*(2), 123-155.

Agnew, R. (2006). *Pressured into crime: An overview of general strain theory*. Oxford University Press.

Agnew, R. (2013). When criminal coping is likely: An extension of general strain theory. *Deviant Behavior*, *34*(8), 653-670.

Anumba, N., Dematteo, D., & Heilbrun, K. (2012). Social functioning, victimization, and mental health among female offenders. *Criminal Justice and Behavior*, *39*(9), 1204-1218.

Arteaga, I., Chen, C. C., & Reynolds, A. J. (2010). Childhood predictors of adult substance abuse. *Children and Youth Services Review*, *32*(8), 1108-1120.

Avison, W. R., & Turner, R. J. (1988). Stressful life events and depressive symptoms: Disaggregating the effects of acute stressors and chronic strains. *Journal of Health and Social Behavior*, 253-264.

Brezina, T. (2017). General strain theory. In *Oxford Research Encyclopedia of Criminology and Criminal Justice*.

Bujang, M. A., Sa'at, N., Bakar, T. M. I. T. A., & Joo, L. C. (2018). Sample size guidelines for logistic regression from observational studies with large population: emphasis on the accuracy between statistics and parameters based on real life clinical data. *The Malaysian Journal of Medical Sciences: MJMS*, *25*(4), 122.

Carson, EA. (2019). Prisoners in 2019. *Bureau of Justice Statistics.*

Catalano, R. F., Haggerty, K. P., Oesterle, S., Fleming, C. B., & Hawkins, J. D. (2004). The importance of bonding to school for healthy development: Findings from the Social Development Research Group. *Journal of school health*, *74*, 252-261.

Centers for Disease Control and Prevention. (2020). Violence Prevention: Risk and Protective Factors. Centers for Disease Control and Prevention.

Chassin, L., Pitts, S. C., & Prost, J. (2002). Binge drinking trajectories from adolescence to emerging adulthood in a high-risk sample: predictors and substance abuse outcomes. *Journal of consulting and clinical psychology*, *70*(1), 67.

Chassin, L., Flora, D. B., & King, K. M. (2004). Trajectories of alcohol and drug use and dependence from adolescence to adulthood: the effects of familial alcoholism and personality. *Journal of abnormal psychology*, *113*(4), 483.

Cinamon, J. S., Muller, R. T., & Rosenkranz, S. E. (2014). Trauma severity, poly-victimization, and treatment response: adults in an inpatient trauma program. *Journal of Family Violence*, *29*(7), 725-737.

Cohen, S., & Syme, S. L. (1985). Issues in the study and application of social support. *Social support and health*, *3*, 3-22.

Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological bulletin*, *98*(2), 310.

Colvin, M., Cullen, F. T., & Ven, T. V. (2002). Coercion, social support, and crime: An emerging theoretical consensus. *Criminology*, *40*(1), 19-42.

Compas, B. E., Slavin, L. A., Wagner, B. M., & Vannatta, K. (1986). Relationship of life events and social support with psychological dysfunction among adolescents. *Journal of Youth and Adolescence*, *15*(3), 205-221.

Copeland, W. E., Wolke, D., Angold, A., & Costello, E. J. (2013). Adult psychiatric outcomes of bullying and being bullied by peers in childhood and adolescence. *JAMA psychiatry*, *70*(4), 419-426.

Couloute, L., & Kopf, D. (2018). Out of prison & out of work: Unemployment among formerly incarcerated people. *Prison Policy Initiative*.

Cuevas, C. A., Finkelhor, D., Turner, H. A., & Ormrod, R. K. (2007). Juvenile delinquency and victimization: A theoretical typology. *Journal of interpersonal violence*, *22*(12), 1581-1602.

Cullen, F. T. (1994). Social support as an organizing concept for criminology: Presidential address to the Academy of Criminal Justice Sciences. *Justice Quarterly*, *11*(4), 527-559.

Davis, J. P., Dumas, T. M., Berey, B., Merrin, G. J., Tan, K., & Madden, D. R. (2018). Poly-victimization and trajectories of binge drinking from adolescence to young adulthood among serious juvenile offenders. *Drug and alcohol dependence*, *186*, 29-35.

Davis, J. P., Dworkin, E. R., Helton, J., Prindle, J., Patel, S., Dumas, T. M., & Miller, S. (2019). Extending poly-victimization theory: Differential effects of adolescents' experiences of victimization on substance use disorder diagnoses upon treatment entry. *Child Abuse & Neglect*, *89*, 165-177.

Davis, J. P., Ingram, K. M., Merrin, G. J., & Espelage, D. L. (2020). Exposure to parental and community violence and the relationship to bullying perpetration and victimization among early adolescents: A parallel process growth mixture latent transition analysis. *Scandinavian journal of psychology*, *61*(1), 77-89.

Dawson, D. A. (2000). Alcohol consumption, alcohol dependence, and all-cause mortality. *Alcoholism: Clinical and Experimental Research*, *24*(1), 72-81.

Drakulich, K. M., Crutchfield, R. D., Matsueda, R. L., & Rose, K. (2012). Instability, informal control, and criminogenic situations: Community effects of returning prisoners. *Crime, law and social change*, *57*(5), 493-519.

Duncan, R. D. (1999). Peer and sibling aggression: An investigation of intra-and extra-familial bullying. *Journal of interpersonal violence*, *14*(8), 871-886.

DuRant, R. H., Altman, D., Wolfson, M., Barkin, S., Kreiter, S., & Krowchuk, D. (2000). Exposure to violence and victimization, depression, substance use, and the use of violence by young adolescents. *The Journal of Pediatrics*, *137*(5), 707-713.

Farrell, C., & Zimmerman, G. M. (2017). Does offending intensify as exposure to violence aggregates? Reconsidering the effects of repeat victimization, types of exposure to violence, and poly-victimization on property crime, violent offending, and substance use. *Journal of Criminal Justice*, *53*, 25-33.

FBI. (2019). *Table 29*. FBI. Retrieved October 2, 2021, from https://ucr.fbi.gov/crime-in-the-u.s/2019/crime-in-the-u.s.-2019/topic-pages/tables/table-29

Finkelhor, D., Turner, H., & Ormrod, R. (2006). Kid's stuff: The nature and impact of peer and sibling violence on younger and older children. *Child abuse & neglect*, *30*(12), 1401-1421.

Finkelhor, D., Ormrod, R. K., & Turner, H. A. (2007). Poly-victimization: A neglected component in child victimization. *Child abuse & neglect*, *31*(1), 7-26.

Finkelhor, D., Turner, H. A., Shattuck, A., & Hamby, S. L. (2015). Prevalence of childhood exposure to violence, crime, and abuse: Results from the national survey of children's exposure to violence. *JAMA pediatrics*, *169*(8), 746-754.

Folger, R. (1986). Rethinking equity theory. In *Justice in social relations* (pp. 145-162). Springer, Boston, MA.

Ford, J. A., & Schroeder, R. D. (2009). Academic strain and non-medical use of prescription stimulants among college students. *Deviant Behavior*, *30*(1), 26-53.

Ford, J. A. (2014). Poor health, strain, and substance use. *Deviant Behavior*, *35*(8), 654-667.

Ford, J. D., & Delker, B. C. (2018). Polyvictimization in childhood and its adverse impacts across the lifespan: Introduction to the special issue. *Journal of Trauma & Dissociation*, *19*(3), 275-288.

Ford, J. D., Elhai, J. D., Connor, D. F., & Frueh, B. C. (2010). Poly-victimization and risk of posttraumatic, depressive, and substance use disorders and involvement in delinquency in a national sample of adolescents. *Journal of Adolescent Health*, *46*(6), 545-552.

Friedrich, W., Reams, R., & Jacobs, J. (1982). Depression and suicidal ideation in early adolescents. *Journal of youth and adolescence*, *11*(5), 403-407.

Gellert, P., Häusler, A., Suhr, R., Gholami, M., Rapp, M., Kuhlmey, A., & Nordheim, J. (2018). Testing the stress-buffering hypothesis of social support in couples coping with early-stage dementia. *PloS one*, *13*(1).

Hasselle, A. J., Howell, K. H., Dormois, M., & Miller-Graff, L. E. (2017). The influence of childhood polyvictimization on disordered eating symptoms in emerging adulthood. *Child abuse & neglect*, *68*, 55-64.

Hay, C., & Meldrum, R. (2010). Bullying victimization and adolescent self-harm: Testing hypotheses from general strain theory. *Journal of youth and adolescence*, *39*(5), 446-459.

Hegtvedt, K. A. (1990). The effects of relationship structure on emotional responses to inequity. *Social Psychology Quarterly*, 214-228.

Higgins, D. J., & McCabe, M. P. (2000). Relationships between different types of maltreatment during childhood and adjustment in adulthood. *Child maltreatment*, *5*(3), 261-272.

Hirschi, T. (1969). *Causes of Delinquency*. Berkeley: University of California Press.

Hoeve, M., Dubas, J. S., Eichelsheim, V. I., Van der Laan, P. H., Smeenk, W., & Gerris, J. R. (2009). The relationship between parenting and delinquency: A meta-analysis. *Journal of abnormal child psychology*, *37*(6), 749-775.

Hoeve, M., Dubas, J. S., Gerris, J. R., van der Laan, P. H., & Smeenk, W. (2011). Maternal and paternal parenting styles: Unique and combined links to adolescent and early adult delinquency. Journal of adolescence, 34(5), 813-827.

Hoffman, J. P., & Su, S. S. (1997). The conditional effects of stress on delinquency and drug use: A strain theory assessment of sex differences. Journal of Research in Crime and Delinquency, 34, 46-78.

Huang, Y., Edwards, J., & Laurel-Wilson, M. (2020). The shadow of context: Neighborhood and school socioeconomic disadvantage, perceived social integration, and the mental and behavioral health of adolescents. *Health & Place*, *66*, 102425.

Hullenaar, K., & Ruback, R.B. (2020). Juvenile Violent Victimization, 1995-2018. *Office of Juvenile Justice and Delinquency Prevention.*

Iacobucci, D., Schneider, M. J., Popovich, D. L., & Bakamitsos, G. A. (2016). Mean centering helps alleviate "micro" but not "macro" multicollinearity. *Behavior Research Methods*, *48*(4), 1308-1317.

Källström, Å., Hellfeldt, K., Howell, K. H., Miller-Graff, L. E., & Graham-Bermann, S. A. (2020). Young adults victimized as children or adolescents: Relationships between perpetrator patterns, poly-victimization, and mental health problems. *Journal of interpersonal violence*, *35*(11-12), 2335-2357.

Kilpatrick, D. G., Acierno, R., Saunders, B., Resnick, H. S., Best, C. L., & Schnurr, P. P. (2000). Risk factors for adolescent substance abuse and dependence: data from a national sample. *Journal of consulting and clinical psychology*, *68*(1), 19.

Kirst, M., Mecredy, G., Borland, T., & Chaiton, M. (2014). Predictors of substance use among young adults transitioning away from high school: A narrative review. *Substance use & misuse*, *49*(13), 1795-1807.

Kort-Butler, L. A. (2010). Experienced and vicarious victimization: Do social support and self-esteem prevent delinquent responses?. *Journal of Criminal Justice*, *38*(4), 496-505.

Kubrin, C. E., Stucky, T.D., Krohn, M.D. (2009). Researching theories of crime and deviance. New York: Oxford University Press.

Lee, C. T., McClernon, F. J., Kollins, S. H., Prybol, K., & Fuemmeler, B. F. (2013). Childhood economic strains in predicting substance use in emerging adulthood: Mediation effects of youth self-control and parenting practices. *Journal of pediatric psychology*, *38*(10), 1130-1143.

Licitra-Kleckler, D. M., & Waas, G. A. (1993). Perceived social support among high-stress adolescents: The role of peers and family. *Journal of Adolescent Research*, *8*(4), 381-402.

Lin, N., & Dumin, M. (1986). Access to occupations through social ties. *Social networks*, *8*(4), 365-385.

Loeber, R., & Stouthamer-Loeber, M. (1986). Family factors as correlates and predictors of juvenile conduct problems and delinquency. *Crime and justice*, *7*, 29-149.

Merline, A. C., O'Malley, P. M., Schulenberg, J. E., Bachman, J. G., & Johnston, L. D. (2004). Substance use among adults 35 years of age: prevalence, adulthood predictors, and impact of adolescent substance use. *American journal of public health*, *94*(1), 96-102.

Merton, R. K. (1938). Social Structure and Anomie. *American Sociological Review*, 3:5, 672-682.

Merton, R. K., & Merton, R. C. (1968). *Social theory and social structure*. Simon and Schuster.

Mitchell, K. J., Moschella, E. A., Hamby, S., & Banyard, V. (2020). Developmental stage of onset, poly-victimization, and persistence of childhood victimization: Impact on adult well-being in a rural community–based study. *Child maltreatment*, *25*(1), 20-31.

Moss, H. B., Chen, C. M., & Yi, H. Y. (2014). Early adolescent patterns of alcohol, cigarettes, and marijuana polysubstance use and young adult substance use outcomes in a nationally representative sample. *Drug and alcohol dependence*, *136*, 51-62.

Mulla, M. M., Bogen, K. W., & Orchowski, L. M. (2020). The mediating role of school connectedness in the associations between dating and sexual violence victimization and substance use among high school students. *Preventive medicine*, *139*, 106197.

Nagin, D., & Paternoster, R. (2000). Population heterogeneity and state dependence: State of the evidence and directions for future research. *Journal of Quantitative Criminology*, *16*(2), 117-144.

Nelson, S. E., Van Ryzin, M. J., & Dishion, T. J. (2015). Alcohol, marijuana, and tobacco use trajectories from age 12 to 24 years: Demographic correlates and young adult substance use problems. *Development and psychopathology*, *27*(1), 253-277.

O'Brien, R. M. (2007). A caution regarding rules of thumb for variance inflation factors. *Quality & quantity*, *41*(5), 673-690.

Pager, D. (2003). The mark of a criminal record. *American journal of sociology*, *108*(5), 937-975.

Pearlin, L. I., Menaghan, E. G., Lieberman, M. A., & Mullan, J. T. (1981). The stress process. *Journal of Health and Social Behavior*, *22*(4), 337–356.

Petraitis, J., Flay, B. R., Miller, T. Q., Torpy, E. J., & Greiner, B. (1998). Illicit substance use among adolescents: A matrix of prospective predictors. *Substance Use & Misuse*, *33*(13), 2561-2604.

Rapsey, C. M., Scott, K. M., & Patterson, T. (2019). Childhood sexual abuse, poly-victimization and internalizing disorders across adulthood and older age: Findings from a 25-year longitudinal study. *Journal of affective disorders*, *244*, 171-179.

Reynolds, A. J., Chen, C. C., & Herbers, J. E. (2009, June). School mobility and educational success: A research synthesis and evidence on prevention. In *Workshop on the impact of mobility and change on the lives of young children, schools, and neighborhoods, June* (pp. 29-30).

Robbers, M. L. (2004). Revisiting the moderating effect of social support on strain: A gendered test. *Sociological Inquiry*, *74*(4), 546-569.

Root, M. P., & Fallon, P. (1988). The incidence of victimization experiences in a bulimic sample. *Journal of Interpersonal Violence*, *3*(2), 161-173.

Rose, C. A., Espelage, D. L., Aragon, S. R., & Elliott, J. (2011). Bullying and victimization among students in special education and general education curricula. *Exceptionality Education International*, *21*(3).

Segura, A., Pereda, N., Guilera, G., & Abad, J. (2016). Poly-victimization and psychopathology among Spanish adolescents in residential care. *Child abuse & neglect*, *55*, 40-51.

Soler, L., Kirchner, T., Paretilla, C., & Forns, M. (2013). Impact of poly-victimization on mental health: The mediator and/or moderator role of self-esteem. *Journal of interpersonal violence*, *28*(13), 2695-2712.

Stadler, C., Feifel, J., Rohrmann, S., Vermeiren, R., & Poustka, F. (2010). Peer-victimization and mental health problems in adolescents: are parental and school support protective?. *Child Psychiatry & Human Development*, *41*(4), 371-386.

Stogner, J., & Gibson, C. L. (2011). The influence of health strain on the initiation and frequency of substance use in a national sample of adolescents. *Journal of Drug Issues*, *41*(1), 69-93.

Substance Abuse and Mental Health Services Administration. (2020). Key substance use and mental health indicators in the United States: Results from the 2019 National Survey on Drug Use and Health. Rockville, MD: Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration.

Thoits, P. A. (1982). Life stress, social support, and psychological vulnerability: Epidemiological considerations. *Journal of Community Psychology*, *10*(4), 341-362.

Tripodi, S. J., & Pettus-Davis, C. (2013). Histories of childhood victimization and subsequent mental health problems, substance use, and sexual victimization for a sample of incarcerated women in the US. *International journal of law and psychiatry*, *36*(1), 30-40.

Tyler, K. A., & Melander, L. A. (2015). Child abuse, street victimization, and substance use among homeless young adults. *Youth & Society*, *47*(4), 502-519.

Van Berkel, S. R., Tucker, C. J., & Finkelhor, D. (2018). The combination of sibling victimization and parental child maltreatment on mental health problems and delinquency. *Child maltreatment*, *23*(3), 244-253.

Vannucci, A., Fagle, T. R., Simpson, E. G., & Ohannessian, C. M. (2021). Perceived family and friend support moderate pathways from peer victimization to substance use in early-adolescent girls and boys: A moderated-mediation analysis. *The Journal of Early Adolescence*, *41*(1), 128-166.

Vaux, A. (1988). *Social support: Theory, research, and intervention*. Praeger publishers.

Wemmers, J. A., Cyr, K., Chamberland, C., Lessard, G., Collin-Vézina, D., & Clement, M. E. (2017). From victimization to criminalization: General strain theory and the relationship between poly-victimization and delinquency. *Victims & Offenders*, *13*(4), 542-557.

Widom, C. S., Ireland, T., & Glynn, P. J. (1995). Alcohol abuse in abused and neglected children followed-up: are they at increased risk?. *Journal of studies on alcohol*, *56*(2), 207-217.

Windle, M. (1992). Temperament and social support in adolescence: Interrelations with depressive symptoms and delinquent behaviors. *Journal of youth and adolescence*, *21*(1), 1-21.

Wojciechowski, T. W. (2020). Early life poly-victimization and differential development of anxiety as risk factors for the continuity of substance dependence in adulthood. *Substance Use & Misuse*, *55*(8), 1347-1355.

Zatti, C., Rosa, V., Barros, A., Valdivia, L., Calegaro, V.C., Freitas, L.H., Mendes Cereser, K.M., Sica daRocha, N., Goettems Bastos, A. & Schuch, F. B. (2017). Childhood trauma and suicide attempt: A meta-analysis of longitudinal studies from the last decade. *Psychiatry research*, *256*, 353-358.

Zinzow, H. M., Ruggiero, K. J., Resnick, H., Hanson, R., Smith, D., Saunders, B., & Kilpatrick, D. (2009). Prevalence and mental health correlates of witnessed parental and community violence in a national sample of adolescents. *Journal of child Psychology and psychiatry*, *50*(4), 441-450.

Appendix A: Supplemental Logical Regression Models

Table 8: Supplemental Logistic Regression results for Marijuana (School Support)

	Model 1	Model 2
Poly-victimization	---	0.997 (0.053)[a]
1 Poly-Vic.	1.115 (0.124)	---
2 Poly-Vic.	0.986 (0.165)	---
3 Poly-Vic.	1.205 (0.265)	---
4 Poly-Vic.	0.535 (0.251)	---
School Support	0.924 (0.060)	0.926 (0.060) [a]
Prior Substance Use	1.710*** (0.061)	1.714*** (0.061)
Age	0.809*** (0.021)	0.810*** (0.021)
Black	0.819 (0.092)	0.821 (0.092)
Hispanic	0.673** (0.101)	0.680** (0.102)
Native Am.	0.855 (0.209)	0.852 (0.210)
Asian Am.	0.544* (0.137)	0.548* (0.137)
Other	0.981 (0.402)	0.978 (0.402)
Male	1.707*** (0.143)	1.711*** (0.143)
Income (thousands)	1.002* (0.001)	1.002* (0.001)
Poly-vic* School Support	---	0.992 (0.071) [a]
Constant	0.232*** (0.066)	0.172*** (0.018)
N	3025	3025
Pseudo R^2	0.10	0.10
Wald χ^2	328.8	322.8

Odds Ratios (OR) presented; Robust standard errors in parentheses. Zero (0) is the reference category for poly-victimization; Non-Hispanic white race is the reference category; * p <.05; ** p < .01; *** p<.001

[a] : Centered version of variable used in Model 4

Table 9: Supplemental Logistic Regression results for Marijuana (Moderator: Parental Support)

	Model 1	Model 2
Poly-victimization	---	1.005 (0.0521) [a]
1 Poly-Vic.	1.101 (0.122)	---
2 Poly-Vic.	0.971 (0.163)	---
3 Poly-Vic.	1.196 (0.265)	---
4 Poly-Vic.	0.523 (0.245)	---
Parental Support	0.765** (0.065)	0.751*** (0.064) [a]
Prior Substance Use	1.688*** (0.061)	1.693*** (0.061)
Age	0.804*** (0.021)	0.804*** (0.021)
Black	0.841 (0.094)	0.841 (0.094)
Hispanic	0.688* (0.103)	0.692* (0.103)
Native Am.	0.868 (0.212)	0.858 (0.211)
Asian Am.	0.529* (0.133)	0.530* (0.132)
Other	0.984 (0.405)	0.965 (0.403)
Male	1.736*** (0.146)	1.739*** (0.146)
Income (thousands)	1.002* (0.001)	1.002* (0.001)
Poly-vic* Parental Support	---	1.108 (0.098) [a]
Constant	0.508 (0.184)	0.174*** (0.018)
N	3025	3025
Pseudo R^2	0.10	0.10
Wald χ^2	328.5	327.1

Odds Ratios (OR) presented; Robust standard errors in parentheses. Zero (0) is the reference category for poly-victimization; Non-Hispanic white race is the reference category; * p <.05; ** p < .01; *** p<.001

[a] : Centered version of variable used in Model 4

Table 10: Supplemental Logistic Regression results for Marijuana (Moderator: Religiosity)

	Model 1	Model 2
Poly-victimization	---	1.002 (0.057) [a]
1 Poly-Vic.	1.247 (0.150)	---
2 Poly-Vic.	0.981 (0.178)	---
3 Poly-Vic.	1.287 (0.320)	---
4 Poly-Vic.	0.367 (0.208)	---
Religiosity	0.833*** (0.046)	0.831*** (0.045) [a]
Prior Substance Use	1.741*** (0.0695)	1.747*** (0.070)
Age	0.811*** (0.023)	0.813*** (0.023)
Black	0.944 (0.113)	0.946 (0.114)
Hispanic	0.708* (0.111)	0.721* (0.113)
Native Am.	0.899 (0.249)	0.889 (0.253)
Asian Am.	0.624 (0.166)	0.631 (0.167)
Other	0.817 (0.374)	0.799 (0.378)
Male	1.656*** (0.151)	1.661*** (0.151)
Income (thousands)	1.002* (0.001)	1.002* (0.001)
Poly-vic* Religiosity	---	1.008 (0.062) [a]
Constant	0.264*** (0.051)	0.162*** (0.018)
N	2607	2607
Pseudo R^2	0.11	0.10
Wald χ^2	302.7	291.8

Odds Ratios (OR) presented; Robust standard errors in parentheses. Zero (0) is the reference category for poly-victimization; Non-Hispanic white race is the reference category; * p <.05; ** p < .01; *** p<.001

[a] : Centered version of variable used in Model 4

Table 11: Supplemental Logistic Regression results for Hard Drugs (Moderator: School Support)

	Model 1	Model 2
Poly-victimization	---	1.063 (0.077) [a]
1 Poly-Vic.	1.016 (0.159)	---
2 Poly-Vic.	0.963 (0.229)	---
3 Poly-Vic.	1.395 (0.364)	---
4 Poly-Vic.	0.548 (0.368)	---
School Support	0.945 (0.087)	0.926 (0.085) [a]
Prior Substance Use	1.657*** (0.076)	1.656*** (0.075)
Age	0.783*** (0.030)	0.783*** (0.030)
Black	0.334*** (0.072)	0.331*** (0.071)
Hispanic	0.805 (0.157)	0.794 (0.154)
Native Am.	1.025 (0.340)	1.000 (0.330)
Asian Am.	0.744 (0.252)	0.750 (0.250)
Other	0.964 (0.529)	1.000 (0.544)
Male	1.679*** (0.195)	1.684*** (0.195)
Income (thousands)	1.002** (0.001)	1.002** (0.001)
Poly-vic* School Support	---	1.187 (0.116) [a]
Constant	0.058*** (0.023)	0.048*** (0.007)
N	3026	3026
Pseudo R^2	0.11	0.11
Wald χ^2	217.8	219.9

Odds Ratios (OR) presented; Robust standard errors in parentheses. Zero (0) is the reference category for poly-victimization; Non-Hispanic white race is the reference category; * p <.05; ** p < .01; *** p<.001

[a] : Centered version of variable used in Model 4

Table 12: Supplemental Logistic Regression results for Hard Drugs (Moderator: Parental Support)

	Model 1	Model 2
Poly-victimization	---	1.041 (0.072) [a]
1 Poly-Vic.	1.026 (0.159)	---
2 Poly-Vic.	0.978 (0.230)	---
3 Poly-Vic.	1.424 (0.369)	---
4 Poly-Vic.	0.569 (0.377)	---
Parental Support	1.011 (0.122)	0.983 (0.119) [a]
Prior Substance Use	1.663*** (0.078)	1.662*** (0.077)
Age	0.783*** (0.030)	0.783*** (0.030)
Black	0.334*** (0.072)	0.332*** (0.072)
Hispanic	0.804 (0.157)	0.800 (0.157)
Native Am.	1.027 (0.340)	0.997 (0.329)
Asian Am.	0.747 (0.253)	0.763 (0.252)
Other	0.962 (0.526)	0.920 (0.536)
Male	1.685*** (0.196)	1.688*** (0.196)
Income (thousands)	1.002** (0.001)	1.002** (0.001)
Poly-vic* Parental Support	---	1.126 (0.135) [a]
Constant	0.044*** (0.023)	0.047*** (0.007)
N	3026	3026
Pseudo R^2	0.11	0.11
Wald χ^2	217.7	213.3

Odds Ratios (OR) presented; Robust standard errors in parentheses. Zero (0) is the reference category for poly-victimization; Non-Hispanic white race is the reference category; * p <.05; ** p < .01; *** p<.001

[a] : Centered version of variable used in Model 4

Table 13: Supplemental Logistic Regression results for Hard Drugs (Moderator: Religiosity)

	Model 1	Model 2
Poly-victimization	---	1.079 (0.079) [a]
1 Poly-Vic.	1.201 (0.202)	---
2 Poly-Vic.	1.111 (0.281)	---
3 Poly-Vic.	1.380 (0.403)	---
4 Poly-Vic.	0.652 (0.460)	---
Religiosity	0.816** (0.063)	0.808** (0.062) [a]
Prior Substance Use	1.675*** (0.083)	1.677*** (0.083)
Age	0.768*** (0.033)	0.769*** (0.033)
Black	0.358*** (0.083)	0.351*** (0.082)
Hispanic	0.836 (0.171)	0.852 (0.173)
Native Am.	1.121 (0.422)	1.079 (0.414)
Asian Am.	0.772 (0.289)	0.769 (0.288)
Other	0.636 (0.470)	0.579 (0.471)
Male	1.627*** (0.205)	1.634*** (0.207)
Income (thousands)	1.002** (0.001)	1.002** (0.001)
Poly-vic* Religiosity	---	1.111 (0.091) [a]
Constant	0.076*** (0.020)	0.045*** (0.007)
N	2608	2608
Pseudo R^2	0.12	0.12
Wald χ^2	207.0	200.3

Odds Ratios (OR) presented; Robust standard errors in parentheses. Zero (0) is the reference category for poly-victimization; Non-Hispanic white race is the reference category; * p <.05; ** p < .01; *** p<.001

[a] : Centered version of variable used in Model 4