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Longitudinal Effects of Peer, School, and Parenting Contexts on Substance Use Initiation in Middle School Adolescence

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LONGITUDINAL EFFECTS OF PEER, SCHOOL, AND PARENTING CONTEXTS ON SUBSTANCE USE INITIATION IN MIDDLE ADOLESCENCE

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by

Barry Ladis

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To: Dean Tomás R. Guilarte
Robert Stempel College of Public Health & Social Work

This dissertation, written by Barry Ladis, and entitled Longitudinal Effects of Peer, School, and Parenting Contexts on Substance Use Initiation in Middle Adolescence, having been approved in respect to style and intellectual content, is referred to you for judgment.

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DEDICATION

I dedicate this dissertation to my wife, Karen, and my four children Ilana, Matthew, Kayla, and Ross for their patience, understanding, support, and most of all, love. I also dedicate this dissertation to Teresita Callero, my therapist at South Miami Hospital's Addiction Treatment Program, who loved me when I could not love myself, and encouraged me to seek a new career as a social worker. Last, I dedicate this dissertation to my higher power, which I choose to call G-d, for putting my sponsor, sponsees, and the fellowship of Alcoholics Anonymous in my life to help me remain sober one day at a time. Without continued sobriety, the support of my family, and the host of friends I made in Alcoholics Anonymous, the completion of this work would not have been possible.

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ABSTRACT OF THE DISSERTATION

LONGITUDINAL EFFECTS OF PEER, SCHOOL, AND PARENTING CONTEXTS ON SUBSTANCE USE INITIATION IN MIDDLE ADOLESCENCE

by

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Florida International University, 2018

Miami, Florida

Professor Barbara Thomlison, Major Professor

Substance use initiation (SUI) among adolescents is a critical public health concern. Research indicates SUI in middle adolescence increases the risk of substance use in adulthood and later dependence, which can result in deleterious consequences for youth, family relationships, and community (Substance Abuse and Mental Health Services Administration, [SAMSHA], 2014). This study investigated the role of involvement with deviant peers, school connectedness, and parenting quality on SUI (e.g., alcohol, cigarettes, and marijuana) in middle adolescence using secondary data from a 5-year longitudinal study ($N = 387$). First, exploratory factor analyses and confirmatory factor analyses with a separate independent sample were conducted to develop a measure of parenting quality. Second, moderated mediation was tested using PROCESS (Hayes, 2013) with each parenting quality factor as a moderator of two mediation pathways (involvement with deviant peers and school connectedness) on three SUI outcomes. Results from the exploratory factor and confirmatory factor analyses were consistent and provided evidence for a three-factor solution for parenting quality: Parental Knowledge and Affective Relationships, Parental Control, and Parental Communication and

Involvement. Results from the moderated mediation analyses did not support parenting quality factors as moderators for either mediation model. Involvement with deviant peers (Wave 3) mediated the relation between school connectedness (Wave 2) and each of the three substances (Wave 5) across all levels of parenting quality (e.g., bias-corrected bootstrap confidence intervals = -.50 – -.18 at low, -.47 – -.19 at average, and -.50 – -.16 at high levels of Parental Knowledge and Affective Relationships for alcohol use initiation). More specifically, low school connectedness predicted higher involvement with deviant peers, which, in turn, predicted a higher likelihood of SUI. School connectedness was not a significant mediator in the relationship between involvement with deviant peers and SUI. Although parenting quality factors did not moderate either of the mediation pathways, development of a comprehensive and psychometrically valid measure may aid in identifying specific parenting problem areas necessary for preventive intervention planning. Additionally, supporting adolescents who lack strong connections within the school may help prevent involvement with deviant peers and SUI.

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ABBREVIATIONS AND ACRONYMS

AUI	Alcohol use initiation
CUI	Cigarette use initiation
CFI	Confirmatory factor analysis
EFA	Exploratory factor analysis
MTF	Monitoring the Future
MUI	Marijuana use initiation
PC	Parental Control
PCI	Parental Communication and Involvement
PD	Involvement with deviant peers
PKAR	Parental Knowledge and Affective Relationships
SC	School connectedness
SPSS	Statistical Package for Social Science
SU	Substance use
SUI	Substance use initiation
W_2	Wave two
W_3	Wave three
W_4	Wave four
W_5	Wave five

I. INTRODUCTION

Longitudinal Effects of Peer, School, and Parenting Contexts on Substance Use Initiation in Middle Adolescence

Problem Statement

Substance use initiation (SUI) in middle to late adolescence (15-17 years) is a critical public health concern. One reason for this concern is the high prevalence rates of substance use (SU), as SUI often starts among a small percentage of youth during early adolescence (12-13 years) and peaks throughout later adolescence (Degenhardt, Stockings, Patton, Hall, & Lynskey, 2016). Recent results from the Monitoring the Future (MTF) study found that among eighth graders, 8% reported use of alcohol in the past month, 16% use of marijuana in the past-12 months, and 3.1% use of cigarettes in the past month. For 10th graders, results were 20% for alcohol, 22% for marijuana, and 6.1% for cigarettes. For 12th graders, 33% reported the past-month use of alcohol, with an alarming 17% of high-school seniors binge drinking (i.e., having at least five alcoholic beverages consecutively on one or more instances in the preceding 14 days). Furthermore, one out of 17 (6%) 12th graders reported smoking marijuana daily. Regarding cigarettes, 11.1% of 12th graders reported smoking cigarettes in the last 30 days (Johnston, Miech, O'Malley, Bachman, Schulenberg, & Patrick, 2018).

These high prevalence rates are concerning since SUI before age 15 significantly increases the risk of substance use disorders (SUDs; U.S. Department of Health and Human Services (HHS), Office of the Surgeon General, November 2016). SUDs can have a negative impact on youth, family, and communities (Hawkins et al., 2016). Indeed, SUDs are linked to leading causes of mortality and morbidity among youth,

including strokes and cancer in adulthood, mental illness, and suicide (Becker, 2013; Merline, O'malley, Schulenberg, Bachman, & Johnston, 2004; National Institute on Drug Abuse [NIDA], 2017).

Research suggests that experiences within the parenting context can impact adolescent SUI (Martineau, Tyner, Lorenc, Petticrew, & Lock, 2013; Stockings et al., 2016). Because of the significant public health concerns resulting from SUI, improving parent assessment practices may help prevent and reduce adolescent SU. Prevention research identifies parenting as one of the most malleable contexts that can be altered through skill-based interventions focused on positive youth development (Allen, Garcia-Huidobro, & Porta, 2016; Van Ryzin, Kumpfer, Fosco, & Greenberg, 2015). Parenting represents a broad range of practices, skills, and attitudes that are critical for preventing adolescent SU (Martineau et al., 2013; Stockings et al., 2016). Although the literature supports parenting as a complex and multidimensional construct, few assessment measures exist that capture the many transactional aspects of parenting with good reliability (Lindhiem & Shaffer, 2017; Smith, 2011). For example, current general parenting measures often exclude key constructs such as parental monitoring and reactions towards substance-use specific behavior. A comprehensive and psychometrically sound measure of overall parenting would assist researchers and clinicians in determining which dimensions of parenting quality may have the most impact on prevention and treatment efforts for adolescent SUI.

Theoretical Framework

Ecological models, those that consider multiple levels of influence, can advance understanding of the different contextual influences that contribute to the etiology of

adolescent SUI (Coatsworth, Maldonado-Molina, Pantin, & Szapocznik, 2005). Bronfenbrenner's ecological model of human development (1979; Figure 1) posits that youth's environmental contexts affect their development. The theory incorporates four levels of a youth's environment: (1) the microsystem, (2) the mesosystem, (3) the exosystem, and (4) the macrosystem (Bronfenbrenner, 1979). Each of these levels, some proximal and others distal, have a dynamic influence on each other. At each of these levels, and between levels, risk and protective factors interact to impact development (Bronfenbrenner, 1979; Bronfenbrenner & Morris, 2007).

The microsystem refers to activities, roles, and interpersonal relationships within the youth's immediate environmental context, such as peers, school, and parents (Richman, Bowen, & Wooley, 2004; Ungar, Ghazinour, & Richter, 2013). The mesosystem is comprised of the interaction between two or more microsystems, such as the relationships between an adolescent and either their parents, peers, or teachers. Youth do not directly participate in the exosystem. However, events in the exosystem can influence situations and circumstances in the microsystem, indirectly influencing child development (Bronfenbrenner, 1979). To illustrate, a change in a parent's workplace, requiring them to work longer hours, may result in less time for involvement and communication with their child(ren). A strain on these two parenting practices can negatively impact child development. Last, the macrosystem includes patterns of culture or subculture such as economic, social, educational, and political systems (Bronfenbrenner, 1979).

The overarching framework for this study focused on the microsystem and the mesosystem, as these levels have more of a direct effect on adolescent behavior

(Bronfenbrenner, 1979; Bronfenbrenner & Morris, 2007). Limited longitudinal research is available that explains the complex contextual and reciprocal effects of different microsystems on adolescent SUI, including the unique contributions of each context (Dever, Schulenberg, Dworkin, O'Malley, Kloska, & Bachman, 2012; Mason et al., 2016). Accordingly, this study focused on three crucial aspects of an adolescent's social ecology—peers, school(s), parent(s)—and their joint influence in predicting adolescent SUI. Alcohol, tobacco, and marijuana use initiation(s) are selected as the outcome variables for this study as they are the most common substances initiated by adolescents (Thrash & Warner, 2016).

II. LITERATURE REVIEW

Peer Influences

Peer influences are one of the micro level contexts that have a significant impact on adolescent SUI (Urberg, Değirmencioğlu, & Pilgrim, 1997; Musher-Eizenman, Holub, & Arnett, 2003; Zimmerman & Farrell, 2016). As adolescents grow older and seek more autonomy, peers have a strong effect on their social development, which often becomes more predictive of SUI than parental influence (Atherton, Conger, Ferrer, & Robins, 2015; Van Ryzin, Fosco, & Dishion, 2012). Social learning theory (Bandura, 1977) suggests that adolescents learn to imitate and receive social reinforcement for choices about SUI through affiliation with peers (Petraitis, Flay, & Miller, 1995). Some studies identify relationships with prosocial, non-substance using peers as protective against SUI (Fabes, Hanish, Martin, Moss, & Reesing, 2012; Kim, Oesterle, Catalano, & Hawkins, 2015; McDonough, Jose, & Stuart, 2016).

Conversely, research highlights that affiliation with deviant peers is the most powerful predictor of adolescent SUI (Fagan, Wright, & Pinchevsky, 2015; Leifheit et al., 2015). Deviant peer influences on SUI have been examined through a peer socialization pathway (Burk, Van Der Vorst, Kerr, & Stattin, 2012). This pathway, typically relevant in early adolescence (Trucco, Colder, & Wieczorek, 2011), focuses on how overt pressure from or association with deviant peers, who have favorable substance using attitudes, beliefs, and other delinquent behaviors, increases the risk of SUI (Beckmeyer & Weybright, 2016; Gazis, Connor, & Ho, 2009; Hawkins, Catalano, & Miller, 1992; Sale, Sambrano, Springer, & Turner, 2003; Zimmerman & Farrell, 2016). As this study is focused on middle adolescence, the peer socialization pathway is the most relevant theoretical perspective that informs the association between deviant peer influences on later SUI.

School Influences

Schools are an important context to consider regarding adolescent SUI (Henry & Slater, 2007; Henry, Stanley, Edwards, Harkabus, & Chapin, 2009). Factors such as the amount of time spent in the school, school transitions (Jackson & Schulenberg, 2013), and school connectedness expose adolescents to both positive and negative influences from new educational settings, peers, and teachers (Kim et al., 2015; Rovis, Jonkman, & Basic, 2016; Vogel, Rees, McCuddy, & Carson, 2015). School connectedness is a multi-faceted construct characterized by an adolescents' positive perception of the school environment, close affective relationships with peers and teachers, and a commitment to doing well in school (Bond et al., 2007; Catalano, Oesterle, Fleming, & Hawkins, 2004; Vogel et al., 2015).

School connectedness' influence on SUI is informed by attachment theory (Bowlby, 1988), social control theory (Hirschi, 1969), and the social development model (Catalano & Hawkins, 1996), all of which posit the role of strong bonds with educational institutions and the prosocial values that they represent as being protective against SUI (Azagba & Asbridge, 2013; Chassin, Flora, & King, 2004; Crosnoe, Erickson, & Dornbusch, 2002; Monahan, Oesterle, & Hawkins, 2010). Studies indicate that adolescents are less at risk of SUI when they perceive that their teachers are fair and caring (McNeely & Falci, 2004; Perra, Fletcher, Bonell, Higgins, & McCrystal, 2012), have close relationships with prosocial peers at school (Henry et al., 2009; Vogel et al., 2015), and are invested in learning (Bond et al., 2007; Fletcher, Bonell, & Hargreaves, 2008; Rovis et al., 2016; West, Sweeting, & Leyland, 2004). Studies have also found that students with a high level of school connectedness are more likely to attend school regularly and achieve better academic results, both of which protect against SUI (Archambault, Janosz, Fallu, & Pagani, 2009; Bonell et al., 2013; Chapman, Buckley, Sheehan & Shochet, 2013).

Involvement with Deviant Peers and School Connectedness as Mediators

Prior research, using separate models, has focused primarily on the direct link between peer and school contexts and adolescent SUI. However, few studies have used longitudinal data to examine the causal relationship between involvement with deviant peers, school connectedness, and SUI. It is important to examine both social contexts since they are both relevant in shaping adolescent behavior (Li, Li, Wang, Zhao, Bao, & Wen, 2013). Schools provide access to different types of peer groups who may not be available through neighborhood or family networks. Moreover, the significant amount of

time spent in school settings during adolescence makes this context especially relevant for understanding peer socialization (Vogel et al., 2015). While it is likely that both social contexts impact SUI, conceptually there may be two etiological pathways to SUI. It is not clear if low levels of school connectedness lead to increased deviant peer affiliation, or whether affiliating with deviant peer groups leads to less school connectedness. Answers to these questions are essential to gaining a better understanding of the processes through which these social contexts impact later SUI. Moreover, a greater understanding of the processes will help identify important targets of intervention at particular ages. This work is only possible with longitudinal study designs.

Involvement with deviant peers as a mediator. Bronfenbrenner's (1979) ecological model of human development helps to inform how involvement with deviant peers may mediate the association between school connectedness and adolescent SUI. This model suggests that school connectedness may have a weaker, less proximal influence on the adolescent than the stronger, more proximal influence from peers. Involvement with deviant peers may serve as the gateway to which school connectedness impacts adolescent SUI (Bronfenbrenner & Morris, 2007). Limited research is available on the indirect effects of school connectedness on adolescent SUI via deviant peer affiliation. In two cross-sectional studies, one with Hispanic youth (Chun, Devall, & Sandau-Beckler, 2013) and another with European youth (Su & Supple, 2014), there was support for the role of negative peer influence as a mediator between school connectedness and SU outcomes. In both studies, results indicated that when youth lack a meaningful connection to learning and are disengaged from the prosocial influences

provided by supportive personnel at school, they tend to associate more with deviant peers (Chun et al., 2013; Su & Supple, 2014).

In one of the few longitudinal studies examining deviant peers and school connectedness, Henry (2008) found evidence of the mediating effect of peer SU on the relations between school attachment and tobacco, alcohol, and marijuana use. Although longitudinal, the SU outcomes used in Henry (2008) did not include a measure for initiation, examining instead the past 30 days and the intention to use within the next two years. Examining SUI outcomes are important as research indicates that SUI before age 15 significantly increases the risk of SUDs (HHS, 2016). Moreover, Henry (2008) did not include a broad measure of deviant peer affiliation as a predictor, examining instead affiliation with peers who use substances. Utilizing a broader measure of peer deviancy is important as many deviant peer behaviors in addition to peer SU (e.g., truancy, stealing, and fighting) have been shown to be strong predictors of SUI (Brown, Bakken, Ameringer, & Mahon, 2008).

Last, a cross-sectional study of Chinese adolescents found the negative association between school connectedness and problematic Internet use to be partially mediated by deviant peer affiliation (Li et al., 2013). Problematic Internet use may be a proxy for SUI because it represents another risk behavior (Liu, Desai, Krishnan-Sarin, Cavallo, & Potenza, 2011) associated with SUI in young adolescents (Rücker, Akre, Berchtold, & Suris, 2015). The limited amount of longitudinal research examining the joint effects of a broad measure of peer deviancy on the relation between school connectedness and SUI supports the need for more research on this possible mediation pathway.

School connectedness as a mediator. It is also possible that school connectedness mediates peer processes on SUI. In other words, school connectedness may serve as the gateway to which involvement with deviant peers impacts adolescent SUI. Indeed, social control theory (Hirschi, 1969) and the social developmental model (Catalano & Hawkins, 1996) support an etiological pathway to SUI in which school connectedness may act as a potential mediator in the relations between negative peer influence and subsequent SUI. Both theories posit that strong bonds to educational institutions may reduce adolescents' risk for SUI. When adolescents associate with prosocial peers, they are more likely to respect the expectations of teachers and may feel a stronger connection to doing well in school (Chun et al., 2013). This alternative pathway has not been widely studied, but work using similar constructs may give clues to the relation between peer affiliations, school connectedness, and SUI. In a longitudinal study of German adolescents, class climate mediated the association between peer alcohol use and multiple adolescent alcohol use outcomes. Adolescents who reported peer alcohol use at Time 1(Mean age = 10.3) also reported lower levels of class climate at Time 2 (Mean age = 11.9), which, in turn, resulted in more current use, amount of use, and binge drinking at Time 3 (Mean age = 13.3; Tomczyk, Isensee, & Hanewinkel, 2015). In this study, class climate encompassed the quality of both student-teacher and student-student relationships and is, thus, a proxy for school connectedness (Fletcher et al., 2008).

Results from another longitudinal study found school belonging as a mediator between peer victimization and adolescent alcohol use (Wormington, Anderson, Schneider, Tomlinson & Brown, 2016). Adolescents who reported peer victimization at Time 1 (Mean age = 13.5) also reported lower feelings of school belonging at Time 2

(Mean age = 14.6), which, in turn, resulted in more current and long-term alcohol use at Time 3 (Mean age = 15.8). Additionally, a cross-sectional study by Totura, Karver, and Gesten (2014) indicated that lower levels of classroom engagement and academic tasks mediated the association between peer victimization in middle school and academic achievement. Although different constructs, peer victimization and involvement with deviant peers have been shown to be correlated (Zhu et al., 2016). Prior work indicates that victimized youth may voluntarily affiliate with deviant peers who are similarly rejected, depressed, and experience low school connectedness (Mrug et al., 2014). Moreover, peer victimization (Nansel, Craig, Overpeck, Saluja, & Ruan, 2004) and involvement with deviant peers (Trucco et al., 2011) have been shown to be correlated with SUI. Since indicators of poor academic achievement are positively associated with adolescent SUI (Haller, Handley, Chassin, & Bountress, 2010), they may serve as a proxy for adolescent SUI outcomes. In recognition of the evidence to support both mediating pathways, one of the aims of this study is to test each potential mediation pathway using a longitudinal study design.

Parenting Influences

Limited research has examined if protective parenting practices buffer the positive relation between involvement with deviant peers and low school connectedness on adolescent SUI. Parents are a primary socializing agent for youth during childhood and early adolescence (Collins, Maccoby, Steinberg, Hetherington, & Bornstein, 2000) and continue to have a significant impact on SUI through young adulthood (Patock-Peckham, & Morgan-Lopez, 2006). Several protective parenting practices have been demonstrated to impact adolescent SUI including active parental monitoring and knowledge (Barnes,

Hoffman, Welte, Farrell, & Dintcheff, 2006), consistent parental control and disciplinary practices (Pears, Capaldi, & Owen, 2007), active parental involvement and support (Kumar, O'Malley, & Johnston, 2014), effective parental communication (Lac et al., 2011), high quality parent-youth relationships (Gutman, Eccles, Peck, & Malanchuk, 2011), and the use of substance-specific parental control practices (Handley & Chassin, 2013). The protective influences these parenting practices offer may help explain why some adolescents who associate with deviant peers and have low levels of school connectedness do not use substances (Mrug & Windle, 2008).

Although many studies have focused on individual aspects of parenting, research supports the importance of examining multiple aspects of parenting within the same model. The seminal work of Baumrind (1971; 1991) offers a typology to help delineate how patterns of parenting practices, reflecting control/demandingness and warmth/responsiveness, can be combined to reflect an overall parenting style. Initially, three parenting styles were identified: (1) authoritative, in which parents are warm and communicative, but also exert appropriate control; (2) authoritarian, in which parents exert excessive control while also lacking warmth; and (3) permissive, in which parents are indulgent and responsive with little to no control. Maccoby and Martin (1983) extended Baumrind's typology by adding a fourth parenting style—neglectful—in which parents lack warmth and control. The resulting four classifications of parenting style continue to be widely used to examine many parenting practices and their impact on adolescent SU (Abar, Jackson, & Wood, 2014).

Moreover, along with studies that examined multiple, general parenting practices focused on support and control (Dembo et al., 2015; King, Vidourek, Merianos, &

Bartsch, 2015), other studies have also included substance use-specific parenting practices, such as communication about the dangers of and setting and enforcing rules about youth SU (Van Zundert, Van Der Vorst, Vermulst, & Engels, 2006; Vermeulen-Smit, Verdurmen, Engels, & Vollebergh 2015). Recognizing that parenting practices do not operate in isolation and that dimensions of parental warmth and control can be highly correlated (Lac, Alvaro, Crano, & Siegel, 2009), there is a critical need for a more comprehensive measure of parenting. However, such a measure does not exist. Thus, this study will attempt to develop a comprehensive and psychometrically strong measure of parenting quality that encompasses multiple aspects of parental warmth/responsiveness (i.e., involvement, communication, and warmth in parent-youth relationships), parental control/demandingness (i.e., monitoring, knowledge, and discipline practices) and substance use-specific parenting practices (i.e., attitudes, beliefs, and reactions to youth SU). Effective parenting quality will be depicted by caregivers who score higher on measures of each of the parenting quality dimensions.

Parenting influences as a moderator. Guided by Bronfenbrenner's (1979) ecological model, researchers have investigated mesosystem influences on SUI by examining how proximal processes in one microsystem (e.g., an adolescent's parents) may have a bearing on relationships in another (e.g., the peer group; Bacio et al., 2015; Schelleman-Offermans, Knibbe, & Kuntsche, 2013). Although early adolescence is a period when youth can become more susceptible to peer influences than parental influences, parenting practices may still offer some protection for youth from the influences of affiliating with deviant peers (Bogenschneider, Wu, Raffaelli, & Tsay, 1998). Additionally, the social developmental model's focus on protective factors against

adolescent SUI (Catalano et al., 2004; Hawkins, Kosterman, Catalano, Hill, & Abbott, 2008) supports the role that parenting practices can play in buffering an adolescent from the adverse effects of associating with deviant peers and low school connectedness. More specifically, it is possible that the impact of involvement with deviant peers and low school connectedness on the odds of SUI is contingent on parenting quality. That is, when each dimension of parenting quality is high, the impact of involvement with deviant peers is lessened and school connectedness is strengthened.

Parenting practices may protect adolescents by limiting the amount of unsupervised time spent with deviant peers or by educating youth about the potential consequences of imitating substance-using-peer behaviors (Marschall-Lévesque, Castellanos-Ryan, Vitaro, & Séguin, 2014). Moreover, parenting practices, such as parents' monitoring of youths' school events (e.g., homework deadlines, upcoming exams, and problems with teachers), may buffer the adverse effects of low school connectedness (Lowe & Dotterer, 2013; Woolley, Kol, & Bowen, 2009). Despite the protection that parenting practices may offer, little empirical investigation of parenting as a moderator of these etiological pathways to SUI has been conducted.

Parenting as a moderator on the association between involvement with deviant peers and SUI. Most of the prior studies examining parenting as a moderator of the association between involvement with deviant peers and SUI have been cross-sectional and focused only on one or two specific parenting practices. In a cross-sectional study of Australian adolescents that examined two different parenting practices (i.e., parental disapproval of SU and parental monitoring), only parental disapproval of SU reduced the impact of peer drug use on adolescent SU (Chan, Kelly, Carroll, & Williams, 2017).

Results from a cross-sectional study of African American youth showed that low levels of parental monitoring and inconsistent discipline moderated the association between peer pressure and SU, revealing that the relation between peer pressure and drug use was strengthened as a function of poor parenting (Kung & Farrell, 2000). Moreover, in a longitudinal study of primarily White youth examining two parenting practices (i.e., parental monitoring and parental support), parental monitoring buffered the adverse effects of peer deviance, but only for alcohol misuse (Barnes et al., 2006). Results demonstrated higher rates of alcohol misuse among youth with parents who were low in parental monitoring compared to those parents who were high in parental monitoring (Barnes et al., 2006). Parental monitoring may help to ensure that rules are followed and that opportunities for deviant peer influences are limited. When parents are aware of youths' behaviors, they can intervene when rules are broken. As such, youth who experience the protective effects of positive parenting would be less likely to be influenced by peer pressure than those who experience poor parenting (Kung & Farrell, 2000). Few studies have examined the moderating effects of parenting practices other than parental monitoring on this mediated pathway. A comprehensive measure of parenting quality will help to investigate the potential protective role of other parenting practices against the effects of involvement with deviant peers on SUI.

Parenting as a moderator on the association between school connectedness and SUI. Similarly, only a few studies have examined parenting practices as a moderator of the association between school influences and SUI. Cross-sectional results from a study of Danish youth indicated a moderating effect of parental smoking attitudes on the association between school connectedness and smoking behavior (Rasmussen,

Damsgaard, Holstein, Poulsen, & Due, 2005). Results showed that among boys, those who were more closely connected to school were less likely to smoke, but only if their parents also displayed negative attitudes about smoking (Rasmussen et al., 2005). In a longitudinal study that examined alcohol use during the transition from middle school to high school, results demonstrated that youth with parents high in parental monitoring had a higher likelihood of progressing from light drinking to heavy drinking after the transition compared to youth whose parents were low in parental monitoring (Jackson & Schulenberg, 2013). School transitions may be a proxy for school connectedness as the challenges that transitions create in adapting to a new environment are often associated with both low school connectedness and increased risk for adolescent SUI (Schulenberg, Patrick, Maslowsky, & Maggs, 2014; Seidman & French, 2004). Few studies have examined the moderating effects of parenting practices on this mediated pathway. A comprehensive measure of parenting quality will aid in investigating the potential protective role of parenting practices as a buffer against the effects of low school connectedness on SUI.

Rationale for Examining Initiation of Substances Separately

This study examined SUI of different substances (i.e., alcohol, cigarettes, and marijuana) in separate models. One reason to examine SUI separately across different substances is based on several cross-sectional epidemiological surveys of the general population that have documented strong age-related trends in the initiation patterns of legal (e.g., alcohol and cigarettes) and illicit drugs (e.g., marijuana). Results of the MTF study demonstrated that SU increases substantially during adolescence, with alcohol being the most commonly used substance followed by similar rates of usage for cigarettes

and marijuana (Johnston et al. 2018). These patterns have also been confirmed in several longitudinal studies (Ellickson, Hays, & Bell, 1992; Kandel 1975; Kandel & Logan 1984).

Another rationale for examining the initiation of each substance is based on inconsistent findings in the literature. These findings demonstrated different associations between each substance and the study variables (i.e., involvement with deviant peers, school connectedness, and parenting quality) examined in this study. Many studies have shown that negative peer influences are associated with the initiation of all substances (Fergusson, Swain-Campbell, & Horwood, 2002; McDonough et al., 2016). However, other studies have suggested mixed results. In a study that examined the association of perceived peer SU on SUI, perceived peer marijuana and alcohol use were associated with the likelihood of initiating marijuana use, while perceived peer cigarette, alcohol, and marijuana use were not associated with initiation of cigarette use (D'Amico & McCarthy, 2006).

Prior research has also demonstrated that high school connectedness is associated with delaying initiation of all three substances (Catalano et al., 2004). However, some studies have shown mixed results across substances. In a study that examined different aspects of school connectedness, teacher support delayed initiation of cigarette and alcohol use initiation but not marijuana use initiation (McNeely & Falci, 2004). In a study that examined the association between school attachment and different SUIs, results were also inconsistent, indicating only a significant association for initiation of cigarette use (Dornbusch, Erickson, Laird, & Wong, 2001). In sum, these inconsistent findings in the literature, evidence of substance-specific developmental trends, and conceptual

differences between them (e.g., legal versus illegal access and consequences of use), support the examination of each substance separately.

III. THE CURRENT STUDY

Study Aims and Hypotheses

The current study will examine indirect pathways to SUI in a mid- to late adolescent sample of youth ages 14-17. Aim I is to develop a comprehensive and psychometrically sound measure of parenting quality. It is first hypothesized (Aim I: H1) that 14 parent-report measures of parenting practices, attitudes, and reactions to SU can be reduced using exploratory factor analyses (EFA) to two factors for assessing parenting quality. One parenting quality factor will include only items identified in the literature as parental warmth/responsiveness and the second parenting quality factor will include only items that represent parental control/demandingness. It is also hypothesized (Aim I: H2) that these results will be consistent with an independent sample using confirmatory factor analyses (CFA).

Informed by Bronfenbrenner's (1979) ecological model of human development, Aim II is to examine the role of involvement with deviant peers in early adolescence (W_3) as a potential mediator in the association between school connectedness at W_2 and SUI (i.e., alcohol, cigarettes, and marijuana) in middle adolescence (W_5). It is hypothesized that more school connectedness at W_2 will be related to less involvement with deviant peers at W_3, which, in turn, will be related to lower odds of alcohol (Aim II: H1), cigarette (Aim II: H2), and marijuana (Aim II: H3) use initiation at W_5. Given the support for an alternative pathway (Catalano & Hawkins, 1996), Aim III is to examine the role of school connectedness in early adolescence (W_3) as a potential mediator in the

association between involvement with deviant peers at W_2 and SUI in middle adolescence (W_5). It is hypothesized that less involvement with deviant peers at W_2 will be related to more school connectedness at W_3, which, in turn, will be related to lower odds of alcohol (Aim III: H1), cigarette (Aim III: H2), and marijuana (Aim III: H3) use initiation at W_5.

Given that parenting practices may play a role in buffering the effects of negative social contexts and/or enhancing the positive effects of adaptive social contexts (Kung & Farrell, 2000; Rasmussen et al., 2005), Aims IV and V are to examine the role of the parenting quality factors that emerge from the EFA and CFA as a moderator of each of the proposed pathways. More specifically, Aim IV is divided into two sub-aims that examine the moderation effects of the two hypothesized parenting quality factors in early adolescence (W_3) — parental warmth/responsiveness (Aim IV-A) and parental control/demandingness (Aim IV-B) — on the association between involvement with deviant peers at W_3 and school connectedness at W_2 on SUI in middle adolescence (W_5). It is hypothesized that the impact of school connectedness on the odds of SUI is contingent on each of these two dimensions of parenting quality. When each dimension of parenting quality is high, the positive impact of school connectedness on reducing the odds of alcohol (Aim IV-A: H1 and Aim IV-B: H1), cigarette (Aim IV-A: H2 and Aim IV-B: H2), and marijuana (Aim IV-A: H3 and Aim IV-B: H3) use initiation is strengthened.

Last, Aim V is to examine the moderation effects of the two hypothesized parenting quality factors at W_3—parental warmth/responsiveness (Aim V-A) and parental control/demandingness (Aim V-B)—on the association between school connectedness at

W_3 and involvement with deviant peers at W_2 on SUI at W_5. It is hypothesized that the impact of involvement with deviant peers on SUI is contingent on each of these two dimensions of parenting quality. When each dimension of parenting quality is high, the negative impact of involvement with deviant peers on increasing the odds of alcohol (Aim V-A: H1 and Aim V-B: H1), cigarette (Aim V-A: H2 and Aim V-B: H2), and marijuana (Aim V-A: H3 and Aim V-B: H3) use initiation is lessened.

Significance of the Study

Although several researchers have identified the influences of involvement with deviant peers, school connectedness, and parenting quality on SUI individually, few have tested them within the same study. Additionally, few have tested these influences in a sample of youth in mid- to late adolescence. This study aims to address these gaps in the literature. First, this study examined the combined influences of these three contexts on SUI with a mid- to late adolescent sample (ages 14-17) utilizing conditional process modeling to integrate moderated mediation effects within the same model. Second, of the few studies that have examined multiple contextual influences on SUI within the same design, most have utilized cross-sectional data. This study addressed the limitations found in cross-sectional research designs by utilizing a longitudinal design, which allows for examination of the direction of effects and investigation of the possibility that some contextual influences may be only indirectly related to SUI (Cleveland, Feinberg, & Jones, 2012; Mason et al., 2016).

Moreover, despite the interdependence of peer involvement and school connectedness, few studies have looked at the mechanisms through which these two social contexts impact SUI in mid- to late adolescence. Moreover, no studies to date have

examined alternative pathways to SUI through both involvement with deviant peers and school connectedness within the same longitudinal study. Testing for potential indirect effects may provide a better understanding of why some adolescents, who affiliate with deviant peers and have low school connectedness, initiate SU early, while others do not. Identifying significant mediators will help inform interventions to interrupt the pathways to SUI during middle adolescence. Third, prior studies have utilized parenting measures that either fail to assess parental warmth and control items simultaneously or omit critical substance use specific parenting measures. This study developed a comprehensive and psychometrically strong measure of parenting quality which addresses both gaps found in parenting measures utilized in prior work.

Fourth, this study tested the moderating effects of each dimension of parenting quality, identified in the new measure, on alternative pathways to SUI via involvement with deviant peers and school connectedness. Since adolescents are often more exposed to peer and school influences than younger children, it is important to examine whether parenting may buffer the impacts of these two important socialization contexts. However, a notable limitation in the literature are the few longitudinal studies that investigate the moderating effects of multiple parenting practices on both peer and school influences for SUI. While some studies have focused primarily on individual parenting practices as moderators, few studies examine an array of positive parenting practices that integrate multiple domains, across multiple contexts, within the same model. Examining moderators is crucial when investigating SUI, as interventions focusing on specific risk or preventive variables may reduce SUI only for specific groups (Wormington, Anderson, Tomlinson, & Brown, 2013). Last, to minimize reporter bias and address a common

method variance problem typically found within studies utilizing a single reporter (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003), this research utilizes parent reports to measure parenting quality and youth reports to measure peer deviancy and school connectedness.

IV. METHOD

Parent Study

The secondary data used for this study comes from the Adolescent and Family Development Project (AFDP) at the University at Buffalo. The AFDP is in its sixth year of a longitudinal study that integrates developmental changes and social contextual influences to understand the contributing factors for adolescent SUI. The use of the AFDP dataset is ideal for the development of a comprehensive parenting quality measure and the examination of contextual influences on SUI, due to its longitudinal design, use of multiple parenting measures, and data gathered from multiple informants. The initial wave of the AFDP study consisted of (N = 387) families recruited in Erie County, NY utilizing a random-digit-dial sample of telephone numbers. Mean age for adolescent participants at the initial assessment was 11.6 years (SD = 0.54). W_2 (N = 373) was assessed approximately one year later and W_3 (N = 370) approximately one year after that (Meisel, Colder, & Hawk, 2015).

Procedure

Target family interviews were conducted in a research laboratory at the University at Buffalo Child and Family Development Project's research lab. The study was described to parents and adolescents as an investigation of the transition into adolescence. Adolescents were eligible for recruitment if they were between the ages of

11 and 12 and did not have any language barriers or physical disabilities that would preclude them from completing the assessment. Recruitment began in April 2007, with the second and third assessments occurring each year after that. After completing the consent and assent procedures, the child and caregiver interviews took place in separate rooms to enhance privacy. All questionnaires were read aloud, and responses were entered directly into a computer by the participants to protect confidentiality and to minimize the occurrence of random responding and missing data points (Trucco et al., 2014). Each interview took approximately two hours to complete. These procedures were the same for the first three waves of the study.

Wave four (W_4; $N = 369$) took place approximately one year after W_3 and W_5 ($N = 362$) one year after W_4. Both W_4 and W_5 consisted of a brief telephone-based audio-computer-assisted self-interviewing (CASI) survey of SU that took 10 to 15 minutes to complete. Parents provided consent over the phone and were given a phone number and PIN for their adolescent to use. Assent from the adolescent was obtained at the initiation of the audio-CASI survey. Participating families were compensated an average of $100 for W_1 - W_3, and adolescents were given a small incentive between $5 and $15 at each wave (Meisel et al., 2015). All study procedures were approved by the Institutional Review Board (IRB) at The University at Buffalo (Scalco et al., 2014).

Participants

This study collected data from multiple informants: youth, their caregivers, and their peers' caregivers. The current study data used to conduct the EFA are based on assessments from youth caregivers ($N = 370$) from W_3 referred to as the target caregivers. Since parenting was assessed only in the first three waves of the parent study, W_3 was

selected as it was prior to and most proximal to the latest W_5 SU outcomes made available by the Principal Investigator of the parent study. The mean age for youth participants was 13.6 (*SD* = 0.59), and 55% were female. The mean age for caregiver participants was 44.9 (*SD* = 6.18), and 87% were female. Caregiver participants were White (87%), Black (9%), Hispanic (2%), and of mixed ethnic background (4%). Mean family income was $83,662, public assistance was received by 12% of the families, and most caregivers (60%) had completed college or some graduate/professional school. Additional sample demographic information for W_3 participants is presented in Table 1.

The data used for confirming the factor structure identified in the EFA also came from W_3 of the AFDP study. Each adolescent was asked to name three of their closest friends. One of the adolescent's peers and the peer' caregiver was invited to also participate in the study. Measures of parenting based on self-reports from the caregivers of the adolescents' peers (*N* = 326) were used as the sample for the CFA and are referred to as the peer caregivers. The mean age of peer participants was 13.6 (*SD* = 1.09) years old. The mean age of peer caregiver participants was 44.3 (*SD* = 6.54) years old, and 91% of those caregivers were female caregivers. Participants were White (88%), Black (9%), Hispanic (3%), and of mixed ethnic background (3%). Mean family income was $88,246, public assistance was received by 11%, and 60% completed college or some graduate/professional school. Results of chi-square and t-tests showed that caregivers from target families did not significantly differ from caregivers from peer families (Table 1). Therefore, it was concluded that data from peer families could be used to conduct the CFA.

The data used for examining the moderated mediation effects are based on youth participant reports from W_2, W_3, and W_5 and caregiver participant reports from W_3. At W_2, the mean age for (N = 373) youth participants was 12.6 (SD = 0.58), and 55% were female. At W_2, the mean age for (N = 373) caregiver participants was 43.7 (SD = 6.26), and 88% were female. At W_5, the mean age for (N = 361) youth participants was 16 (SD = 0.61), and 55% were female.

Ethical considerations. Before requesting IRB approval from Florida International University (FIU), the Principal Investigator of the parent AFDP study applied for and received an amended IRB approval to allow their data to be used as secondary data in this study on March 15th, 2016. The current study was deemed exempt by the FIU Office of Research Integrity due to the use of secondary data (Figure 2). As a secondary data analysis, this study poses no risk of harm or direct benefits to the participants. Nevertheless, several precautions were taken. First, the student investigator had no direct contact with the study participants. Second, all data were de-identified to minimize the risk of unintended disclosure and information about study participants. Third, all de-identified data was forwarded to FIU from the Principal Investigator using a password protected zip file and stored on an encrypted network. Fourth, network password access was limited to the student investigator conducting this study and his dissertation committee. Fifth, all data will be destroyed within 12 months of the completion of the study.

Measures

Parent-report measures used as indicators of parenting. Parent-report measures of a variety of different parenting practices, attitudes, and reactions to SU

assessed at W_3 were utilized. A total of 14 parent self-report subscales with adequate psychometric properties were utilized as indicators in the EFA. The first three subscales — (1) parental monitoring/knowledge, (2) child disclosure, and (3) parental solicitation — were extracted from a measure developed by Kerr and Stattin (2000). Six other subscales — (4) shared activities, (5) parental involvement with the child, (6) time spent with the child, (7) positive parenting, (8) parent-child relationships, and (9) curfew — were taken from the Loeber Youth Questionnaire (LYQ) referenced in Jacob, Moser, Windle, Loeber, and Stouthamer-Loeber (2000). Three other subscales — (10) parental efficacy, (11) parental reactions to child cigarette use, and (12) parental reactions to child alcohol use — were derived from the work of Kodl and Mermelstein (2004). The remaining two subscales were (13) obligations to disclose — a scale developed by Smetana, Metzger, Gettman, and Campione-Barr (2006) and (14) legitimacy of parental authority — using the Adolescents and Parents Conceptions of Parental Authority scale developed by Smetana (1988) and Darling, Cumsille, Caldwell, and Dowdy (2006). Parenting variables used as indicators in the EFA and CFA were created by summing the individual items within each parenting measure. Cronbach's alphas for the parenting measures ranged from .64 to .90 and were adequate in this sample. A brief description of these 14 measures and their reliability follow.

(1) Parental monitoring/knowledge. This subscale consisted of nine items using a Likert scale that ranged from 1 (*Never*) to 5 (*Always*) to assess parents' monitoring/knowledge of their child's whereabouts, activities, and associations. Participants were asked questions such as, "Do you know what your child does during his/her free time?" and "Do you know whom your child has as friends during his/her free

time?" Higher values on this measure indicated more parental monitoring/knowledge. The internal consistency (α = .74) was adequate in this sample. A complete list of items can be found in Table A1 in the Appendix.

(2) Child disclosure. This subscale consisted of five items using a Likert scale that ranged from 1 (*Never*) to 5 (*Always*) to assess how much their children provide knowledge about their whereabouts, activities, and associations. Participants were asked questions such as, "Does your child talk at home about how he/she are doing in the different subjects in school?" and "Does your child usually tell you how school was when he/she gets home (how they did on different exams, they're relationships with teachers, etc.)?" High values on this measure indicated greater child disclosure. The internal consistency (α = .76) was adequate in this sample. A complete list of items can be found in Table A2 in the Appendix.

(3) Parental solicitation. This subscale consisted of five items using a Likert scale that ranged from 1 (*Never*) to 5 (*Always*) to assess if parents actively solicit information about their child's whereabouts, activities, and associations. Participants were asked questions such as, "In the last month, have you talked with the parents of your child's friends?" and "During the past month, how often have you started a conversation with your child about his/her free time?" Higher values on this measure indicated higher parental solicitation. The internal consistency (α = .67) was adequate in this sample. A complete list of items can be found in Table A3 in the Appendix.

(4) Shared activities. This subscale consisted of four items scored using a Likert scale ranging from 1 (*More than one month ago*) to 4 (*Yesterday/today*) to assess topics that parents and their children may have talked about or done together in the past six

months. Participants were asked questions such as, “When was the last time that you discussed with your child his/her plans for the coming day?” and “When was the last time you talked with your child about what he/she had done during the day?” Higher values on this measure indicated more shared activities. The internal consistency (α = .78) was adequate in this sample. A complete list of items can be found in Table A4 in the Appendix.

(5) Parental involvement with child. This subscale consisted of five items scored using a Likert scale ranging from 1 (*Almost never*) to 3 (*Often*) to assess the level of parental involvement with their children. Participants were asked questions such as, “How often do you have a friendly chat with your child?” and “Do you talk with your child about how he/she is doing in school?” High values on this measure indicated more parental involvement with their children. The internal consistency (α = .64) was low but acceptable in this sample. A complete list of items can be found in Table A5 in the Appendix.

(6) Time spent with child. This subscale consisted of four items scored using a Likert scale ranging from 1 (*Almost never*) to 3 (*Often*) to assess the frequency of parental involvement. Participants were asked questions such as, “On the average, how much time each day are you together with your child on weekdays, that is, when you and your child are both awake?” and “On weekdays, how much of that time are you doing something together, like making something, playing a game, talking, or going out together?” Higher values on this measure indicated more time spent with their children. The internal consistency (α = .80) was adequate in this sample. A complete list of items can be found in Table A6 in the Appendix.

(7) Positive parenting. This subscale consisted of eight items scored using a Likert scale ranging from 1 (*Almost never*) to 3 (*Often*) to assess the type and frequency of parental praise. Participants were asked questions such as, "In the past six months, when your child did something that you liked or approved of, how often did you give him/her a wink or smile" and "Say something nice about it; praise or give approval?" Higher values on this measure indicated more positive parenting. The internal consistency ($\alpha = .73$) was adequate in this sample. A complete list of items can be found in Table A7 in the Appendix.

(8) Parent-child relationships. This subscale consisted of 15 items scored using a Likert scale ranging from 1 (*Almost never*) to 3 (*Often*) to assess the nature and quality of parental relationships. Participants were asked questions such as, "In the past six months, how often did you think your child was a good kid?" and "Felt proud of him/her?" Higher values on this measure indicated a greater parent-child relationship. The internal consistency ($\alpha = .80$) was adequate in this sample. A complete list of items can be found in Table A8 in the Appendix.

(9) Curfew. This subscale consisted of three items scored using a Likert scale ranging from 1 (*No set time*) to 3 (*Always set time*) to assess whether and how often parents set rules about when to be home. Participants were asked questions such as, "Does your child have a set time to be home on school nights?" and "Does your child have a set time to be home on weekend nights?" Higher values on this measure indicated more use of a curfew. The internal consistency ($\alpha = .69$) was adequate in this sample. A complete list of items can be found in Table A9 in the Appendix.

(10) Parental efficacy. This subscale consisted of 14 items scored using a Likert scale ranging from 1 (*Not at all confident*) to 10 (*Extremely confident*) to assess how well parents believe they can influence child behavior in different domains. Participants were asked questions such as, "How confident are you that you can keep your child away from the wrong kinds of kids?" and "prevent your child from using drugs?" Higher values on this measure indicated higher parental efficacy. The internal consistency ($\alpha = .89$) was high in this sample. A complete list of items can be found in Table A10 in the Appendix.

(11) Parental reactions to child cigarette use. This subscale consisted of 22 items scored using a Likert scale ranging from 1 (*Not at all likely*) to 4 (*Very likely*) to assess parental beliefs, explicit messages, and reactions to youth smoking. Participants were asked questions such as, "If you knew your child smoked or tried smoking, how likely is it that you would be disappointed with him/her" and "yell at him/her in disapproval?" Higher values on this measure indicated more negative attitudes and rules against smoking. The internal consistency ($\alpha = .75$) was adequate in this sample. A complete list of items can be found in Table A11 in the Appendix.

(12) Parental reactions to child alcohol use. This subscale consisted of 22 items scored using a Likert scale ranging from 1 (*Not at all likely*) to 4 (*Very likely*) to assess parental beliefs, explicit messages, and reactions to alcohol use. Participants were asked questions such as, "If you knew your child drank alcohol or tried alcohol, how likely is it that you would be disappointed with him/her" and "yell at him/her in disapproval?" Higher values on this measure indicated more negative attitudes and rules against alcohol use. The internal consistency ($\alpha = .76$) was adequate in this sample. A complete list of items can be found in Table A12 in the Appendix.

(13) Obligations to disclose. This subscale consisted of 14 items scored using a Likert scale ranging from 1 (*Never*) to 5 (*Always*) to assess the extent to which their children have a duty or obligation to disclose their behavior to them. Participants were asked questions such as, "Without you asking, how often does your child tell you or is willing to tell you about the following things? Hanging out at a friend's when no adult is home and how teens spend their money." Higher scores on this measure indicated a greater obligation to disclose. The internal consistency ($\alpha = .88$) was high in this sample. A complete list of items can be found in Table A13 in the Appendix.

(14) Legitimacy of parental authority. This subscale consisted of 21 items scored using a Likert scale ranging from 1 (*Strongly disagree*) to 5 (*Strongly agree*) to assess parents' conceptions of the legitimacy of their parental authority regarding acts in different domains. Participants were asked questions such as, "It is ok for me to make rules about what my child does after school and my child not doing assigned chores." Higher scores on this measure indicated a higher conception of the legitimacy of their parental authority. The internal consistency ($\alpha = .90$) was high in this sample. A complete list of items can be found in Table A14 in the Appendix.

Measures to assess convergent validity. Several additional parent- and youth-report measures were used to assess convergent validity with subscales derived from the EFA. Parenting variables used to assess convergent validity were created by summing the individual items within each parenting measure. It was hypothesized that the following two measures would be related with each of the parenting quality factors. A brief description of these two measures and their reliability follow.

Parental demandingness. This child-report scale consisted of five items scored using a Likert scale ranging from 1 (*Strongly disagree*) to 5 (*Strongly agree*) adopted from the Parenting Style Inventory scale developed in Darling and Toyokawa (1997). Participants were asked to rate their level of agreement on questions such as, "If I do not behave myself, my parent will punish me." Higher scores on this measure indicated more parental demandingness. The internal consistency ($\alpha = .66$) was adequate in this sample. A complete list of items can be found in Table A15 in the Appendix.

Parental control. This subscale included five items scored using a Likert scale ranging from 1 (*Never*) to 5 (*Always*) from a subscale developed by Kerr & Stattin (2000). Participants were asked questions such as, "If your child has been out late one night, do you require that he/she explain what he/she did and who he/she was with?" Higher scores on this measure indicated higher parental control. The internal consistency ($\alpha = .66$) was adequate in this sample. A complete list of items can be found in Table A16 in the Appendix.

Measures to assess discriminant validity. Several additional parent- and youth-report measures were used to assess discriminant validity with subscales derived from the EFA. Parenting variables used to assess discriminant validity were created by summing the individual items within each parenting measure. It was hypothesized that the following three measures would not be related to each of the parenting quality factors. A brief description of these three measures and their reliability follow.

Parental depression. This scale was comprised of 20 items scored using a Likert scale ranging from 0 (*Never*) to 3 (*Often*). This scale was adopted from the Center for

Epidemiologic Studies Depression Scale developed in Radloff (1977). Participants were asked how they have been feeling in the past month such as, “Were you bothered by things?” and “Did you feel depressed?” Higher scores on this measure indicated more depressive symptomology. The internal consistency (α = .91) was high in this sample. A complete list of items can be found in Table A17 in the Appendix.

Caregiver injury and conflict. This scale was comprised of six items scored using a Likert scale ranging from 1 (*Once in the past year*) to 8 (*This has never happened*) from the Revised Conflict Tactics Scales developed by Straus, Hamby, Boney-McCoy, and Sugarman (1996). Participants were asked questions about their relationship with their significant other/romantic partner/spouse who lives in the home and who is involved with caring for their child. For example, participants were asked how many times they, “accused their partner of being a lousy lover” and “threatened to hit or throw something at their partner.” Higher scores on this measure indicated lower caregiver injury and conflict. The internal consistency (α = .75) was adequate in this sample. A complete list of items can be found in Table A18 in the Appendix.

Current nicotine use. This scale was comprised of six dichotomous (yes/no) items and discrete category items adopted from the Fagerstrom Test for Nicotine Dependence developed by Heatherton, Kozlowski, Frecker, and Fagerstrom (1991). Participants were asked dichotomous questions such as, “At present, do you find it difficult to refrain from smoking in places where it is forbidden?” Participants were also asked questions with discrete answer categories such as “At present, how many cigarettes/days do you smoke? (e.g., 10 or less, 11-20, 21-30, 31 or more). Responding “yes” and higher scores on the discrete categories indicated dependence on nicotine. The

internal consistency (α = .70) was adequate in this sample. A complete list of items can be found in Table A19 in the Appendix.

Mediating variables.

School connectedness. Child-report of school connectedness was assessed with a scale that consisted of nine items scored using a Likert scale ranging from 1 (*Strongly agree*) to 4 (*Strongly disagree*) from a measure developed by Resnick et al. (1997). Participants were asked questions regarding how much they agreed with the following statements such as, "You feel close to people at your school" and "The teachers at your school treat students fairly." Individual items were summed to create a scale score. Higher mean scores on this measure indicated greater school connectedness. The internal consistency at W_2 (α = .75) and W_3 (α = .81) were adequate in these samples. W_3 is used for the model testing school connectedness as a mediator, while W_2 used school connectedness as an exogenous variable in the alternate mediating pathway. A complete list of items can be found in Table A20 in the Appendix.

Involvement with deviant peers. Involvement with deviant peers was assessed from the child's perspective with a scale that consisted of 14 items that were developed from Fergusson, Woodward, and Horwood (1999). Adolescents reported on perceived peer deviance among their three closest friends with dichotomous items regarding behaviors such as theft, school truancy, and physical aggression (*'No'* = 0; *'Yes'* =1) and summed to create a scale score. Higher scores on this measure indicated greater peer deviance. The internal consistency at W_2 (α = .81) and W_3 (α = .87) were high in these samples. W_3 is used for the model testing involvement with deviant peers as a mediator,

while W_2 uses involvement with deviant peers as an exogenous variable in the alternate mediating pathway. A complete list of items can be found in Table A21 in the Appendix.

Outcome variables.

Alcohol use initiation. Lifetime use of alcohol was assessed at W_5 when youth were between the ages of 14-17 *(M* = 16; *SD* = .61) with one dichotomous item (yes/no) from the National Youth Survey (Elliott & Huizinga, 1983). Youth participants were asked "Have you EVER used alcohol beverages such as beer, wine, wine coolers, or hard liquor without your parents' permission (even just a few sips)?

Cigarette use initiation. Lifetime use of cigarettes was assessed at W_5 when youth were between the ages of 14-17 *(M* = 16; *SD* = .61) with one dichotomous item (yes/no) from the National Youth Survey (Elliott & Huizinga, 1983). Youth participants were asked "Have you EVER used cigarettes without your parents' permission (even just a few puffs)?

Marijuana use initiation. Lifetime use of marijuana was assessed at W_5 when youth were between the ages of 14-17 *(M* = 16; *SD* = .61) with one dichotomous item (yes/no) from the National Youth Survey (Elliott & Huizinga, 1983). Youth participants were asked "Have you EVER used marijuana?

Covariates. Research supports a strong association between family SES (Patrick, Wightman, Schoeni, & Schulenberg, 2012) and family structure (Eitle, 2005) on parenting and SUI outcomes. Accordingly, (1) family income, (2) public assistance income, (3) parent education, and (4) marital status will be included as statistical control variables. To avoid multicollinearity, a composite family SES variable was computed (i.e., family income, public assistance income, and parent education) following the same

approach found in Trucco et al. (2014). Additionally, youth demographic characteristics— (5) age, (6) race, and (7) biological sex—were also included as statistical control variables in the analyses. The family SES and youth age variables were standardized prior to running all moderated mediation analyses. Last, (8a) alcohol use initiation prior to W_3, (8b) cigarette use initiation prior to W_3, and (8c) marijuana use initiation prior to W_3 were included as statistical control variables. These covariates were entered separately, based on the SUI outcome examined in each model, to prevent youth SUI at W_1 and W_2 from confounding the potential effects of involvement with deviant peers and school connectedness.

Data Analysis

Three types of analyses were conducted to examine the hypotheses supporting the five aims of this study. First, using the target caregiver data, an EFA with principal axis factoring extraction and oblique rotation (Direct Oblimin) was conducted with IBM Statistical Package for Social Science (SPSS) version 22.0 (IBM SPSS Corp, 2013) to identify the underlying structure of the 14 parent-report subscales. Second, using the peer caregiver data, a CFA was conducted with Mplus version 7 (Muthén &Muthén, 1998) to confirm the underlying structure identified in the EFA. The EFA and CFA were used to develop a measure of parenting quality and to examine the hypotheses supporting Aim I. Third, the statistical macro PROCESS (Hayes, 2013; Model 14) was used to test for and estimate direct and indirect effects within the moderated mediation pathways and the hypotheses supporting Aims II-V. Before conducting the two factor analyses and running the moderated mediation models, a variety of preliminary analyses were conducted to

profile the variables under study, examine correlations, address missing data, and to test assumptions.

Exploratory factor analyses. Before performing the EFA, all individual items for each measure were checked to make sure they were scored in the same direction. Items that were scored in opposite directions were reversed as needed. The data were tested for assumptions of normality, as well as for the absence of multivariate outliers. One variable, Shared Activities, showed a departure from normality based on a visual inspection of the histogram and with skewness of -2.69 (SE = 0.13) and kurtosis of 8.39 (SE = 0.25). A variety of transformations suggested by Tabachnick and Fidell (2007) for negatively skewed variables were examined. The reciprocal transformation was selected as it provided the greatest impact on reducing skewness of -1.67 (SE = 0.13) and kurtosis of 1.55 (SE = 0.25) within more acceptable normality limits. A review of Mahalanobis distances using the linear regression function in SPSS 22, identified seven cases as multivariate outliers, and therefore, these cases were eliminated.

After assumption testing, variables were standardized so that they were on the same metric prior to performing analyses and the data were further screened to determine its adequacy for factor analysis. A viable factor analysis requires each item to be correlated with at least one other item at the level of 0.30 or greater (Tabachnick & Fidell, 2007; Field, 2013). A review of the factor correlation matrix showed that 12 of the 14 items had correlations (*r*) more than 0.30. The two items that failed to show correlations above 0.30—Positive Parenting and Curfew—indicated that they were not highly correlated with any other item within the same latent factor and were not included in further analyses. To assess for potential multicollinearity, the determinant of the

correlation matrix was examined (Determinant = 0.011). Since this value was greater than the required cutoff of 0.00001, multicollinearity was not a concern (Field, 2013). Additionally, the Kaiser-Meyer-Olkin statistic (KMO = 0.77) was greater than the required cutoff of 0.60, verifying the sampling adequacy for the analysis (Tabachnick & Fidell, 2007). The Bartlett's Test of Sphericity was significant ($p < 0.001$), further supporting the suitability of the data (Field, 2013). Overall, the individual item correlations suggested that the correlation matrix for the items was adequate to apply a factor analytic model.

Confirmatory factor analyses. Since the sample used in the CFA is different from the EFA, tests were conducted for the existence of multivariate outliers, evidence of multicollinearity, and possible violations of univariate and multivariate normality before running the analyses. Tests for the presence of multivariate outliers, conducted in AMOS 23, showed one case whose p-values for squared Mahalanobis distance (M-D) was less than .001 (Kline, 2011). Testing for multicollinearity, the results showed that the absolute values of all the inter-item correlations were below the required cutoff of .95 (Tabachnick & Fidell, 2007). Output, displayed in Table 3 from Analysis of Moments Structures (AMOS 23; Arbuckle, 2015), indicated that Shared Activities had a kurtosis value above 7 (kurtosis = 17.35) and a skewness with the absolute value above 2 (skewness = -3.80), indicating non-normality (Fabrigar, Wegener, MacCallum, & Strahan, 1999). In addition, the presence of multivariate non-normality was confirmed by the value of the critical ratio, which was greater than the required cutoff of ≤ 5 (critical ratio = 27.263; Bentler, 2005).

Similar to the EFA, a variety of transformations suggested by Tabachnick and Fidell (2007) for negatively skewed variables were examined. The reciprocal transformation was selected and applied to the variable Shared Activities as it provided the greatest impact on reducing skewness and kurtosis within acceptable univariate normality limits. However, despite the transformation, multivariate nonnormality was still not within acceptable normality limits based on the skewness of -2.04 (SE = .135) and kurtosis of 3.36 (SE = .269). Since neither the variable Shared Activities, nor its transformation met the normality assumption, the CFA was conducted using Mplus version 7 (Muthén &Muthén, 1998). This statistical package was choosen as it offers a choice of Robust Maximum Likelihood (MLR) estimation, which allows for statistically sound parameter estimates with standard errors that are robust to multivariate non-normality and multivariate outliers (Byrne, 2013).

Conditional PROCESS models. Before running the moderated mediation models, missing data was analyzed, assumptions were tested, and descriptive statistics using IBM SPSS Version 22 were conducted to summarize and profile all study variables. Categorical variables measured in non-metric scales were summarized in terms of proportions. Numerical variables measured in metric scales were summarized in terms of means and standard deviations. To improve interpretation of the resulting coefficients and their tests of significance, the parenting quality variables used as moderators were transformed and mean centered. Any statistically significant interactions will be probed using the pick-a-point approach automatically included in the PROCESS output, which also includes standard errors, p-values for a two-tailed test of the null hypothesis that the

moderator is equal to 0, and confidence intervals for each probed value. Mean and standard deviations for all variables of interest for this study can be found in Table 5.

Missing data. Missing data is expected to be of minimal concern due to low attrition rates across the five waves and because data was inputted directly into the database by interviewers. Each wave was analyzed for missing data to determine the final sample size used for analyses. In Wave 1, 387 families (a child and one of their caregivers) participated in the study and answered all survey questions. At W_2, 14 families dropped out of the study, and additionally, a child did not answer survey questions on involvement with deviant peers, resulting in a remaining 372 families. Statistical control variables were also reviewed at W_2 for missing data. Only family income had missing data (n = 14) and was removed from the data file, resulting in a remaining 358 families. At W_3, an additional three families dropped out of the study, and additionally, a total of 19 caregiver and child participants did not answer at least one of survey questions for predictor variables, resulting in a remaining 336 families. Last, at W_5, a total of 15 child participants did not answer survey questions relating to SU outcome variables, resulting in a final sample size of 321 families. Bivariate analyses were conducted to assess whether the families included in the final sample (N = 321) and the ones that either dropped out of the study or who were missing data (N = 66) were significantly different on any demographic variables at the baseline. Chi-square statistics were used for categorical variables, and t-test statistics were used for numerical variables. As shown in Table 4, only one of the tests—whether families received public assistance (PA)—showed statistically significant differences between them. The missing families are more likely to be receiving PA than the non-missing families. Therefore, the sample

prior to assumption testing is representative of the original sample on all demographic variables except for PA.

Assumption testing. After removing missing data, all study variables were tested to verify that the normal distribution assumptions have been met. Univariate descriptive statistics and frequency histograms were used in SPSS 22 to identify outliers and problematic levels of skewness and kurtosis. Involvement with deviant peers at W_2 and W_3 indicated a departure from normality. Involvement with deviant peers at W_2 showed skewness of 2.27 (SE = 0.14) and kurtosis of 6.16 (SE = 0.27). Involvement with deviant peers at W_3 showed skewness of 1.53 (SE = 0.14) and kurtosis of 1.53 (SE = 0.27). A variety of transformations suggested by Tabachnick and Fidell (2007) for positively skewed variables were examined. The square root (SQRT) transformation was selected as it provided the greatest impact on reducing skewness and kurtosis. The square root transformation of the involvement with deviant peers at W_2 has skewness of .80 (SE = 0.14) and kurtosis of .36 (SE = 0.27). The square root transformation of the involvement with deviant peers at W_3 has skewness of .63 (SE = 0.14) and kurtosis of .94 (SE = 0.27). Even though neither of the transformed variables has skewness and kurtosis within normality (i.e., both the ratio between the skewness and its standard error and the ratio between kurtosis and its error are no more than 1.96), they are much closer to normality.

All independent variables were standardized and examined for the presence of multivariate outliers, multivariate non-normality, and multicollinearity. For the convenience of data analysis, the large data file was organized into two separate data files, each of which has a different set of variables. The first one is for the models in which involvement with deviant peers was examined as a mediator. The second one is for

the models in which school connectedness was examined as the mediator. The test of multivariate outliers was conducted for each data file separately. Using the linear regression function in SPSS 22 to request Mahalanobis distances, the results showed that four cases in the first file and three cases in the second file were multivariate outliers, and therefore, were eliminated from each file respectively. Bias-corrected bootstrap confidence intervals found within PROCESS was the method that was utilized to address the possibility of multivariate non-normality. Bootstrapping procedures were selected as they have become the more widely recommended method for inference about the indirect effects in mediation analyses and are robust to multivariate non-normality (Hayes, 2013).

Model 14 in PROCESS (Hayes, 2013) uses the interaction term between each moderator and the mediator to test for moderation effects. Using this model, three hypotheses in Aim II were tested to determine if involvement with deviant peers at W_3 mediates the association between school connectedness at W_2 and (1) alcohol use initiation (AimII: H1), (2) cigarette use initiation (Aim II: H2), and (3) marijuana use initiation (Aim II: H3) at W_5. Additionally, Model 14 was used to test nine hypotheses in Aim IV to determine if each of the three parenting quality factors individually moderate the association between involvement with deviant peers at W_3 and alcohol use initiation (Aim IV-A: H1, Aim IV-B: H1, and Aim IV-C: H1), cigarette use initiation (Aim IV-A: H2, Aim IV-B: H2, and Aim IV-C: H2), and marijuana use initiation (Aim IV-A: H3, Aim IV-B: H3, and Aim IV-C: H3) at W_5. Each parenting quality factor was tested separately since Model 14 in PROCESS allows for only one moderator in each model. In addition, consistent with support from the previous research, each substance was modeled separately. Therefore, a total of nine different models were tested for this pathway.

Family SES, parents' marital status, youth age, youth biological sex, youth race/ethnicity, and SUI prior to W_3 were included as covariates in each model to regress on SUI.

Since the mediator is continuous, while the three SUI variables are binary, PROCESS uses ordinary least squares regression to model the mediator and uses logistic regression to model SUI (Hayes, 2013). Beta coefficients (β) for ordinary least squares regression and odds ratios (OR) for logistic regression were reported. The interpretation of OR is based on its value relative to 1. That is, an OR greater than 1 indicates a positive relationship and an OR less than 1 indicates a negative relationship.

V. RESULTS

Parenting Quality Measure

Exploratory factor analyses. The first hypothesis in Aim I (Aim I: H1) was not supported as the results of the EFA demonstrated that three factors—all of which had eigenvalues over Kaiser's (1960) criterion of 1 (Table 7)—are more appropriate for assessing parenting quality than the two factors that were hypothesized. Analysis of the inflection of the scree plot also confirmed retaining three factors (Figure 3). The output from the oblique rotation (with oblimin) produced a pattern matrix, which showed the unique contribution of each factor to the variance of each item. Items are standardized, ordered, and grouped by size to facilitate interpretation. Notably, all variables had standardized factor scores above the .32 minimum utilized in most social science research (Tabachnick & Fidell, 2007). The output from the pattern matrix is shown in Table 8.

The three-factor solution accounted for 59.6% of the total variance explained in Table 7. Factor one accounted for 31.5% of the total variance explained based on the following four items: parental monitoring, child disclosure, obligations to disclose, and

parent-child relationships and was named Parental Knowledge and Affective Relationships. Factor two accounted for 19.1% of the total variance explained based on the following four items: legitimacy of parental authority, parental efficacy, parental reactions to child alcohol use, and parental reactions to child cigarette use and was named Parental Control. Factor three accounted for 9% of the total variance explained based on the following four items: shared activities, parental solicitation, time spent with the child, and parental involvement with child and was named Parental Communication and Involvement. Also counter to expectations, warmth and control items loaded together, rather than separately, on two of the three factors (i.e., Parental Knowledge and Affective Relationships and Parental Communication and Involvement). Factor loadings were between 0.36 and 0.94 with no evidence of double-loading. Results from the factor correlation matrix indicated factor one and factor three were highly correlated ($r = .63$, $p < .05$).

After determining the best factor solution, psychometric properties of the retained factors were examined. The overall measure ($\alpha = 0.78$) and all individual factors demonstrated good internal consistency/reliability ($\alpha = 0.75$ for Factor 1, $\alpha = 0.72$ for Factor 2, and $\alpha = 0.71$ for Factor 3). Moreover, correlations between the three retained factors, and additional parent-report (parental control, parental depression, caregiver injury, and nicotine use) and child-report measures of parenting (parental demandingness) demonstrated satisfactory construct validity. As expected, parental control and parental demandingness were correlated with each of the three factors. As expected, parental depression, caregiver injury and conflict, and nicotine use were not correlated with the three factors. The only exception is that parental depression was negatively correlated

with Parental Communication and Involvement. Results for the convergent and discriminant validity tests are shown in Table 9.

Confirmatory factor analyses. A CFA was used to test whether the factor structure identified for the 12 parenting subscales in the EFA fits a similar sample. Accordingly, child disclosure, obligations to disclose, parental monitoring, and parent-child relationships were added as indicators to the first latent variable; reactions to cigarette use, reactions to alcohol use, legitimacy of parental authority, and parental efficacy were added as indicators to the second latent variable; and shared activities, parental solicitation, time spent with child, and parental involvement were added as indicators to the third latent variable. The loading for the first item of each factor was fixed to one. Given the correlation between Parental Knowledge and Affective Relationships and Parental Communication and Involvement from the EFA ($r = .63$), these factors were set to be correlated when specifying the CFA model.

The second hypothesis in Aim I (Aim I: H2) was supported as the results of the CFA indicated that the overall model fit was good utilizing the three-factor solution identified in the EFA. The CFA model with standardized coefficients is shown in Figure 4. Although the chi-square was significant (χ^2 (53) = 170, $p < .01$) as expected given the large sample size, the relative normed chi-square, the ratio of the χ^2 to the degrees of freedom (χ^2/df), equaled 3.2, which is less than 5, indicating a good model fit (Schumacker & Lomax, 2004). The CFI and TLI were 0.89 and 0.87 respectively, both indicating acceptable fit (Bentler & Bonnet, 1980). Last, the RMSEA equaled 0.08 which is the required cutoff for acceptable model fit (MacCallum et al., 1996). A summary of the model fit indices is shown in a note at the bottom of Figure 4.

All items loaded on the corresponding factors with no evidence of double-loading. All parameter estimates loaded in the expected direction and adequate size. The only factor loading value below the recommended cutoff of 0.30 was legitimacy of parental authority ($r = 0.26$) within the Parental Control factor. However, this is consistent with the estimates derived from the EFA results, in which Parental Control loaded on parental authority with a coefficient of 0.37. The loadings for all other variables were between 0.33 and 0.91. Consistent with the EFA results, Parental Knowledge and Affective Relationships and Parental Communication and Involvement were correlated ($r = .83$, $p < .05$). All parameters had a critical ratio greater than 1.96 or a p-value smaller than 0.05 signifying the parameter is statistically different from zero at the 0.05 significance level (Byrne, 2013).

Conditional Process Models

Bivariate correlations. Descriptive statistics for all study variables are shown in Tables 4 and 6. As expected, higher school connectedness at W_2 was associated with less involvement with deviant peers at W_3 and a lower likelihood of initiation for each of the three substances at W_5. Higher school connectedness at W_2 was also associated with higher levels of Parental Knowledge and Affective Relationships, while higher school connectedness at W_3 was associated with higher levels of Parental Knowledge and Affective Relationships and Parental Communication and Involvement at W_3. As expected, higher involvement with deviant peers at W_2 was associated with lower school connectedness at W_3 and a higher likelihood of initiation for each of the three substances at W_5. Higher involvement with deviant peers at W_2 and W_3 was also associated with lower levels of Parental Knowledge and Affective Relationships at W_3.

Regarding demographic variables, higher scores on the family SES composite variable at W_2 were associated with less involvement with deviant peers at both W_2 and W_3 and higher levels of school connectedness at W_3. Unexpectedly, increases in youth age were positively associated only with alcohol use initiation at W_5. Increases in youth age were also associated with less Parental Control at W_2. Non-married caregiver status at W_2 was associated with higher involvement with deviant peers at W_3, higher marijuana use initiation at W_5, lower school connectedness at W_2 and W_3, and lower Parental Control at W_3. Girls were associated with higher school connectedness at W_2 and W_3. Non-white youth were associated with higher levels of involvement with deviant peers at W_2 and W_3 higher marijuana use initiation, and lower school connectedness at W_3. As expected, all three control variables for prior W_3 SUI were positively associated with each other and prior W_3 alcohol, and cigarette use initiation was positively associated with all three W_5 SUI outcomes. Unexpectedly, prior W_3 marijuana use initiation was associated only with cigarette and marijuana use initiation at W_5.

Involvement with deviant peers as a mediating pathway. Detailed results of all models were presented in tables. In text, results were reported on the direct and indirect effects of school connectedness through involvement with deviant peers only for the first model of each substance, which tests Parental Knowledge and Affective Relationships as the moderator. Since the other two models for each substance are different from the first

model on only the parenting quality moderators in the last path, the slightly different direct and indirect effects results were not reported in the text.[1]

Alcohol use initiation.

Parental Knowledge and Affective Relationships as a moderator. This model fit significantly better than the constant only model (χ^2 (3, N = 316) = 82.34, p < .001; see the first column of Table 10). School connectedness did not have a direct effect on alcohol use initiation. However, school connectedness at W_2 negatively predicted involvement with deviant peers at W_3 (β = -.30, p < .001). In turn, involvement with deviant peers at W_3 positively predicted alcohol use initiation at W_5 (OR = 2.89, CI = .69 – 1.32). As expected (Aim II: H1), the indirect effect of school connectedness at W_2 on alcohol use initiation at W_5 through involvement with deviant peers at W_3 was significant. The indirect effect was calculated by multiplying the beta of the first path (a = -.30) by the beta of the second path (b = 1.06), and equals the value of -.32 (i.e., OR = 0.73). That is, for youth whose school connectedness is one *SD* higher than a reference group of youth, their odds of initiating alcohol use at W_5 were 0.73 times the odds for the reference group. Process reports the bias-corrected bootstrap confidence intervals (CI) of the interaction term at three values of the moderators: the moderator at the mean (CI = -.45 – -.17), one standard deviation above the mean (CI = -.49 – -.14), and one standard deviation below the mean (CI = -.49 – -.14). All the CIs were consistently below 0,

[1] Hayes (2013) Model 4, which tests for simple mediation, was also used to test the mediation effects of involvement with deviant peers on the relationship between school connectness and substance use initiation. The results were similar to the results found in Model 14.

indicating that the indirect effect of school connectedness on alcohol use initiation through involvement with deviant peers was significant.

Regarding the first-order effect of Parental Knowledge and Affective Relationships, it was not a statistically significant predictor of alcohol use initiation at W_5. Counter to expectations (Aim IV-A: H1), the interaction between Parental Knowledge and Affective Relationships and involvement with deviant peers was not statistically significant, indicating that Parental Knowledge and Affective Relationships at W_3 did not moderate the association between involvement with deviant peers at W_3 and alcohol use initiation at W_5. None of the covariates were significant; however, youth age at W_2 as a predictor of alcohol use initiation at W_5 approached the cutoff for statistical significance (b = .23, OR = 1.26, p = .08).

Parental Control as a moderator. This model fit significantly better than the constant only model (χ^2 (3, N = 316) = 81.35, p < .001; see the first column in Table 11). Regarding the first-order effect of Parental Control, it was not a statistically significant predictor of alcohol use initiation at W_5. Counter to expectations (Aim IV-B: H1), the interaction between Parental Control and involvement with deviant peers was not statistically significant, indicating that Parental Control at W_3 did not moderate the association between involvement with deviant peers at W_3 and alcohol use initiation at W_5. Youth age at W_2 was the only covariate that was a significant positive predictor of alcohol use initiation at W_5 (OR = 1.31, p < .05). That is, for youth whose age is one *SD* higher than a reference group of youth, their odds of initiating alcohol use at W_5 were 1.31 times the odds for the reference group.

Parental Communication and Involvement as a moderator. This model fit significantly better than the constant only model (χ^2 (3, N = 316) = 82.09, p < .001; see the first column in Table 12). Regarding the first-order effect of Parental Communication and Involvement, it was a significant negative predictor of alcohol use initiation at W_5 (OR = 0.91, p < .05). That is, for youth whose Parental Communication and Involvement is one *SD* higher than a reference group of youth, their odds of initiating alcohol use at W_5 was 0.91 times the odds for the reference group. Counter to expectations (Aim IV-C: H1), the interaction between Parental Communication and Involvement and involvement with deviant peers was not statistically significant, indicating that Parental Communication and Involvement at W_3 did not moderate the association between involvement with deviant peers at W_3 and alcohol use initiation at W_5. None of the covariates were significant; however, youth age at W_2 as a predictor of alcohol use initiation at W_5 approached the cutoff for statistical significance (b = .26, OR = 1.30, p = .06). In sum, results for the model with alcohol use initiation as the outcome variable support involvement with deviant peers as a significant mediator between school connectedness and alcohol use initiation, with no indication of statistically significant moderation related to parenting quality factors.

Cigarette use initiation.

Parental Knowledge and Affective relationships as a moderator. This model fit significantly better than the constant only model (χ^2 (3, N = 316) = 72.23, p < .001; see the second column of Table 10). School connectedness at W_2 had a significant direct effect on cigarette use initiation at W_5 (OR = 0.64, CI = -.83 – -.07). School connectedness at W_2 negatively predicted involvement with deviant peers at W_3 (β = -.30,

$p < .001$). In turn, involvement with deviant peers at W_3 positively predicted cigarette use initiation at W_5 (OR = 3.22, CI = .63 – 1.48). As expected (Aim II: H2), the indirect effect of school connectedness at W_2 on cigarette use initiation at W_5 through involvement with deviant peers at W_3 was significant. The indirect effect was calculated by multiplying the beta of the first path (a =-.30) by the beta of the second path (b = 1.17), and equals the value of -.35 (i.e., OR = .70). That is, for youth whose school connectedness is one *SD* higher than a reference group of youth, their odds of initiating cigarette use at W_5 were 0.70 times the odds for the reference group. Process reports the bias-corrected bootstrap confidence intervals (CI) of the interaction term at three values of the moderators: the moderator at the mean (CI = -.51 – -.15), one standard deviation above the mean (CI = -.65 – -.14), and one standard deviation below the mean (CI = -.46 – -.09). All the CIs were consistently below 0, indicating that the indirect effect of school connectedness on cigarette use initiation through involvement with deviant peers was significant.

Regarding the first-order effect of Parental Knowledge and Affective Relationships, it was not a statistically significant predictor of cigarette use initiation at W_5. Counter to expectations (Aim IV-A: H2), the interaction between Parental Knowledge and Affective Relationships and involvement with deviant peers was not statistically significant, indicating that Parental Knowledge and Affective Relationships at W_3 did not moderate the association between involvement with deviant peers at W_3 and cigarette use initiation at W_5. Prior W_3 cigarette use initiation was the only covariate that was a significant positive predictor of cigarette use initiation at W_5 (b = 2.00, OR = 7.39, $p < .05$). That is, for youth who reported smoking cigarettes prior to W_3 compared to a

reference group of youth who did not, their odds of initiating cigarette use at W_5 were 7.39 times the odds for the reference group. Youth race at W_2 (b = -1.06, OR = 0.35, p = .06) as a predictor of cigarette use initiation at W_5 approached the cutoff for statistical significance.

Parental Control as a moderator. This model fit significantly better than the constant only model (χ^2 (3, N = 316) = 64.77, p < .001; see the second column in Table 11). Regarding the first-order effect of Parental Control, it was not a statistically significant predictor of cigarette use initiation at W_5. Counter to expectations (Aim IV-B: H2), the interaction between Parental Control and involvement with deviant peers was not statistically significant, indicating that Parental Control at W_3 did not moderate the association between involvement with deviant peers at W_3 and cigarette use initiation at W_5. Prior W_3 cigarette use initiation was the only covariate that was a significant positive predictor for cigarette use initiation at W_5 (b = 2.24, OR = 9.39, CI = .52 – 3.98). That is, for youth who reported smoking cigarettes prior to W_3 compared to a reference group of youth who did not, their odds of initiating cigarette use at W_5 were 2.24 times the odds for the reference group. Youth race at W_2 (b = -1.06, OR = 3.35, p = .06) as a predictor of cigarette use initiation at W_5 approached the cutoff for statistical significance.

Parental Communication and Involvement as a moderator. This model fit significantly better than the constant only model (χ^2 (3, N = 316) = 66.58, p < .001; see the second column in Table 12). Regarding the first-order effect of Parental Communication and Involvement, it was not a statistically significant predictor of cigarette use initiation at W_5. Counter to expectations (Aim IV-C: H2), the interaction between Parental Communication and Involvement and involvement with deviant peers

was not statistically significant, indicating that Parental Communication and Involvement at W_3 did not moderate the association between involvement with deviant peers at W_3 and cigarette use initiation at W_5. Prior W_3 cigarette use initiation was the only covariate that was a significant positive predictor for cigarette use initiation at W_5 (b = 1.96, OR = 7.10, $p < .05$). That is, for youth who reported smoking cigarettes prior to W_3 compared to a reference group of youth who did not, their odds of initiating cigarette use at W_5 were 1.96 times the odds for the reference group. Youth race at W_2 (b = -1.12, OR = 0.33, p = .05) as a predictor of cigarette use initiation at W_5 approached the cutoff for statistical significance. In sum, results for the model with cigarette use initiation as the outcome variable support involvement with deviant peers as a significant mediator between school connectedness and cigarette use initiation, with no indication of statistically significant moderation related to parenting quality factors.

Marijuana use initiation.

Parental Knowledge and Affective Relationships as a moderator. This model fit significantly better than the constant only model (χ^2 (3, N = 316) = 90.23, $p < .001$; see the third column of Table 10). School connectedness did not have a direct effect on marijuana use initiation. However, school connectedness at W_2 negatively predicted involvement with deviant peers at W_3 (β = -.30, $p < .001$). In turn, involvement with deviant peers at W_3 positively predicted marijuana use initiation at W_5 (OR = 2.92, CI = .68 – 1.41). As expected (Aim II: H3), the indirect effect of school connectedness at W_2 on marijuana use initiation at W_5 through involvement with deviant peers at W_3 was significant. The indirect effect was calculated by multiplying the beta of the first path (a = -.30) by the beta of the second path (b = 1.07), and equals the value of -.32 (i.e., OR =

0.73). That is for youth whose school connectedness is one *SD* higher than a reference group of youth, their odds of initiating marijuana use at W_5 was 0.73 times the odds for the reference group. Process reports the bias-corrected bootstrap confidence intervals (CI) of the interaction term at three values of the moderators: the moderator at the mean (CI = -.48 – -.17), one standard deviation above the mean (CI = -.62 – -.17), and one standard deviation below the mean (CI = -.47 – -.14). All the CIs were consistently below 0, indicating that the indirect effect of school connectedness on marijuana use initiation through involvement with deviant peers was significant.

Regarding the first-order effect of Parental Knowledge and Affective Relationships, results approached the cutoff for statistical significance as a negative predictor of marijuana use initiation at W_5 (OR = 0.90, $p = .07$). Counter to expectations (Aim IV-A: H3), the interaction between Parental Knowledge and Affective Relationships and involvement with deviant peers was not statistically significant, indicating that Parental Knowledge and Affective Relationships at W_3 did not moderate the association between involvement with deviant peers at W_3 and marijuana use initiation at W_5. Prior W_3 marijuana use initiation ($b = 2.14$, OR = 8.34, $p < .05$) was the only covariate that was a significant positive predictor for marijuana use initiation at W_5. That is, for youth who reported smoking marijuana prior to W_3 compared to a reference group of youth who did not, their odds of initiating marijuana use at W_5 were 2.14 times the odds for the reference group.

Parental Control as a moderator. This model fit significantly better than the constant only model (χ^2 (3, $N = 316$) = 81.29, $p < .001$; see the third column in Table 11). Regarding the first-order effect of Parental Control, it was not a statistically significant

predictor of marijuana use initiation at W_5. Counter to expectations (Aim IV-B: H3), the interaction between Parental Control and involvement with deviant peers was not statistically significant, indicating that Parental Control at W_3 did not moderate the association between involvement with deviant peers at W_3 and marijuana use initiation at W_5. Prior W_3 marijuana use initiation was the only covariate that was a significant (b = 2.41, OR = 9.39, $p < .05$) positive predictor for marijuana use initiation at W_5. That is, for youth who reported smoking marijuana prior to W_3 compared to a reference group of youth who did not, their odds of initiating marijuana use at W_5 were 2.41times the odds for the reference group. Marital status at W_2 as a predictor of marijuana use initiation approached the cutoff for statistical significance (b = -.64, OR = 3.53, p = .10).

Parental Communication and Involvement as a moderator. This model fit significantly better than the constant only model (χ^2 (3, N = 316) = 80.39, $p < .001$; see the third column in Table 12). Regarding the first-order effect of Parental Communication and Involvement, it was not a significant predictor of marijuana use initiation at W_5. Counter to expectations (Aim IV-C: H3), the interaction between Parental Communication and Involvement and involvement with deviant peers was not statistically significant, indicating that Parental Communication and Involvement at W_3 did not moderate the association between involvement with deviant peers at W_3 and marijuana use initiation at W_5. Prior W_3 marijuana use initiation was the only covariate that was a significant (b = 2.24, OR = 11.02, $p < .05$) positive predictor for marijuana use initiation at W_5. That is, for youth who reported smoking marijuana prior to W_3 compared to a reference group of youth who did not, their odds of initiating marijuana use at W_5 were 2.24 times the odds for the reference group. In sum, results for the model with

marijuana use initiation as the outcome variable support involvement with deviant peers as a significant mediator between school connectedness and marijuana use initiation, with no indication of statistically significant moderation related to parenting quality factors.

School connectedness as a mediating pathway. Using model 14 in PROCESS (Hayes, 2013), three hypotheses in Aim III were tested to determine if school connectedness at W_3 mediates the association between involvement with deviant peers at W_2 and (1) alcohol use initiation (Aim III: H1), (2) cigarette use initiation (Aim III: H2), and (3) marijuana use initiation (Aim III: H3) at W_5. Additionally, Model 14 was used to test nine hypotheses in Aim V to determine if each of the three parenting quality factors individually moderate the association between school connectedness at W_3 and alcohol use initiation (Aim V-A: H1, Aim V-B: H1, and Aim V-C: H1), cigarette use initiation (Aim V-A: H2, Aim V-B: H2, and Aim V-C: H2), and marijuana use initiation (Aim V-A: H3, Aim V-B: H3, and Aim V-C: H3) at W_5. Like the involvement with deviant peers mediating pathway, each substance with each parenting quality factor was modeled and tested separately. Therefore, a total of nine different models were tested for this pathway. Family SES, parents' marital status, youth age, youth biological sex, youth race/ethnicity, and SUI prior to W_3 were also included as covariates in each model to regress on SUI.

Alcohol use initiation.

Parental Knowledge and Affective Relationships as a moderator. This model fit significantly better than the constant only model (χ^2 (3, N = 317) = 68.46, $p < .001$; see the first column of Table 13). Involvement with deviant peers at W_2 did have a direct effect on alcohol use initiation at W_5 (OR = 2.32, CI = .48 – 1.10). Involvement with deviant peers at W_2 negatively predicted school connectedness at W_3 (β = -.27, $p < .001$).

However, school connectedness at W_3 did not significantly predict alcohol use initiation at W_5. Counter to expectations (Aim III: H1), the indirect effects of involvement with deviant peers at W_2 on alcohol use initiation at W_5 through school connectedness at W_3 were not significant. Process reports the bias-corrected bootstrap confidence intervals (CI) of the interaction term at three values of the moderators: the moderator at the mean (CI = -.02 – .15), one standard deviation above the mean (CI = -.03 – .22), and one standard deviation below the mean (CI = -.07 – .14). All the CIs passed through one, indicating that the indirect effect of school connectedness on alcohol use initiation through involvement with deviant peers was not significant.

Regarding the first-order effect of Parental Knowledge and Affective Relationships, it is a statistically significant negative predictor of alcohol use initiation at W_5 (OR = 0.90, CI = -.19 – .02). That is, for youth whose Parental Knowledge and Affective Relationships is one *SD* higher than a reference group of youth, their odds of initiating alcohol use at W_5 was 0.90 times the odds for the reference group. Counter to expectations (Aim V-A: H1), the interaction between Parental Knowledge and Affective Relationships and school connectedness was not statistically significant, indicating that Parental Knowledge and Affective Relationships at W_3 did not moderate the association between school connectedness at W_3 and alcohol use initiation at W_5. Youth sex at W_2 was the only covariate that was significant as a positive predictor of alcohol use initiation at W_5 (OR = 1.80, $p < .05$). That is, for girls, their odds of initiating alcohol use at W_5 were 1.80 times the odds for boys.

Parental Control as a moderator. This model fit significantly better than the constant only model (χ^2 (3, $N = 317$) = 64.80, $p < .001$; see the first column in Table 14).

Regarding the first-order effect of Parental Control, it was not a statistically significant predictor of alcohol use initiation at W_5. However, in partial support of (Aim V-B: H1), there was evidence that Parental Control at W_3 (OR = 1.09, p = .07) approached the cutoff for statistical significance in moderating the association between school connectedness at W_3 and alcohol use initiation at W_5. In addition, a bias-corrected bootstrap CI for the index of moderated mediation, based on 10,000 bootstrap samples, just passed through zero (CI = -.060 – .001), further suggesting a marginal effect. None of the covariates were significant; however, youth age (b = .26, OR = 1.30, p = .05) at W_2 as a predictor of alcohol use initiation at W_5 approached the cutoff for statistical significance.

Parental Communication and Involvement as a moderator. This model fit significantly better than the constant only model (χ^2 (3, N = 317) = 64.38, p < .001; see the first column in Table15). Regarding the first-order effect of Parental Communication and Involvement, it approached the cutoff for statistical significance as a negative predictor of alcohol use initiation at W_5 (OR = 0.92, p = .09). Counter to expectations (Aim V-C: H1), the interaction between Parental Communication and Involvement and school connectedness was not statistically significant, indicating that Parental Communication and Involvement at W_3 did not moderate the association between school connectedness at W_3 and alcohol use initiation at W_5. None of the covariates were significant; however, youth age (b = .25, OR = 1.28, p = .06) and youth sex (b = .49, OR = 1.63, p = .08) at W_2 as predictors of alcohol use initiation at W_5 both approached the cutoff for statistical significance. In sum, school connectedness was not a significant mediator of the association between involvement with deviant peers and alcohol use

initiation and Parental Knowledge and Affective Relationships was not a significant moderator for this pathway.

Cigarette use initiation.

Parental Knowledge and Affective Relationships as a moderator. This model fit significantly better than the constant only model (χ^2 (3, N = 317) = 72.12, $p < .001$; see the second column of Table 13). Involvement with deviant peers at W_2 did have a direct effect on cigarette use initiation at W_5 (OR = 3.22, CI = .70 – 1.48). Involvement with deviant peers at W_2 negatively predicted school connectedness at W_3 (β = -.27, $p < .001$). However, school connectedness at W_3 did not significantly predict cigarette use initiation at W_5. Counter to expectations (Aim III: H2), the indirect effects of involvement with deviant peers at W_2 on cigarette use initiation at W_5 through school connectedness at W_3 were not significant. Process reports the bias-corrected bootstrap confidence intervals (CI) of the interaction term at three values of the moderators: the moderator at the mean (CI = -.19 – .12), one standard deviation above the mean (CI = -.38 – .09), and one standard deviation below the mean (CI = -.09 – .21). All the CIs passed through one, indicating that the indirect effect of school connectedness on cigarette use initiation through involvement with deviant peers was not significant.

Regarding the first-order effect of Parental Knowledge and Affective Relationships, it was not a statistically significant predictor of cigarette use initiation at W_5. Counter to expectations (Aim V-A: H2), the interaction between Parental Knowledge and Affective Relationships and school connectedness was also not statistically significant, indicating that Parental Knowledge and Affective Relationships at W_3 did not moderate the association between school connectedness at W_3 and cigarette use initiation

at W_5. Prior W_3 cigarette use initiation was the only covariate that was a significant (b = 2.70, OR = 14.88, $p < .01$) positive predictor of cigarette use initiation at W_5. That is, for youth who reported smoking cigarettes prior to W_3 compared to a reference group of youth who did not, their odds of initiating cigarette use at W_5 were 14.88 times the odds for the reference group. Youth race at W_2 approached the cutoff for statistical significance (b = -1.10, OR = 0.33, p = .08).

Parental Control as a moderator. This model fit significantly better than the constant only model (χ^2 (3, N = 317) = 60.89, $p < .001$; see the second column in Table 14). Regarding the first-order effect of Parental Control, it was not a significant predictor of cigarette use initiation at W_5. Counter to expectations (Aim V-B: H2), the interaction between Parental Control and school connectedness was also not statistically significant, indicating that Parental Control at W_3 did not moderate the association between school connectedness at W_3 and cigarette use initiation at W_5. Prior W_3 cigarette use initiation was the only covariate that was a significant (b = 2.61, OR = 13.46, $p < .01$) positive predictor of cigarette use initiation at W_5. That is, for youth who reported smoking cigarettes prior to W_3 compared to a reference group of youth who did not, their odds of initiating cigarette use at W_5 were 13.46 times the odds for the reference group.

Parental Communication and Involvement as a moderator. This model fit significantly better than the constant only model (χ^2 (3, N = 317) = 59.18, $p < .001$; see the second column in Table 15). Regarding the first-order effect of Parental Communication and Involvement, it was not a statistically significant predictor of cigarette use initiation at W_5. Counter to expectations (Aim V-C: H2), the interaction between Parental Communication and Involvement and school connectedness was also

not statistically significant, indicating that Parental Communication and Involvement at W_3 did not moderate the association between school connectedness at W_3 and cigarette use initiation at W_5. Prior W_3 cigarette use initiation was a significant (b = 2.70, OR = 14.88, $p < .01$) positive predictor of cigarette use initiation at W_5. That is, for youth who reported smoking cigarettes prior to W_3 compared to a reference group of youth who did not, their odds of initiating cigarette use at W_5 were 14.88 times the odds for the reference group. In sum, school connectedness was not a significant mediator of the association between involvement with deviant peers and cigarette use initiation and Parental Knowledge and Affective Relationships was not a significant moderator for this pathway.

Marijuana use initiation.

Parental Knowledge and Affective Relationships as a moderator. This model fit significantly better than the constant only model (χ^2 (3, N = 317) = 77.89, $p < .001$; see the third column of Table 13). Involvement with deviant peers at W_2 did have a direct effect on marijuana use initiation at W_5 (OR = 2.39, CI = .48 – 1.12). Involvement with deviant peers at W_2 negatively predicted school connectedness at W_3 (β = -.27, $p < .001$). However, school connectedness at W_3 did not significantly predict marijuana use initiation at W_5. Counter to expectations (Aim III: H3), the indirect effects of involvement with deviant peers at W_2 on marijuana use initiation at W_5 through school connectedness at W_2 were not significant. Process reports the bias-corrected bootstrap confidence intervals (CI) of the interaction term at three values of the moderators: the moderator at the mean (CI = -.06 – .15), one standard deviation above the mean (CI = -.14 – .16), and one standard deviation below the mean (CI = -.02 – .22). All the CIs

passed through one, indicating that the indirect effect of school connectedness on marijuana use initiation through involvement with deviant peers was not significant.

Regarding the first-order effect of Parental Knowledge and Affective Relationships, it was a statistically significant negative predictor of marijuana use initiation at W_5 (OR = 0.87, CI = -.23 – -.02). That is, for youth whose Parental Knowledge and Affective Relationships is one *SD* higher than a reference group of youth, their odds of initiating marijuana use at W_5 was 0.87 times the odds for the reference group. Counter to expectations (Aim V-A: H3), the interaction between Parental Knowledge and Affective Relationships and school connectedness was not statistically significant, indicating that Parental Knowledge and Affective Relationships at W_3 did not moderate the association between school connectedness at W_3 and marijuana use initiation at W_5. Prior W_3 marijuana use initiation was the only covariate that was a significant (b = 2.51, OR = 12.30, $p < .01$) positive predictor of marijuana use initiation at W_5. That is, for youth who reported smoking marijuana prior to W_3 compared to a reference group of youth who did not, their odds of initiating marijuana use at W_5 were 12.30 times the odds for the reference group. Marital status at W_2 as a negative predictor of marijuana use initiation approached the cutoff for statistical significance (b = -.70, OR = 0.50, p = .06).

Parental Control as a moderator. This model fit significantly better than the constant only model (χ^2 (3, N = 317) = 75.77, $p < .001$; see the third column in Table 14). Regarding the first-order effect of Parental Control, it was not a significant predictor of marijuana use initiation at W_5. However, in partial support of (Aim V-B: H3), there was evidence that Parental Control at W_3 (OR = 1.09, p = .09) approached the cutoff for

statistical significance in moderating the association between school connectedness at W_3 and marijuana use initiation at W_5. In addition, a bias-corrected bootstrap CI for the index of moderated mediation, based on 10,000 bootstrap samples, just passed through zero (CI = -.069 – .005), further suggesting a marginal effect. Marital status at W_2 was a significant (OR = 0.45, $p < .05$) negative predictor of marijuana use initiation at W_5. That is, for youth with married parents compared to a reference group of youth whose parents were separated or divorced, their odds of initiating marijuana use at W_5 were 0.45 times the odds for the reference group. In addition, prior W_3 marijuana use initiation a significant ($b = 2.93$, OR = 12.30, $p < .01$) positive predictor of marijuana use initiation at W_5. That is, for youth who reported smoking marijuana prior to W_3 compared to a reference group of youth who did not, their odds of initiating marijuana use at W_5 were 12.30 times the odds for the reference group.

Parental Communication and Involvement as a moderator. This model fit significantly better than the constant only model (χ^2 (3, $N = 317$) = 61.33, $p < .001$; see the third column in Table 15). Regarding the first-order effect of Parental Communication and Involvement, it was not a statistically significant predictor of marijuana use initiation at W_5. Counter to expectations (Aim V-C: H3), the interaction between Parental Communication and Involvement and school connectedness was also not statistically significant, indicating that Parental Communication and Involvement at W_3 did not moderate the association between school connectedness at W_3 and marijuana use initiation at W_5. Prior W_3 marijuana use initiation was the only covariate that was a significant ($b = 2.30$, OR = 9.97, $p < .01$) positive predictor of marijuana use initiation at W_5. That is, for youth who reported smoking marijuana prior to W_3 compared to a

reference group of youth who did not, their odds of initiating marijuana use at W_5 were 9.97 times the odds for the reference group. Marital status at W_2 as a negative predictor of marijuana use initiation at W_5 approached the cutoff for statistical significance (b = -.71, OR = 0.49, p = .06). In sum, school connectedness was not a significant mediator of the association between involvement with deviant peers and marijuana use initiation and Parental Knowledge and Affective Relationships was not a significant moderator for this pathway.

VI. DISCUSSION

Parenting Quality Measure

The first objective of this study was to develop a comprehensive and psychometrically sound measure of parenting quality. The results from the EFA and independent sample CFA were consistent and provided evidence for a three-dimensional structure for measuring parenting quality. The resulting three factors identified were: (1) Parental Control, (2) Parental Knowledge and Affective Relationships, and (3) Parental Communication and Involvement. Parental Control reflected parental reactions to youth's SU, as well as parents' beliefs about their abilities and authority to set rules. Parental Knowledge and Affective Relationships reflected parents' current knowledge of youth's activities gained through active monitoring and voluntary youth disclosure, as well as the quality of the parent-youth relationship. Parental Communication and Involvement reflected parents' attempts to solicit information from youth, as well as the frequency and type of involvement with their youth.

Psychometrics. Results offer support for strong psychometric properties of the parenting quality measure. The overall measure ($\alpha = 0.77$) and all individual factors (α

ranges from 0.71 to 0.75) demonstrated acceptable internal consistency. Assessment of convergent validity through correlations with theoretically sound measures was in the expected direction. One exception to these findings involved the correlation between Parental Control and the child-report of parental demandingness. Although significant ($p < .001$), this correlation ($r = .16$) was smaller than anticipated and may have been due to cross-reporter discrepancies (Abar, Jackson, Colby, & Barnett, 2015). Some studies suggest that parents' reports may be biased as they are likely to overestimate levels of certain parenting practices due to social desirability (Smetana et al., 2006). The highest correlations were found between the Parental Communication and Involvement factor and parental control, which prior work has theoretically framed as a dimension of warmth (Cablova, Csemy, Belacek, & Miovsky, 2016), indicating that involved parents who communicate effectively may also provide more discipline and rules in the home.

Findings related to discriminant validity tests were generally in the expected direction. However, one exception was a significant negative association ($r = -.13$, $p < .05$) between Parental Communication and Involvement and parental depression. Of the different factors, Parental Communication and Involvement is most likely to be impacted by parents' depression. For example, prior research demonstrates that mothers with depression tend to be less involved, exhibit higher levels of negative and critical communication, and have difficulty setting limits with their children (Middleton, Scott, & Renk, 2009). In fact, much of the prior work on parental depression focuses on how depressive symptomatology negatively affects parental involvement, also a warmth dimension, compared to parental solicitation, a control dimension (Elgar, Mills, McGrath, Waschbusch, & Brownridge, 2007). Perhaps anhedonia, the inability to feel pleasure

experienced by depressed parents, is expressed as limited time spent with their child doing shared activities, more so than reduced limit setting or monitoring.

Assessing parenting. Overall, the parenting literature has utilized a binary framework, suggesting that there are two main components of parenting: parental warmth/responsiveness and parental control/demandingness. Moreover, prior work has tended to view these parenting domains as separate and non-overlapping. For example, some researchers only assess the parental warmth domain, such as adolescent perceptions of interactions that are nurturing and supportive (Russell, & Gordon, 2017); whereas others focus solely on the parental control domain, such as how parents use disciplinary practices to gain knowledge of youth's activities (Wang, Stanton, Li, Cottrell, Deveaux, & Kaljee, 2013) and shape acceptable behavior (Barnes et al., 2006). Although some researchers have offered a typology to delineate how different patterns of parenting practices reflecting warmth and control can be combined to reflect overall parenting styles (Baumrind, 1991; Donaldson, Handren, & Crano, 2016; Minaie, Hui, Leung, Toumbourou & King, 2015), few examine the potential overlap across these two domains outside of a binary framework. Results from the current study indicate that two of the three parenting quality factors—Parental Knowledge and Affective Relationships and Parental Communication and Involvement—were loaded by both warmth *and* control related items, while the third factor—Parental control—was loaded by only control related items.

Parental Knowledge and Affective Relationships. Contrary to the Parental Control factor, loadings within the Parental Knowledge and Affective Relationships factor support more complexity as factor items were multidimensional, representing

aspects of control *and* warmth. Parental Knowledge and Affective Relationships items focus on important outcomes that can result from the quality of parent-youth relationships. For example, two important results of good parent-youth relationships are good interactions between parents and youth and knowledge of youth activities. Parental knowledge likely results from creating a warm and supportive environment where youth are more willing to disclose information to their parents voluntarily. Indeed, many of the items loading on this factor are focused on the results of parent-youth interactions, such as whether they achieve good relationships and, consequently, whether children are willing to disclose information about their lives to their parents. This association between parental knowledge of youth activities and the quality of parent-youth relationships may explain why the parental monitoring items loaded on Parental Knowledge and Affective Relationships instead of other disciplinary constructs under Parental Control. These findings are consistent with prior literature indicating that voluntary youth disclosure and parental knowledge may be facilitated in part by an open and trusting parent-youth relationship and strong emotional bonds (Fletcher, Steinberg, & Williams-Wheeler, 2004; Kerr et al., 2010).

Parental Communication and Involvement. The loadings within the Parental Communication and Involvement factor provided further evidence that an integrated conceptualization of assessing parenting may be more appropriate compared to a binary framework. Similar to Parental Knowledge and Affective Relationships, Parental Communication and Involvement factor items reflected control *and* warmth aspects of parenting. Items within this factor related to control asked about how often parents solicit information about youths' activities, their friends, and their friends' parents. Items related

to the warmth domain asked about the frequency of communication, type of activities parents are involved in with youth, and how much time parents spend with youth.

Results of the current study indicate that active parental solicitation may be more related to parental warmth than control, which could explain why there were no parental solicitation items that loaded on the Parental Control factor. Research indicates that parents who effectively communicate and are involved in shared activities are more comfortable soliciting information about their youths' whereabouts and activities (Ackard, Neumark-Sztainer, Story, & Perry, 2006; Lippold, Greenberg, Graham, & Feinberg, 2014). Additionally, parental solicitation may reflect an interest in bonding with youth that is characterized by mutual communication, rather than a one-sided interrogation to gain information about youth behaviors and whereabouts. Unlike the unidimensional nature of Parental Control, the combination of warmth and control items loading on Parental Communication and Involvement and Parental Knowledge and Affective Relationships offer support for an integrated framework of the parenting landscape.

Parental Control. Unlike Parental Knowledge and Affective Relationships and Parental Communication and Involvement, items that loaded onto this factor were limited to only aspects of control such as parental rules and discipline, parents' reactions to youth's use of substances, and parents' beliefs about their efficacy and authority to discipline youth. Moreover, items that loaded on this factor were categorized separately as either general control items or substance-specific control parenting practices. Yet, the overall parenting literature has tended to focus only on general control practices, such as the use of disciplinary practices to gain knowledge of youth activities (Wang et al., 2013)

and shape acceptable youth behavior (Barnes et al., 2006). Results indicated that substance-specific parenting practices loaded on the parental control domain. These items included discussions about the dangers of using substances, as well as setting and enforcing rules about youths' SU. Although these substance-use specific parenting practices have been examined in the smoking (de Leeuw, Scholte, Vermulst, & Engels, 2013) and alcohol use (Handley & Chassin, 2013) literature, few studies integrate general disciplinary practices with substance-use specific parenting practices in their assessments (Wang, Hipp, Butts, Jose, & Lakon, 2015). Doing so may provide a more accurate representation of the parenting context.

There are several reasons why these general and substance-use specific control items loaded onto the same Parental Control factor. First, both types of parenting practices shared a similar focus on controlling and shaping youth behavior. Second, parents with higher levels of efficacy and belief in their legitimate authority may be more likely to set and enforce rules. Prior studies have shown that parental efficacy influences parental competence and can play an essential role in enhancing parenting disciplinary practices (Dumka, Gonzales, Wheeler, & Millsap, 2010). Additionally, youths' belief in parents' authority over behaviors such as SU may also be indicative of parents' confidence in their efficacy, making them more likely to make rules and follow through on them. For example, adolescents were more likely to legitimize parental authority regarding SU issues (e.g., cigarette smoking, alcohol consumption) than contemporary (e.g., music, clothing) and conventional (e.g., religion, education) issues (Jackson, 2002). Our findings support the importance of including both components of parental control (i.e., general and substance use-specific) in a measure of parental quality.

Factor correlations. One possible concern with the three-factor solution was the high correlation between Parental Knowledge and Affective Relationships and Parental Communication and Involvement ($r = .63$, $p < .001$). While some overlap between these factors was expected, the strong association may bring into question the degree to which these factors are different. However, an important distinction emerges with a close examination of the items comprising each scale included in the individual factors. Items loading on to Parental Knowledge and Affective Relationships reflect two aspects of parent-child interactions: (1) youth-directed communication and (2) parental knowledge. Youth-directed communication is exemplified by items from two subscales (i.e., child disclosure and obligations to disclose). Youth-directed communication items included whether a youth talks about how they are doing in different subjects or if they are willing to disclose personal information (e.g., hanging out with friends and getting a bad grade in school). Parental knowledge items reflected knowledge regarding the whereabouts of youth and how they spend their free time. The high correlation between these two aspects of parenting — parental knowledge and child-directed communication — was not surprising given prior research by Stattin and Kerr (2000) who found that parental knowledge gained from voluntary child disclosure was more strongly correlated to youth problem behaviors than active tracking efforts and solicitation from parents (i.e., parental monitoring). The items loading on the Parental Knowledge and Affective Relationship factor appear to reflect how the quality of the parent-youth relationship influences the quality of parent-youth interactions and the amount of knowledge gained about their activities.

On the other hand, items loading onto Parental Communication and Involvement reflect two different aspects of parent-child interactions: mutual communication and spending time together. Unlike Parental Knowledge and Affective Relationships, where the communication was child-directed, this factor reflects more communication and discussions on more of an equal footing. Specifically, mutual communication and time spent together are ways parents and youth create their relationships with one another, as reflected by items that loaded onto this factor. First, mutual communication is exemplified by items from three of the scales that loaded on this factor (i.e., shared activities, parental involvement, and parental solicitation). For example, having discussions with their child about plans for the day, finding time to listen to their child, and having friendly chats with their child. Additionally, items also reflect having discussions with their child's friends and their parents. Second, spending time together is exemplified by items from two subscales (i.e., time spent with child and parental involvement) that loaded on this factor. For example, items reflect how much the parent spends talking and spending time with their child. The high correlation between these two aspects of parenting is consistent with work indicating that increased shared activities provide opportunities for bonding and fostering mutual communication (Crosnoe & Trinitapoli, 2008). Thus, analysis of individual items in Parental Knowledge and Affective Relationships and Parental Communication and Involvement supports distinct yet related aspects of each parenting factor, despite high correlations.

It is important to note that even though warmth and control dimensions of parenting should be considered distinct, they may be highly correlated. For example, Jacob and colleagues (2000) demonstrated that affect and control dimensions of parenting

had a strong and positive correlation (r = .54, p < .001). Similarly, results from Lac et al., 2009) indicated that the correlation between parental knowledge and parental warmth was high (r =.54, p < .001). In sum, these findings, and the results from the EFA provided support for a three-factor solution to best assess the parenting landscape.

Conditional Process Models

Ecological developmental models are useful for identifying how contextual risk and protective factors interact to influence SUI (Szapocznik & Coatsworth, 1999). Middle adolescence is a time when parenting influences play a critical role in youth development. Yet, little is known about how different dimensions of parenting may moderate the effect of other important contextual mechanisms (i.e., involvement with deviant peers and school connectedness) on SUI. In the initial part of this study, a comprehensive measure of parenting quality, comprised of three factors with robust psychometric properties, was developed. The second part of this study used a longitudinal design to investigate whether these parenting quality factors (i.e., Parental Knowledge and Affective Relationships, Parental Control, and Parental Communication and Involvement) in early adolescence (W_3) individually moderated the effect of two mediation pathways: (1) school connectedness at W_2 through involvement with deviant peers at W_3 on SUI (i.e., alcohol, cigarette, and marijuana) at W_5 and (2) involvement with deviant peers at W_2 through school connectedness at W_3 on SUI at W_5. Results did not support parenting quality factors as moderators. Involvement with deviant peers at W_3 mediated the relation between school connectedness at W_2 and each of the three SUIs at W_5 across all levels of parenting quality. However, school connectedness at W_3 was not a

significant mediator of the association between involvement with deviant peers at W_2 and any of the three SUIs at W_5.

Involvement with deviant peers as a mediating pathway. There was support for Aim II as results indicated that involvement with deviant peers at W_3 was a significant mediator of the association between school connectedness at W_2 and alcohol, cigarette, and marijuana use initiation at W_5. There are two reasons that may explain these findings. First, the school environment provides access to new peers, some of whom may be more deviant than neighborhood or family network peers. The significant amount of time spent in school settings during adolescence makes the school context especially prominent for understanding peer socialization (Vogel et al., 2015). Second, when students fail to have a meaningful connection to learning, they may tend to deviate from the prosocial expectations of parents and teachers and, consequentially, be more inclined to associate with deviant peers (Chun et al., 2013). In turn, involvement with deviant peers is associated with an increased risk of initiating alcohol (Trucco et al., 2011), cigarette (Van Ryzin et al., 2012), and marijuana (Schmits, Mathys, & Quertemont, 2015) use.

Prior research has demonstrated support for these findings. In two cross-sectional studies, one with Latino youth (Chun, Devall, & Sandau-Beckler, 2013) and another with European youth (Su & Supple, 2014), there was support for the role of negative peer influence as a mediator between school connectedness and SU outcomes. In addition, a two-year longitudinal study with primarily White youth (Mean age at baseline = 12.3), also showed that weak school attachment (Mean age = 12.9) was a significant predictor of involvement with friends who use substances (Mean age = 13.3), which, in turn, was a significant predictor of all three SU outcomes (Mean age = 14.3; Henry, 2008).

It is likely that students who feel disengaged from learning have less interest in developing meaningful relationships with supportive teachers and coaches who can provide a protective influence against deviant behavior (Chun et al., 2013; Su & Supple, 2014). Moreover, students who are disengaged academically may shift time, typically spent studying and attending class, to associating more with deviant peers, many of whom may be using substances. In turn, the more time disengaged students spend with substance using peers, the greater the likelihood that they will be pressured by their peers to use substances as well. In sum, these findings from prior work support that peer influences are a significant mediator of the association between school contexts and SUI.

There were some unexpected findings regarding the lack of statistically significant direct effects of school connectedness on SUI in the involvement with the deviant peers' mediating pathway. While prior research has shown that high levels of school connectedness were strongly related to delayed initiation of cigarette smoking, alcohol, and marijuana use (Chapman et al., 2013; Dornbusch, Erickson, Laird, & Wong, 2001), the results from this study showed that school connectedness was a statistically significant predictor only for low risk of cigarette use initiation (OR = 0.64, CI = -.831 – -.067). Perhaps students who are highly connected to their schools are more receptive to education, including public health messages on the harms of cigarette use, which may be more effective than those for other substances. The impact of public health messages on cigarette use is supported by MTF findings, which show that youth perceive cigarette use as more harmful than other substances such as alcohol and marijuana (Johnston et al., 2018).

Regarding parenting quality, there was no support for any of the hypotheses in Aim IV as results indicated that none of the three parenting quality factors moderates the relationship between deviant peers and any of the three SUIs within the mediation model testing deviant peers as a mediator of the relationship between school connectedness and SUIs. These results were unexpected as prior cross-sectional research with Australian youth (Chan, Kelly, Carroll, & Williams, 2017) and African American youth (Kung & Farrell, 2000) both revealed that the relation between deviant peer influences and SU increased as a function of poor parenting. Similarly, in a longitudinal study of primarily White youth, parental monitoring buffered the adverse effects of peer deviance, but only for alcohol abuse (Barnes et al., 2006). Considering that participants in this longitudinal study were also primarily White and that multiple substances were examined separately, it was surprising there were no significant results in any of the models that examined alcohol use initiation.

However, there are a few key differences between previous research and the current study that may explain the opposing results. First, Barnes et al. (2006) used youth reports for assessing parenting constructs, while the current study used parent reports. Prior research has shown that adolescents' reports tend to be more strongly predictive of youth behaviors than parents' reports and perhaps less biased (Kerr & Stattin, 2000). Second, Barnes et al. (2006) utilized multi-level growth curve models, while the current study examined each variable at only one-time point. Their multilevel growth curve models used parenting and peer variables measured at multiple time points, which may allow for a more accurate assessment of their influences on SUI over time (Barnes et al., 2006).

Yet, other studies have failed to find support for the moderating effect of parenting on deviant peer influences for SUI. In a study by Dorius, Bahr, Hoffmann, and Harmon (2004), which included fathers, closeness to the mother and parental support did not moderate the relationship between peer use and adolescent marijuana use. Additionally, prior work using the same sample of participants as the current study did not support parental demandingness or responsiveness as a moderator of the influence of peers on alcohol use initiation (Trucco et al., 2011). Even though this study used parenting measures different from the prior study (Trucco et al., 2011), similar null effects of parenting as a moderator were found.

Possible explanations for the null effects of the parenting quality factors as moderators in the current study needs further consideration. First, prior work has shown that the relevance and strength of some contextual risk and protective factors for SUI can change across developmental periods (Dodge et al., 2009; Masten, Faden, Zucker, & Spear, 2008). Dodge et al. (2009) developed a developmental model for the etiology of SUI that includes transactional relationships among children, parents, and peers. Their model posits that early parenting behaviors can increase the risk of children's later externalizing behaviors. These child behaviors can have an adverse effect on peer relationships, causing stress for the parent that can lead them to reduce protective parenting practices (e.g., monitoring, communication, and involvement) with the early-adolescent child. As parents withdraw over time from these protective practices, the middle-adolescent child is given more of an opportunity to become involved with deviant peers, and, in turn, increasing their odds of SUI.

In this study, parenting quality was assessed in early adolescence ($W_{3;}$ Mean age = 13.6) and at the same time point as involvement with deviant peers. Research indicates that parenting effects on SUI tend to wane and peer effects on SUI strengthen as youth seek more autonomy and the amount of time spent with peers increases (Atherton et al., 2015; Van Ryzin et al., 2012). Using a different model, in which parenting quality is assessed in an earlier developmental period (W_1; Mean Age = 11.6) and used as an exogenous variable rather than as moderating variable, may have resulted in significant direct effects on SUI and involvement with deviant peers. Perhaps the cascading, protective effects of parenting on reducing involvement with deviant peers, and, in turn, the odds of SUI, are more evident earlier in a child's development. Other studies offer support for a different mediational mechanism in which distal parenting factors and proximal peer factors contribute to SUI (Dishion, Patterson, & Griesler, 1994; Pires & Jenkins, 2007).

Second, the strength of involvement with deviant peers, as a predictor of SUI, may mask the effects of multicollinearity on the regression results of the individual parenting quality factors. Prior research has shown that peer relationships tend to have a stronger impact on behavior compared to parents in early adolescence (Akers & Cochran, 1985; Dorius et al., 2004). Moreover, peer influences (e.g., modeling SU, promoting attitudes that encourage SU, and exerting pressure to use substances) may be more proximal, while parenting influences may be more distal for SUI. Of these peer influences, peer pressure is perhaps the strongest and most proximal influence in that it entails specific and direct pressure in the moment of the peer interaction (Kung & Farrell, 2000). On the other hand, parenting influences may exert their weaker protective effects

against involvement with deviant peers and SUI earlier and more gradually over time (Kandel & Andrews, 1987; Bogenschneider et al., 1998).

Third, none of the prior literature supporting significant moderating effects for parenting utilized participants who were primarily White. Prior research has shown that cultural values and traditions found in different race and ethnicities may have a noticeable impact on parenting relationships (Romero & Ruiz, 2007). For example, a study by Moreno, Janssen, Cox, Colby, and Jackson (2017) found the influence of parent-adolescent relationship factors, such as social support and negative interactions on alcohol and marijuana use initiation, was greater for Latino than for White participants. In addition, research has shown that parenting may also be stronger in African American families. A study by Paschal, Lewis, and Sly (2007) found that African American parents held more conservative attitudes about SU than White parents do. Their results indicated that African American parents are less tolerant of underage drinking, less likely to allow youth to drink in their homes and were more likely to discipline their youth for using alcohol as compared to White parents (Paschal et al., 2007).

Last, the use of PROCESS (Hayes, 2013) limited each model to use only one domain of parenting quality. The moderation effects might have been significant when all three parenting domains, which is a more realistic assessment of overall parenting, are tested simultaneously. In sum, statistical package limitations, developmental considerations of assessing parenting quality at W_3, the strength of involvement with deviant peers as a positive predictor of SUI, and the characteristics of the current study participants and measures may be the significant factors contributing to the null effects of the parenting quality factors.

School connectedness as a mediating pathway. Aim III was not supported as results indicated that school connectedness at W_3 was not a statistically significant mediator of the association between involvement with deviant peers at W_2 and any SUI at W_5. These associations within this alternative mediating pathway have not been widely studied, but studies using similar constructs have shown a significant association between peer affiliations and school constructs on SUI. In a longitudinal study of German adolescents, class climate mediated the association between peer alcohol use and multiple adolescent alcohol use outcomes (Tomczyk et al., 2015). More specifically, adolescents who reported peer alcohol use at (Mean age = 10.3) also reported lower class climate (Mean age = 11.9), which, in turn, resulted in more current use, amount of use, and binge drinking (Mean age = 13.3; Tomczyk et al., 2015). Results from another longitudinal study found school belonging to mediate peer victimization and adolescent alcohol use (Wormington et al., 2016). More specifically, adolescents who reported peer victimization (Mean age = 13.5) also reported lower feelings of school belonging (Mean age = 14.6), which, in turn, resulted in more current and long-term alcohol use (Mean age = 15.8; Wormington et al., 2016).

There are several possible explanations for why the mediating pathway with school connectedness was not significant in the current study, while the pathway utilizing involvement with deviant peers was. First, involvement with deviant peers had a strong direct effect on each of the SUIs, which may mask the effects of multicollinearity on the regression results, making it more difficult to identify possible indirect effects. Second, as anticipated with a sample that is primarily White with high SES, there was little variance in the school connectedness scores (only 13% scored a 2 or lower out of a range from 1-

4), resulting in less of an opportunity to detect a statistical effect. Third, school connectedness is a broad construct that has been defined and measured differently throughout prior literature (Chapman et al., 2013). Those studies that demonstrated significant mediating effects utilizing school related constructs—class climate (Tomczyk et al., 2015) and school belonging (Wormington et al., 2016)—assessed different items than those in the school connectedness measure in this study. For example, class climate represented the contextual effects of the school environment (Tomczyk et al., 2015), while school connectedness in the current study measured an individual participant's interest in learning, feelings about teachers, and overall feelings about school. Perhaps contextual effects of school climate are more predictive of SUI than individual-level effects of school connectedness. In addition, Henry et al. (2009) attempted to disentangle the individual-level and contextual effects of school adjustment (i.e., school bonding, friend's school bonding, and behavior at school). Their results demonstrated a stronger contextual effect of school adjustment on alcohol use. Students who attended schools where the overall level of school adjustment was higher reported lower levels of alcohol use even after taking an individual level of school adjustment into account (Henry et al., 2009).

Results did not support the study hypotheses in Aim V as there was no evidence that any of the three parenting quality factors moderated the pathway between school connectedness at W_3 and the three SUIs at W_5. Even though only a few studies have examined parenting practices as a moderator of the association between school influences and SUI, the null effects for all three parenting moderators with all three substances were unexpected. A longitudinal study that examined alcohol use following the critical

transition from middle school to high school demonstrated that youth with parents high in parental monitoring were more likely to progress from light drinking to heavy drinking than youth whose parents were low in parental monitoring (Jackson & Schulenberg, 2013). School transitions may be a proxy for school connectedness as the challenges stemming from those transitions can create difficulties in adapting to a new environment that is often associated with both low school connectedness and increased risk for adolescent SUI (Seidman & French, 2004; Schulenberg, Patrick, Maslowsky, & Maggs, 2014).

In addition, cross-sectional results from a study of Danish youth indicated a moderating effect of parental smoking attitudes on the association between school connectedness and smoking behavior (Rasmussen et al., 2005). Considering that participants in this current longitudinal study were also primarily White and a similar measure was used to assess school connectedness and parental attitudes regarding youth smoking, it was surprising that this study showed that the moderation effects of Parental Control were not significant. One key difference between Rasmussen et al. (2005) and this study that may explain the opposite results was their use of youth reports to assess parental control items. Prior research has shown that youth reports tend to be more predictive of youth behaviors than parents' reports and perhaps less biased (Kerr & Stattin, 2000). Another difference worth noting was the use of a parenting moderator that was substance-specific in Rasmussen et al. (2005), while the moderator in the current study assessed both general parenting and substance-specific parenting practices. Perhaps the general parenting practices are overshadowing the predictive influence of the substance-specific parenting practices. Prior research has shown that substance use-

specific parenting may be a distinct and a more influential predictor of SUI than general parenting practices (Handley & Chassin, 2013)

No other studies were found that demonstrated null effects of parenting as a moderator of the association between school connectedness and SUI. However, other studies have shown these same null effects using constructs similar to school connectedness and SUI. For example, one study examined the protective effects of parenting during middle adolescence and demonstrated that parental disapproval of cigarette use did not act as a buffer against problems in school (e.g., skipping school, being sent out of, and absenteeism) on future smoking (Ellickson, Tucker, & Klein, 2008). Another study examining the buffering effects of parenting on the association between perceived discrimination at school (e.g., "Kids at school say bad things or make jokes about me because of my ethnic group") and SU found no support for parenting practices as a moderator (Kam & Cleveland, 2011).

In addition to the explanations for the null effects of the parenting quality factors in the involvement with deviant peers mediating pathway that were germane to the data set and statistical package (e.g., parent reports of parenting, White sample, and inclusion of only one parenting domain), there are two other possible explanations for the null effects specifically related to the school connectedness pathway. First, although involvement with deviant peers (W_2) was more distal, it remained a strong predictor of each SUI and may have masked the direct effects of school connectedness. Second, the strength of involvement with deviant peers may have limited the degree to which parenting quality factors positively impacted high levels of school connectedness. In sum, the strength of involvement with deviant peers as a positive predictor of SUI, the

characteristics of the current study participants, the parent study measures, and the limitation in PROCESS (Hayes, 2013) may be the significant factors contributing to the null effects of the parenting quality factors.

Limitations and Future Research

Despite the many strengths of the current study, some limitations and suggestions for future directions should be noted. These findings cannot be generalized to samples with different demographic characteristics, as the parents in this sample were primarily White (87%), with high levels of education and income. Future studies including more diverse participants are necessary. Only parent-report measures were examined, most of which (87%) were given by mothers. Research indicates that youth reports tend to be more strongly predictive of youth behaviors than parents' reports and perhaps less biased (Kerr & Stattin, 2000). Future studies should utilize parenting measures from multiple reporters (e.g., mothers, fathers, and youth). The proposed measure of parenting quality consists of 12 subscales, comprised of 139 individual items, which may be difficult to administer. Thus, future work that includes an individual item analysis to determine if some items could be eliminated, thus shortening the measure, could ease its administration. The current study used the measure of parenting quality only in early adolescence (W_3; Mean age = 13.6) and to examine moderation effects. Parenting may have a stronger impact on adolescent behavior at an earlier age, such as the decision to engage with a deviant peer group, thus still having an important role on risk for SUI that is not captured in the current model. Guided by developmental theory (Dodge et al., 2011), future research should attempt to capture when parenting is most influential on SUI. Additional studies are needed that utilize parenting measures at an earlier age to

examine whether parenting behaviors impact SUI indirectly through influencing their children's involvement with deviant peers and school connectedness.

The use of PROCESS for the statistical analyses precluded the inclusion of all parenting factors as moderators in the same model. Future studies should utilize statistical analyses in which the parenting factors can be examined simultaneously, such as structural equation modeling (SEM). Combining these parenting variables would provide a more a realistic view of the influence of parenting quality factors as potential buffers in the association between peer and school contexts on later SUI. In addition, SEM models would allow for the measurement model within the mediation model. Involvement with deviant peers was assessed using the adolescent's perception of how many of their friends engage in deviant behavior. Prior research has shown that when peer reports are obtained, effects on adolescent behavior tend to be smaller (Bauman & Ennett, 1996) as youths' reports often overestimate the frequency of their peers' deviant behaviors such as SU (Prinstein & Wang, 2005).

Similarly, the measure of school connectedness may be subject to bias as it was limited to youth-report. Future research should utilize multiple reporters, including parents and teacher to minimize shared method variance. In addition, school connectedness represents only one aspect of the school context that is predictive of risk for future SUI (Flay, 2000). Additional measures of school success (e.g., academic achievement) were not available and would have added to this study. Future research should utilize additional school-related constructs. Last, SUI outcome variables were based on self-report. While self-report is the norm in most prevention studies, it is nevertheless subject to bias from both over and underreporting (Williams & Nowatzki,

2005). Future studies should utilize secondary procedures (e.g., urine or hair follicle testing) to improve the reliability of the SUI findings.

VII. CONCLUSIONS

This study extends the literature through developing a comprehensive and integrative measure of parenting quality as well as testing how contextual factors predict SUI through different pathways. This study examined multiple measures of parenting and identified three factors (i.e., Parental Knowledge and Affective Relationships, Parental Control, and Parental Communication and Involvement) that may be most relevant to parenting. Findings indicate that warmth and control are overlapping aspects of parenting as opposed to binary constructs. Findings also support that substance use-specific parenting practices are part of parenting control.

Additionally, contexts known to be associated with SUI in middle adolescence—involvement with deviant peers, school connectedness, and parenting quality variables—were measured in sequence at different time points for testing different moderated mediations, albeit separate statistical models. This study added further support for the strength of involvement with deviant peers as a direct predictor and mediating pathway for initiation of all three substances examined. Last, although this study did not support school connectedness as a significant mediating pathway, the model of cigarette use initiation showed a hypothesized relationship in between each two of the three variables. Specifically, involvement with deviant peers is negatively associated with school connectedness, and school connectedness is negatively associated with cigarette use initiation.

Implications for Social Work

The results of this study suggest several implications for social work and interdisciplinary practice and policy. First, recognizing the importance that strong connections to school have on preventing involvement with deviant peers, social workers should utilize both micro level (i.e., individual clients) and macro level (i.e., school-wide) interventions that bolster students' connection to their school. These programs should target ways of improving students' interest in their academic success and ways to bond with their teachers, other important school personnel, and even prosocial peers. Failure to focus on the school context can leave students more vulnerable to the strong influence of deviant peers, and, in turn, to the risk of early SUI. Second, based on the strong direct and indirect influence that involvement with deviant peers has on SUI, social workers should also utilize individual micro and macro interventions to teach students skills relating to resisting deviant peers, while developing positive and healthy peer relationships. These programs should include involvement with supportive school personnel (e.g., teachers and coaches) to help minimize the risk of their students becoming involved with deviant peers and being at greater risk for SUI.

Third, despite the null moderation effects of each of the parenting quality factors, social workers should provide psychoeducation to parents to help them understand the risk factors (e.g., low self-esteem, parent-youth conflicts) that encourage youth to affiliate with deviant peers. This awareness may help motivate parents to learn skills for improving their relationships with their youth, while also helping to increase their self-esteem. In addition, recognizing that general parenting practices may not be as effective in buffering the negative effects of involvement with deviant peers or low school

connectedness, interventions may need to include education and skills training for more specific aspects of parenting. Last, overall results from the parent ADFP study indicated that many of the respondents had already begun experimenting with substances by the sixth grade (ages 11-12), a finding that supports NIDA's (2016) call for early prevention. As a result, social workers need to advocate for interventions—beginning in preschool and continuing through high school—that provide a consistent continuum of prevention skills for developing healthy peer relationships and bolstering school connectedness. Making sure that both critical contexts are included in interventions can help prevent early SUI and the consequences associated with later SUDs.

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Table 1

Youth Caregiver and Peer Caregiver Wave 3 Demographic Comparisons

	Youth Caregiver (*N* = 370)	Peer Caregiver (*N* = 326)		
Demographic Variables	*N* (%)/ Mean (S.D.)	*N* (%)/ Mean (S.D.)	Chi-Square/T-tests	p-value
Caregiver Sex:			2.928	.087
Male	48 (13%)	29 (9%)		
Female	322 (87%)	297 (91%)		
Youth Sex:			3.012	.091
Male	167 (45%)	141 (43%)		
Female	203 (55%)	185 (57%)		
Marital Status:			5.800	.215
Married	278 (75%)	249 (76%)		
Divorced/ Separated	56 (15%)	38 (12%)		
Single/Never Married	28 (8%)	23 (7%)		
Widowed	3 (1%)	4 (1%)		
Living with a Partner	5 (1%)	12 (4%)		
Education Level:			5.124	.528
Some High School	12 (3%)	7 (2%)		
High School Graduate/ Some College	143 (37%)	125 (38%)		

College Graduate:	133 (40%)	127 (39%)		
Graduate/ Professional School	82 (20%)	67 (21%)		
Public Assistance:			.485	.486
Yes	46 (12%)	35 (11%)		
No	324 (88%)	291 (89%)		
Hispanic/Ethnicity:			2.234	.135
Yes	6 (2%)	11 (3%)		
No	364 (98%)	315 (97%)		
Race Identity:			1.741	.783
White	323 (87%)	287 (88%)		
African American	33 (9%)	29 (9%)		
Other	14 (4%)	10 (3%)		
Age:				
Caregiver	44.9 (6.185)	44.35 (6.540)	1.132	.258
Youth	13.6 (.585)	13.6 (1.09)	-.301	.763
Annual Family Income	83,662/ (62,643)	88,246/ (67,301)	.903	.367

Table 2

Measures, Sample Questions, and Reliability

Item Name	Sample Questions	Cronbach Alpha (α)
Parental Monitoring	Do you know what your child does during his/her free time?	α = .74
	Do you know who your child has as friends during his/her free time?	
Child Disclosure	Does your child talk at home about how he/she are doing in the different subjects in school?	α = .76
	Does your child usually tell how school was when he/she gets home (how they did on different exams, they're relationships with teachers, etc.)?	
Parental Solicitation	In the last month, have you talked with the parents of your child's friends?	α = .67
	How often do you talk with your child's friends when they come to your home (ask what they do or what they think and feel about different things)?	
Shared Activities	When was the last time that you discussed with your child his/her plans for the coming day?	α = .78
	In the past six months about how often have you discussed with your child his/her plans for the coming day?	

Item Name	Sample Questions	Cronbach Alpha (α)
Parental Involvement with the Child	Do you find time to listen to your child when he/she wants to talk to you?	α = .64
	Do you and your child do things together at home?	
Time Spent with the Child	On the average, how much time each day are you together with your child on weekdays, that is, when you and your child are both awake?	α = .80
	On weekdays, how much of that time are you doing something together, like making something, playing a game, talking, or going out together	
Positive Parenting	In the past six months, when your child did something that you liked or approved of, how often did you…	α = .73
	Not say anything about it, or ignore it? Give him/her a wink or smile?	
Parent-child Relationships	Thought your child was a good kid? Felt proud of him/her?	α = .80
Curfew	Does your child have a set time to be home on school nights?	α = .69
	Does your child have a set time to be home on weekend nights?	

Item Name	Sample Questions	Cronbach Alpha (α)
Parental Efficacy	How confident are you that you can keep your child away from the wrong kinds of kids?	α = .89
	Prevent your child from using drugs?	
Parental Reactions to Cigarette Use	If you knew your child smoked or tried smoking, how likely is it that you would:	α = .75
	Feel proud.	
	Feel OK about it.	
Parental Reactions to Alcohol Use	If you knew your child drank alcohol or tried alcohol, how likely is it that you would:	α = .76
	Feel proud.	
	Feel OK about it.	
Obligations to Disclose	Without you asking, how often does your child tell you or is willing to tell you about the following things?	α = .88
	Hanging out at a friend's when no adult is home.	
	How teens spend their own money.	

Item Name	Sample Questions	Cronbach Alpha (α)
Legitimacy of Parental Authority	It is ok for me to make rules about…	α = .90
	What my child does after school.	
	Who my child's friends are.	
Parental Demandingness	How much do you agree or disagree with each sentence?	α = .66
	My parent really expects me to follow family rules.	
	My parent really lets me get away with things.	
Parental Control	Do you give your child permission to stay out late on a weekday evening?	α = .66
	Before your child goes out on a Saturday night, do you require him/her to tell them where he/she is going and with whom?"	
Parental Depression	In the past month, were you bothered by things?	α = .91
	Did you feel depressed?	
Caregiver Injury	How many times they accused their partner of being a lousy lover	α = .75

Item Name	Sample Questions	Cronbach Alpha (α)
	Threatened to hit or throw something at their partner.	
Current Nicotine Use	At present, do you find it difficult to refrain from smoking in places where it is forbidden?	α = .70
	At present, do you smoke more frequently during the first hours after waking than during the rest of the day?	
School Connectedness	You feel close to people at your school.	α = .75 (W_2)
	The teachers at your school treat students fairly.	α = .81 (W_3)
Involvement with deviant peers	Adolescents reported on perceived peer deviance among their three closest friends with items such as theft, school truancy, and physical aggression.	α = .81 (W_2) α = .87 (W_3)
Substance Use Initiation	Have you EVER used alcohol beverages such as beer, wine, wine coolers, or hard liquor without your parents' permission (even just a few sips)?	*

Note. * = Cronbach's alpha was not applicable as SUIs were based on one question.

Table 3

Assessment of Multivariate Normality

Variable	Min	Max	Skew	Critical ratio	Kurtosis	Critical ratio
Shared Activities	-6.499	.395	-3.798	-27.996	**17.346**	63.930
Parental Solicitation	-3.037	1.380	-.506	-3.730	-.143	-.529
Time Spent with Child	-3.387	1.807	-.845	-6.226	.689	2.540
Parental Involvement	-4.324	.777	-1.542	-11.365	2.541	9.365
Parental Reactions to CU	-3.474	2.027	-.274	-2.022	-.453	-1.671
Parental Reactions to AU	-3.137	2.372	-.483	-3.563	-.156	-.574
Parental Authority	-4.160	1.580	-.608	-4.485	.401	1.479
Parental Efficacy	-3.490	1.663	-.722	-5.325	.334	1.229
Child Disclosure	-3.114	1.412	-.434	-3.198	-.415	-1.531
Obligations to Disclose	-2.361	2.013	-.043	-.320	-.713	-2.629
Parental Monitoring	-5.047	1.313	-1.101	-8.114	1.981	7.302
Parent-Child Relationships	-4.918	1.033	-1.805	-13.303	4.682	17.256
Multivariate					55.356	**27.263**

Table 4

Missing Data Wave One Demographic Comparisons

	Sample ($N = 335$)	Missing Data ($N = 52$)		
Demographic Variables	*N* (%)/Mean (S.D.)	*N* (%)/Mean (S.D.)	Chi-Square/ T-test	*p*-value
Caregiver Sex:			.803	.370
Male	42 (13.1%)	6 (9.1%)		
Female	279 (86.9%)	60 (90.9%)		
Youth Sex:			.008	.930
Male	144 (44.9%)	30 (45.5%)		
Female	177 (55.1%)	36 (54.5%)		
Marital Status:			4.662	.324
Married	247 (76.9%)	45 (68.2%)		
Divorced	40 (12.5%)	9 (13.6%)		
Single/ Never Married	27 (8.4%)	11 (16.7%)		
Widowed	2 (.06%)	0 (0.0%)		
Living with a Partner	5 (1.6%)	1 (1.5%)		
Education Level:			3.143	.678
Some High School	8 (2.5%)	3 (4.5%)		

High School Graduate	43 (13.4%)	12 (18.2%)		
Technical School	10 (3.1%)	1 (1.5%)		
Some College	71 (22.2%)	14 (21.2%)		
College Graduate	121 (37.8%)	26 (39.4%)		
Graduate School	67 (20.9%)	10 (15.2%)		
Public Assistance:			6.139	.013
Yes	15 (4.7%)	9 (13.6%)		
No	305 (95.3%)	57 (86.4%)		
Child's Race:			7.277	.201
Caucasian	272 (85%)	49 (74.2%)		
African American	28 (8.8%)	7 (10.6%)		
American Indian	1 (.03%)	0 (0.0%)		
Hispanic	6 (1.9%)	2 (3.0%)		
Asian/Pacific Islander	3 (.09%)	1 (1.5%)		
Other	10 (3.1%)	7 (10.6%)		
Age:				
Caregiver	42.79 (6.33)	41.41 (5.84)	-1.637	.103
Youth	11.58 (.543)	11.73 (.542)	2.018	.064
Annual Family Income	81,498 (55,324)	80,283 (74,248)	-.140	.889

Table 5

Descriptive Statistics for Study Variables

Variable	Mean/(*N*)	*SD*/(%)
Family SES (W_2)	0.00	0.57
Youth Age* (W_2)	12.6	0.57
Marital Status (W_2)	1.37	0.77
Youth Sex (W_2)	1.56	0.50
Youth Race (W_2)	4.92	0.46
Alcohol use initiation (prior W_3)	Yes (45)	14
	No (277)	86
Cigarette use initiation (prior W_3)	Yes (17)	.05
	No (306)	95
Marijuana use initiation (prior W_3)	Yes (6)	.02
	No (311)	98
School connectedness* (W_2)	3.46	0.37
Involvement with deviant peers* (W_2)	0.76	0.89
School connectedness* (W_3)	3.44	0.42
Involvement with deviant peers* (W_3)	0.95	1.05
Parental Knowledge and Affective Relationships†	0.00	3.01
Parental Control†	0.00	2.91
Parental Communication and Involvement†	0.00	2.90
Alcohol use initiation (W_5)	Yes (150)	47

Variable	Mean/(*N*)	*SD*/(%)
	No (167)	53
Cigarette use initiation (W_5)	Yes (50)	16
	No (267)	84
Marijuana use initiation (W_5)	Yes (71)	23
	No (246)	77

Note. Family SES is a composite variable (i.e., family income, public assistance income, and parent education) standardized for analyses; * = Unstandardized values for variables that were standardized for analyses. Involvement with deviant peers W_2 and W_3 underwent a square root (SQRT) transformation; † = Parenting quality moderating variables were standardized and mean centered for analyses.

Table 6

Study Variable Bivariate Correlations

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. FSES	--																	
2. YAge	.04	--																
3. MS	**.27**	.04	--															
4. YSex	.05	.10	.06	--														
5. YRace	**-.14**	-.05	**-.34**	-.01	--													
6. PAUI	-.08	**.15**	-.10	.07	**.12**	--												
7. PCUI	-.10	.02	**-.18**	.07	.02	**.44**	--											
8. PMUI	-.01	.06	-.03	.03	**.21**	**.23**	**.48**	--										
9. DPW_3	**-.12**	**.13**	**-.27**	-.01	**.17**	**.36**	**.30**	**.22**	--									
10. SCW_2	.11	-.04	**.19**	**.20**	-.09	-.07	-.10	**-.15**	**-.30**	--								
11. SCW_3	**.21**	-.06	**.23**	**.18**	**-.11**	-.10	-.10	-.01	**-.34**	**.60**	--							
12. DPW_2	**-.12**	.11	**-.22**	-.06	**.17**	**.49**	**.29**	**.30**	**.58**	**-.25**	**-.27**	--						
13. PKR	.01	-.07	.10	**.13**	-.03	**-.11**	-.06	-.09	**-.21**	**.14**	**.20**	**-.14**	--					
14. PC	**-.12**	**-.12**	**-.11**	.01	.11	.04	.08	.05	.03	-.05	-.06	.06	**.13**	--				
15. PCI	-.01	.02	.06	.04	.07	-.10	-.01	-.03	-.07	.09	**.16**	-.11	**.56**	.09	--			
16. AUI	.02	**.16**	-.07	.06	.04	**.23**	**.13**	.10	**.46**	**-.12**	**-.17**	**.32**	**-.17**	-.01	**-.12**	--		
17. CUI	-.05	.05	-.11	.06	-.02	**.28**	**.34**	**.19**	**.41**	**-.22**	**-.13**	**.40**	**-.13**	-.05	-.08	**.40**	--	
18. MUI	-.03	.11	**-.20**	-.10	**.11**	**.32**	**.23**	**.26**	**.47**	**-.24**	**-.20**	**.39**	**-.20**	-.02	-.03	**.43**	**.60**	--

Note. FSES = Composite Family socioeconomic status; YAGE = Youth age; MS = Current caregiver marital status; YSex = Youth sex; YRace = Youth race; PAUI = Youth alcohol use initiation prior to W_3; PCUI = Youth cigarette use initiation prior to W_3; PMUI = Youth marijuana use initiation prior to W_3; DP W_3 = Involvement with deviant peers at W_3; DPW_2 = Involvement with deviant peers at W_2; SCW_2 = School connectedness at W_2; SCW_3 = School connectedness at W_3; PKR = Parental Knowledge and Affective Relationships at W_3, PC = Parental Control at W_3, and PCI = Parental Communication and Involvement at W_3; AUI = Alcohol use initiation at W_5, CUI = Cigarette use initiation at W_5, and MUI = Marijuana use initiation at W_5.; Bold values represent significant ($p < .05$) associations.

Table 7

Total Variance Explained

Component Number	Initial Eigenvalues	% of Variance	Cumulative %
1	**3.781**	**31.509**	**31.509**
2	**2.288**	**19.067**	**50.576**
3	**1.080**	**8.997**	**59.573**
4	.843	7.023	66.595
5	.768	6.399	72.995
6	.738	6.152	79.147
7	.660	5.498	84.643
8	.524	4.367	89.010
9	.488	4.069	93.078
10	.423	3.526	96.604
11	.289	2.408	99.011
12	.119	.989	100.000

Table 8

Pattern Matrix

Item	Factor 1- Parental Knowledge and Affective Relationships (PKAR)	Factor 2- Parental Control (PC)	Factor 3- Parental Communication and Involvement (PCI)
Child Disclosure	**.954**	-.017	-.097
Obligations to Disclose	**.667**	.108	.043
Parental Monitoring	**.627**	.102	.133
Parent-Child Relationships	**.350**	-.174	.053
Parental Reactions to Cigarette Use	-.093	**.940**	-.136
Parental Reactions to Alcohol Use	-.104	**.907**	-.024
Legitimacy of Parental Authority	.127	**.370**	.210
Parental Efficacy	.227	**.360**	.097
Shared Activities	-.071	-.098	**.668**
Parental Solicitation	.123	.096	**.611**
Time Spent with Child	-.023	.100	**.540**
Parental Involvement with Child	.220	-.121	**.512**

Table 9

Construct Validity

Validity Type/Item	Factor One-Parental Knowledge and Affective Relationships (PKAR)	Factor Two-Parental Control (PC)	Factor Three-Parental Communication and Involvement (PCI)
Convergent:			
Parental Control	.278***	.264***	.317***
Parental Demandingness	.190***	.165***	.217***
Discriminant:			
Parental Depression	-.068	-.017	-.110*
Caregiver Injury	.036	-.072	.105
Current Nicotine Use	-.051	.019	-.034

Note: * = $p < .05$, ** = $p < .01$, *** = $p < .001$

Table 10

Moderated Mediation Using Involvement with Deviant Peers as The Mediator and Parental Knowledge and Affective Relationships as The Moderator

	Model One (AUI)			Model Two (CUI)			Model Three (MUI)		
	Regression on PD			Regression on PD			Regression on PD		
Variables:	β	SE		β	SE		β	SE	
SC	-.30***	.05		-.30***	.05		-.30***	.05	
	Regression on AUI			Regression on CUI			Regression on MUI		
	β	SE	Exp (β)	β	SE	Exp (β)	β	SE	Exp (β)
Family SES	.17	.13	1.19	.03	.17	1.03	.20	.16	1.22
Youth Age	.23†	.13	1.26	-.06	.17	0.94	.17	.16	1.19
Not Married (reference: married)	.11	.35	1.12	-.19	.43	0.83	-.56	.39	0.57
Girls (reference: boys)	.33	.27	1.39	.64†	.38	1.90	-.45	.33	0.64
Nonwhite (reference: white)	-.14	.41	0.87	-1.06†	.56	0.35	.04	.46	1.04
AUI Prior to W_3	.53	.46	1.70						
CUI Prior to W_3				2.00**	.85	7.39			
MUI Prior to W_3							2.14**	8.34	8.50
SC direct effects	.01	.14	1.01	-.45*	.19	0.64	-.26	.16	0.77
SC indirect effects mediated by PD									
1 *SD* Below	-.32	.09	0.73	-.28	.10	0.76	-.29	.09	0.75
Mean	-.31	.07	0.73	-.35	.10	0.70	-.32	.08	0.73
1 *SD* Above	-.31	.09	0.73	-.41	.13	0.66	-.35	.11	0.70
PD	1.06***	.16	2.89	1.17***	.21	3.22	1.07***	.19	2.92
PKAR direct effects	-.08	.04	0.92	-.10	.07	0.90	-.11†	.06	0.90
Interaction (PD x PKAR)	-.01	.05	0.99	.07	.06	1.07	.03	.06	1.07
-2LL	356.22			210.69			253.51		
Log likelihood	82.34			72.23			90.23		
p-value	<.001			<.001			<.001		
McFadden R^2	.18			.24			.27		
Cox & Snell R^2	.23			.19			.25		
Nagelkerke R^2	.31			.33			.38		

Note. * = $p < .05$, *** = $p < .001$, and †= $p \leq .10$; AUI = Alcohol use initiation, CUI = Cigarette Use Initiation, and MUI = Marijuana use initiation; PD = Involvement with deviant peers; SC = School connectedness; PKAR = Parental knowledge and affective relationships.

Table 11

Moderated Mediation Using Involvement with Deviant Peers as the Mediator and Parental Control as the Moderator

	Model One (AUI)			Model Two (CUI)			Model Three (MUI)		
	Regression on PD			Regression on PD			Regression on PD		
Variables:	β	SE		β	SE		β	SE	
SC	-.30***	.05		-.30***	.05		-.30***	.05	
	Regression on AUI			Regression on CUI			Regression on MUI		
	β	SE	Exp (β)	β	SE	Exp (β)	β	SE	Exp (β)
Family SES	.16	.14	1.17	.03	.17	1.03	.19	.16	1.21
Youth Age	.27*	.14	1.31	-.07	.17	0.93	.19	.16	1.21
Not Married (reference: married)	.02	.35	1.02	-.26	.43	0.77	-.64†	.39	0.53
Girls (reference: boys)	.25	.27	1.28	.63†	.38	1.88	-.53	.33	0.59
Nonwhite (reference: white)	-.13	.40	0.88	-1.06†	.56	0.35	.04	.46	1.04
AUI Prior to W_3	.68	.46	1.97						
CUI Prior to W_3				2.24**	9.39	.88			
MUI Prior to W_3							2.41**	.51	11.13
SC direct effects	-.02	.14	1.00	-.47*	.19	0.63	-.26	.16	0.77
SC indirect effects mediated by PD									
1 *SD* Below	-.40	.10	0.67	-.32	.09	0.73	-.37	.10	0.69
Mean	-.33	.08	0.72	-.34	.09	0.71	-.32	.08	0.73
1 *SD* Above	-.25	.08	0.78	-.35	.12	0.70	-.26	.10	0.77
PD	1.09***	.16	2.97	1.13***	.20	3.10	1.07***	.17	2.92
PC direct effects	-.03	.05	0.97	-.08	.07	0.92	-.03	.06	0.97
Interaction (PD x PC)	-.09	.06	0.91	.02	.07	1.02	-.06	.06	0.94
-2LL	356.90			211.23			255.42		
Log likelihood	80.35			64.77			81.29		
p-value	<.001			<.001			<.001		
McFadden R^2	.18			.23			.24		
Cox & Snell R^2	.22			.18			.23		
Nagelkerke R^2	.30			.32			.35		

Note. * = $p < .05$, *** = $p < .001$, and † = $p \leq .10$; AUI = Alcohol use initiation, CUI = Cigarette Use Initiation, and MUI = Marijuana use initiation; PD = Involvement with deviant peers; SC = School connectedness; PC = Parental control.

Table 12

Moderated Mediation Using Involvement with Deviant Peers as the Mediator and Parental Communication and Involvement as the Moderator

	Model One (AUI)			Model Two (CUI)			Model Three (MUI)		
	Regression on PD			Regression on PD			Regression on PD		
Variables:	β	SE		β	SE		β	SE	
SC	-.30***	.05		-.30***	.05		-.30***	.05	
	Regression on AUI			Regression on CUI			Regression on MUI		
	β	SE	Exp (β)	β	SE	Exp (β)	β	SE	Exp (β)
Family SES	.17	.14	1.19	.01	.17	1.01	.18	.15	1.20
Youth Age	.26†	.13	1.30	-.04	.17	0.96	.17	.16	1.19
Not Married (reference: married)	.12	.35	1.13	-.21	.43	0.81	-.59	.39	0.55
Girls (reference: boys)	.28	.27	1.32	.62†	.37	1.86	-.50	.33	0.61
Nonwhite (reference: white)	-.07	.41	0.93	-1.12†	.57	0.33	-.05	.46	0.95
AUI Prior to W_3	.46	.46	1.58						
CUI Prior to W_3				1.96**	.85	7.10			
MUI Prior to W_3							2.41**	.96	11.02
SC direct effects	.02	.14	1.03	-.44*	.19	0.64	-.26	.17	0.77
SC indirect effects mediated by PD									
1 *SD* Below	-.34	.09	0.71	-.27	.10	0.76	-.28	.10	0.76
Mean	-.33	.08	0.72	-.36	.10	0.70	-.33	.08	0.72
1 *SD* Above	-.31	.09	0.73	-.45	.13	0.64	-.38	.10	0.68
PD	1.09***	.16	2.97	1.20***	.21	3.32	1.11***	.18	3.03
PCI direct effects	-.09*	.04	0.91	-.10	.07	0.90	-.03	.06	0.97
Interaction (PD x PCI)	-.02	.05	0.98	.10	.06	1.12	.05	.06	1.05
-2LL	355.17			209.43			256.32		
Log likelihood	82.09			66.58			80.39		
p-value	<.001			<.001			<.001		
McFadden R^2	.19			.24			.24		
Cox & Snell R^2	.23			.19			.22		
Nagelkerke R^2	.30			.33			.34		

Note. * = $p < .05$, *** = $p < .001$, and † = $p \leq .10$; AUI = Alcohol use initiation, CUI = Cigarette Use Initiation, and MUI = Marijuana use initiation; PD = Involvement with deviant peers; SC = School connectedness; PCI = Parental communication and involvement.

Table 13

Moderated Mediation Using School Connectedness as The Mediator and Parental Knowledge and Affective Relationships as The Moderator

	Model One (AUI)			Model Two (CUI)			Model Three (MUI)		
	Regression on SC			Regression on SC			Regression on SC		
Variables:	β	SE		β	SE		β	SE	
PD	.27***	.06		-.27***	.06		-.27***	.06	
	Regression on AUI			Regression on CUI			Regression on MUI		
	β	SE	Exp (β)	β	SE	Exp (β)	β	SE	Exp (β)
Family SES	.19	.13	1.21	-.007	.18	0.99	.17	.15	1.19
Youth Age	.22	.13	1.25	-.08	.17	0.92	.18	.16	1.20
Not Married (reference: married)	-.07	.34	0.93	-43	.43	0.00	-.70†	.37	0.50
Girls (reference: boys)	.59*	.27	1.80	.75*	.38	2.12	-.26	.31	0.77
Nonwhite (reference: white)	-.09	.39	0.91	-1.10†	.58	0.33	.30	.43	1.35
AUI Prior to W_3	.33	.47	1.39						
CUI Prior to W_3				2.62**	.94	13.74			
MUI Prior to W_3							2.51**	.86	12.30
PD direct effects	.84***	.14	2.32	1.17***	.19	3.22	.84***	.16	2.32
PD indirect effects mediated by SC									
1 *SD* Below	.03	.05	1.03	.04	.07	1.04	.06	.06	1.06
Mean	.05	.04	1.05	-.01	.07	0.99	.04	.05	1.04
1 *SD* Above	.08	.06	1.08	-.06	.10	0.94	.01	.07	1.01
SC	-.20	.14	0.82	.03	.20	1.03	-.14	.16	0.87
PKAR direct effects	-.11*	.04	0.90	-.09	.06	0.91	-.14*	.05	0.87
Interaction (SC x PKAR)	-.03	.04	0.97	.07	.06	1.07	.03	.05	1.03
-2LL	370.28			214.23			270.50		
Log likelihood	68.46			72.12			77.89		
p-value	<.001			<.001			<.001		
McFadden R^2	.16			.22			.20		
Cox & Snell R^2	.19			.18			.20		
Nagelkerke R^2	.26			.31			.30		

Note. * = $p < .05$, *** = $p < .001$, and † = $p \leq .10$; AUI = Alcohol use initiation, CUI = Cigarette Use Initiation, and MUI = Marijuana use initiation; SC = School connectedness; PD = Involvement with deviant peers; PKAR = Parental knowledge and affective relationships.

Table 14

Moderated Mediation Using School Connectedness as the Mediator and Parental Control as the Moderator

	Model One (AUI)			Model Two (CUI)			Model Three (MUI)		
	Regression on SC			Regression on SC			Regression on SC		
Variables:	β	SE		β	SE		β	SE	
PD	-.27***	.06		-.27***	.06		-.27***	.06	
	Regression on AUI			Regression on CUI			Regression on MUI		
	β	SE	Exp (β)	β	SE	Exp (β)	β	SE	Exp (β)
Family SES	.20	.14	1.22	-.01	.18	0.99	.16	.16	1.17
Youth Age	.26†	.13	1.30	-.08	.17	0.92	.21	.15	1.23
Not Married (reference: married)	-.19	.34	0.83	-.52	.44	0.59	-.79*	.37	0.45
Girls (reference: boys)	.45	.26	1.57	.65	.37	1.92	-.38	.31	0.68
Nonwhite (reference: white)	.01	.39	1.01	-1.10	.59	0.33	.32	.42	1.38
AUI Prior to W_3	.44	.46	1.55						
CUI Prior to W_3				2.6**	.95	13.4			
MUI Prior to W_3							2.93**	.70	18.7
PD direct effects	.85***	.14	2.34	1.19***	.19	3.29	.87***	.16	2.39
PD indirect effects mediated by SC									
1 *SD* Below	.14	.07	1.15	.03	.08	1.03	.12	.08	1.13
Mean	.07	.04	1.07	.02	.06	1.02	.05	.05	1.05
1 *SD* Above	.00	.06	1.00	.00	.09	1.00	-.02	.07	0.98
SC	-.27	.14	0.76	-.06	.19	0.94	-.19	.16	0.83
PC direct effects	-.04	.04	0.96	-.10	.06	0.90	-.06	.16	0.94
Interaction (SC x PC)	.09†	.05	1.09	.02	.07	1.02	.09†	.06	1.09
-2LL	373.94			215.46			274.64		
Log likelihood	64.80			60.89			75.77		
p-value	<.001			<.001			<.001		
McFadden R^2	.15			.22			.19		
Cox & Snell R^2	.18			.17			.18		
Nagelkerke R^2	.25			.30			.28		

Note. * = $p < .05$, *** = $p < .001$, and † = $p \leq .10$; AUI = Alcohol use initiation, CUI = Cigarette Use Initiation, and MUI = Marijuana use initiation; SC = School connectedness; PD = Involvement with deviant peers; PC = Parental control.

Table 15

Moderated Mediation Using School Connectedness as the Mediator and Parental Communication and Involvement as the Moderator

	Model One (AUI)			Model Two (CUI)			Model Three (MUI)		
	Regression on SC			Regression on SC			Regression on SC		
Variables:	β	SE		β	SE		β	SE	
PD	-.27***	.06		-.27***	.06		-.27***	.06	
	Regression on AUI			Regression on CUI			Regression on MUI		
	β	SE	Exp (β)	β	SE	Exp (β)	β	SE	Exp (β)
Family SES	.18	.13	1.20	.01	.18	1.01	.18	.15	1.20
Youth Age	.25†	.13	1.28	-.05	.17	0.95	.20	.15	1.22
Not Married (reference: married)	-.10	.34	0.90	-.36	.44	0.70	-.71†	.37	0.49
Girls (reference: boys)	.49†	.26	1.63	.62	.37	1.86	-.37	.31	0.69
Nonwhite (reference: white)	.02	.39	1.02	-1.09	.59	0.34	.23	.43	1.26
AUI Prior to W_3	.36	.47	1.43						
CUI Prior to W_3				2.70**	1.01	14.88			
MUI Prior to W_3							2.30**	.87	9.97
PD direct effects	.84***	.14	2.32	1.18***	.19	3.25	.86***	.16	2.36
PD indirect effects mediated by SC									
1 *SD* Below	.05	.05	1.05	.04	.07	1.04	.06	.06	1.06
Mean	.05	.04	1.05	.01	.06	1.01	.05	.05	1.05
1 *SD* Above	.06	.06	1.06	-.03	.09	0.97	.03	.07	1.03
SC	-.20	.14	0.82	-.02	.19	0.98	-.17	.16	0.84
PCI direct effects	-.09†	.04	0.92	-.01	.06	0.99	.02	.05	1.02
Interaction (SC x PCI)	-.01	.04	0.99	.05	.05	1.05	.01	.05	1.01
-2LL	374.36			217.17			278.35		
Log likelihood	64.38			59.18			61.33		
p-value	<.001			<.001			<.001		
McFadden R^2	.15			.21			.18		
Cox & Snell R^2	.18			.17			.18		
Nagelkerke R^2	.24			.29			.27		

Note. * = $p < .05$, *** = $p < .001$, and † = $p \leq .10$; AUI = Alcohol use initiation, CUI = Cigarette Use Initiation, and MUI = Marijuana use initiation; SC = School connectedness; PD = Involvement with deviant peers; PCI = Parental communication and involvement.

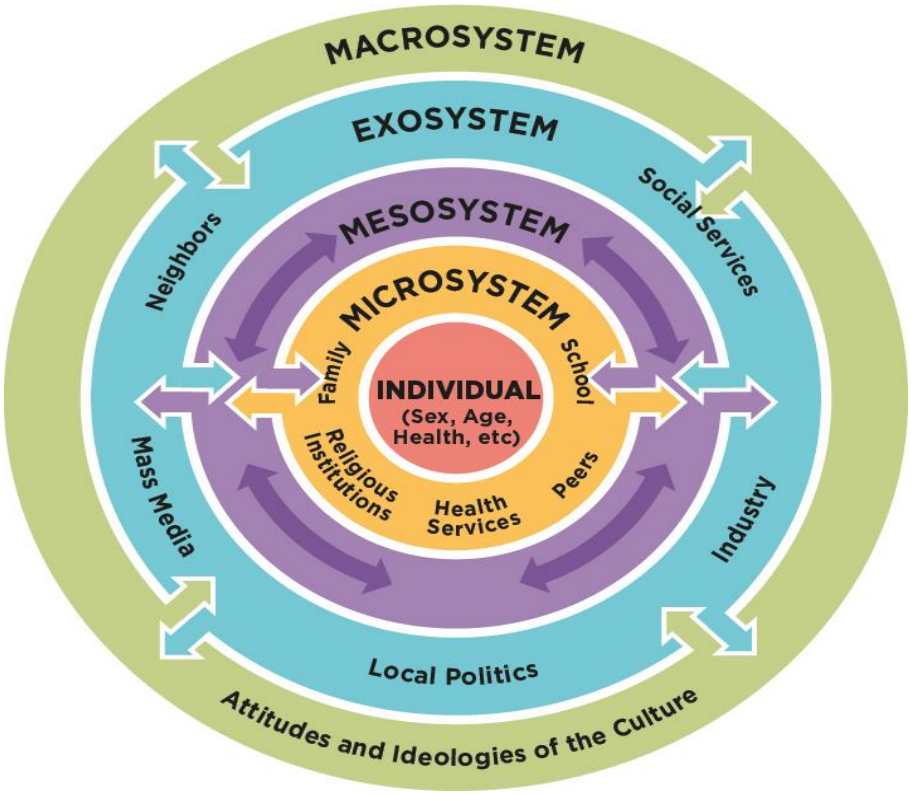
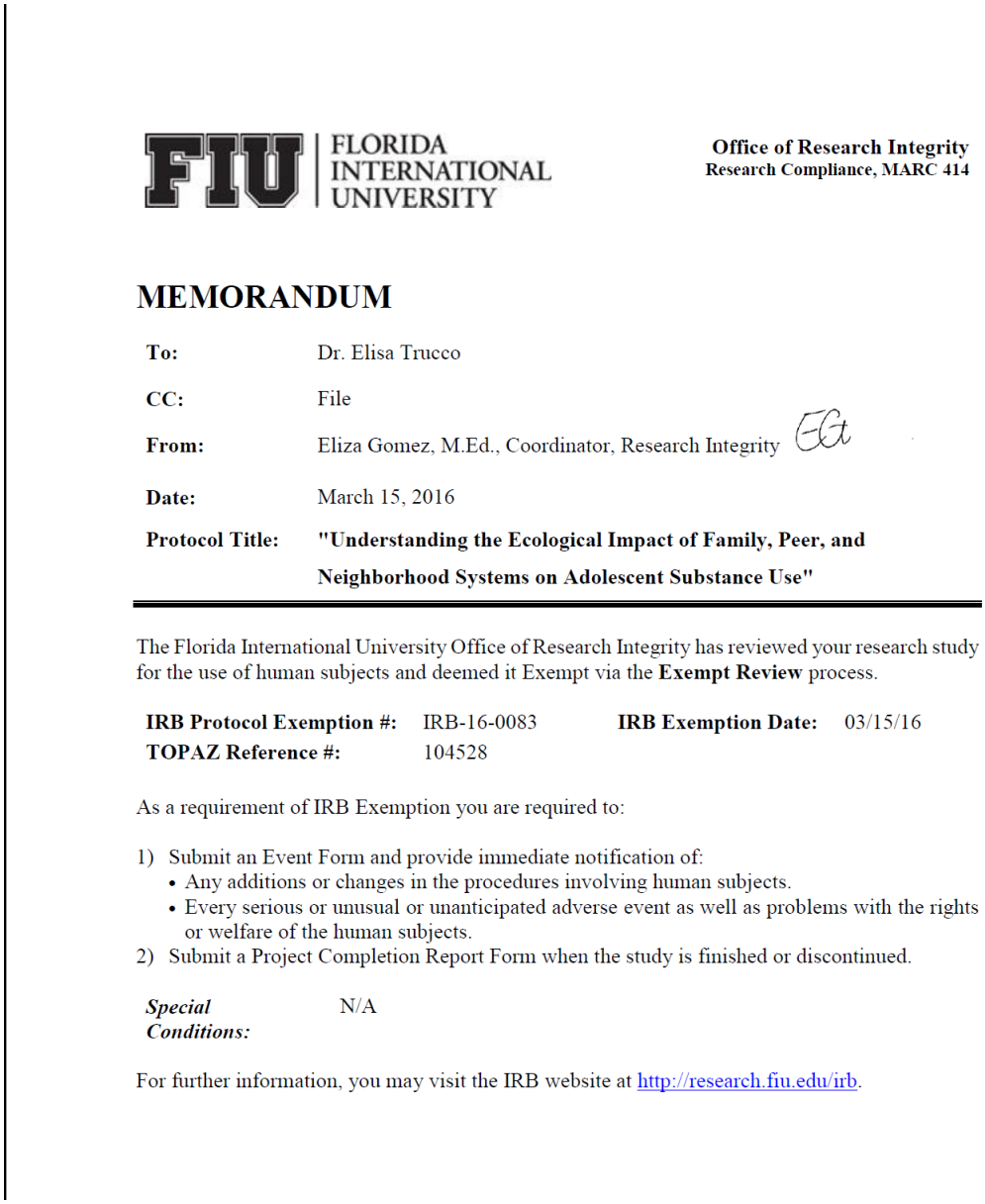


Figure 1. Bronfenbrenner's ecological theory of development. Adapted from "The Ecology of Human Development: Experiments by Nature and Design," by U. Bronfenbrenner, 1979, Cambridge, Mass: Harvard University Press. Image retrieved from https://www.nap.edu/read/23482/chapter/5



FLORIDA INTERNATIONAL UNIVERSITY

Office of Research Integrity
Research Compliance, MARC 414

MEMORANDUM

To:	Dr. Elisa Trucco
CC:	File
From:	Eliza Gomez, M.Ed., Coordinator, Research Integrity EG
Date:	March 15, 2016
Protocol Title:	**"Understanding the Ecological Impact of Family, Peer, and Neighborhood Systems on Adolescent Substance Use"**

The Florida International University Office of Research Integrity has reviewed your research study for the use of human subjects and deemed it Exempt via the **Exempt Review** process.

IRB Protocol Exemption #:	IRB-16-0083	**IRB Exemption Date:**	03/15/16
TOPAZ Reference #:	104528		

As a requirement of IRB Exemption you are required to:

1) Submit an Event Form and provide immediate notification of:
   - Any additions or changes in the procedures involving human subjects.
   - Every serious or unusual or unanticipated adverse event as well as problems with the rights or welfare of the human subjects.
2) Submit a Project Completion Report Form when the study is finished or discontinued.

Special Conditions: N/A

For further information, you may visit the IRB website at http://research.fiu.edu/irb.

Figure 2. IRB Exemption

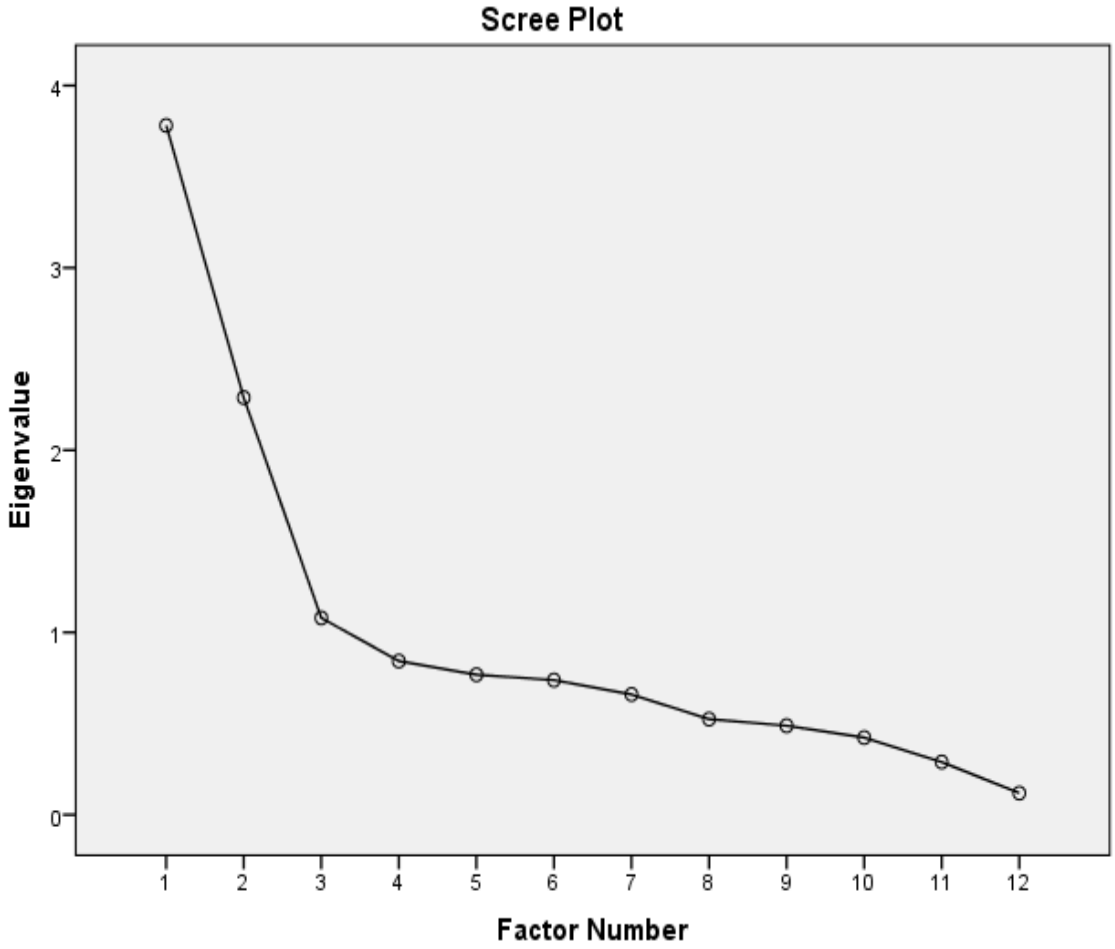


Figure 3. Scree Plot of the Exploratory Factor Analysis

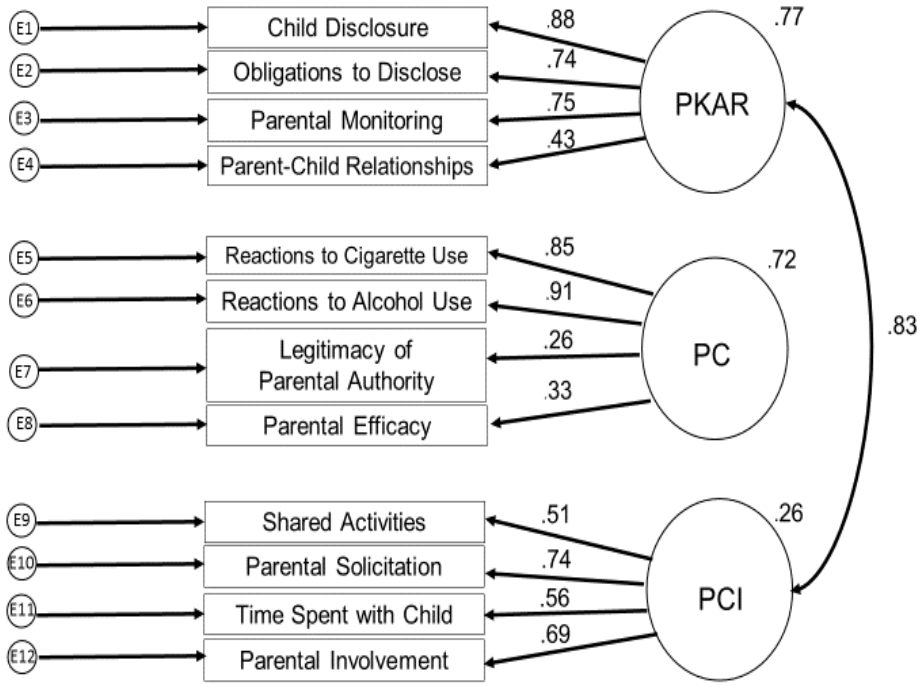


Figure 4. CFA Path Model

Note: PKAR=Parental Knowledge and Affective Relationships (Factor one), PC= Parental Control (Factor two), and PCI = Parental Communication and Involvement (Factor three)

Goodness of Fit Indices: Chi-Square (χ^2)/Significance = 170; Relative/normed chi-square (χ^2/DF) = 3.2; Standardized root mean square residual (SRMR) = .11; Comparative fit index (CFI) = .89.

APPENDICIES

Appendix

Table A1

Parental Monitoring/Knowledge Subscale

Item Number	Item
1	Do you know what your child does during his/her free time?
2	Do you know who your child has as friends during his/her free time?
3	Do you usually know what type of homework your child has?
4	Do you know what your child spends his/her money on?
5	Do you usually know when your child has an exam or paper due at school?
6	Do you know how your child does in different subjects at school?
7	Do you know where your child goes when he/she is out with friends?
8	Normally, do you know where your child goes and what he/she does after school?
9	In the last month, have you ever had no idea of where your child was at night?

Note. Adapted from "What parents know, how they know it, and several forms of adolescent adjustment: Further support for a reinterpretation of monitoring," by M. Kerr and H. Stattin, 2000, *Developmental Psychology*, *36*, p. 366.

Table A2

Child Disclosure Subscale

Item Number	Item
1	Does your child talk at home about how he/she are doing in the different subjects in school?
2	Does your child usually tell how school was when he/she gets home (how they did on different exams, they're relationships with teachers, etc.)?
3	Does your child keep secrets from you about what he/she does during his/her free time?
4	Does your child hide a lot from you about what he/she does during nights and weekends?
5	If your child is out at night, when he/she gets home, do they tell you what he/she did that evening?

Note. Adapted from "What parents know, how they know it, and several forms of adolescent adjustment: Further support for a reinterpretation of monitoring," by M. Kerr and H. Stattin, 2000, *Developmental Psychology*, *36*, p. 366.

Table A3

Parental Solicitation Subscale

Item Number	Item
1	In the last month, have you talked with the parents of your child's friends?
2	How often do you talk with your child's friends when they come to your home?
3	During the past month, how often have you started a conversation with your child about his/her free time?
4	How often do you initiate a conversation about things that happened during a normal day at school?
5	Do you usually ask your child to talk about things that happened during his/her free time?

Note. Adapted from "What parents know, how they know it, and several forms of adolescent adjustment: Further support for a reinterpretation of monitoring," by M. Kerr and H. Stattin, 2000, *Developmental Psychology*, *36*, p. 366.

Table A4

Shared Activities Subscale

Item Number	Item
1	When was the last time that you discussed with your child his/her plans for the coming day?
2	In the past six months about how often have you discussed with your child his/her plans for the coming day?
3	When was the last time you talked with your child about what he/she had done during the day?
4	In the past six months, about how often have you talked with your child about what he/she had actually done during the day?

Note. Adapted from "A new measure of parenting practices involving preadolescent-and adolescent-aged children," by T. Jacob, R. P. Moser, M. Windle, R. Loeber, & M. Stouthamer-Loeber, 2000, *Behavior Modification, 24*, p. 611.

Table A5

Parental Involvement with Child Subscale

Item Number	Item
1	Do you find time to listen to your child when he/she wants to talk to you?
2	Do you and your child do things together at home?
3	How often do you have a friendly chat with your child?
4	Does your child help you?
5	Do you talk with your child about how he/she is doing in school?

Note. Adapted from "A new measure of parenting practices involving preadolescent-and adolescent-aged children," by T. Jacob, R. P. Moser, M. Windle, R. Loeber, & M. Stouthamer-Loeber, 2000, *Behavior Modification, 24*, p. 611.

Table A6

Time Spent with Child Subscale

Item Number	Item
1	On the average, how much time each day are you together with your child on weekdays, that is, when you and your child are both awake?
2	And on weekend days?
3	On weekdays, how much of that time are you doing something together, like making something, playing a game, talking, or going out together?
4	And on weekend days?

Note. Adapted from "A new measure of parenting practices involving preadolescent-and adolescent-aged children," by T. Jacob, R. P. Moser, M. Windle, R. Loeber, & M. Stouthamer-Loeber, 2000, *Behavior Modification, 24*, p. 611.

Table A7

Positive Parenting Subscale

Item Number	Item
1	Not say anything about it, or ignore it?
2	Give him/her a wink or smile?
3	Say something nice about it; praise or give approval?
4	Give him/her a hug, pat on the back, or a kiss for it?
5	Give him/her some reward for it, like a present, extra money, or something special to eat?
6	Give him/her a special privilege such as staying up late, or doing some special activity?
7	Do something special together, such as going to the movies, to a game, playing a game, or going somewhere?
8	Mention it to someone else?

Note. Adapted from "A new measure of parenting practices involving preadolescent-and adolescent-aged children," by T. Jacob, R. P. Moser, M. Windle, R. Loeber, & M. Stouthamer-Loeber, 2000, *Behavior Modification, 24*, p. 611.

Table A8

Parent-Child Relationships Subscale

Item Number	Item
1	Thought your child was a good kid?
2	Felt proud of him/her?
3	Felt like you needed a vacation from him/her?
4	Wished you had never had him/her?
5	Got along with him/her?
6	Thought he/she was a difficult child?
7	Thought he/she was good company?
8	Felt he/she was an easy child?
9	Felt he/she was an affectionate child?
10	Felt he/she was a troublemaker?
11	Enjoyed spending time with him/her?
12	Wished he/she would just leave you alone?
13	Lost patience with him/her?
14	Enjoyed being his/her parent?
15	Felt he/she needed too much attention?

Note. Adapted from "A new measure of parenting practices involving preadolescent-and adolescent-aged children," by T. Jacob, R. P. Moser, M. Windle, R. Loeber, & M. Stouthamer-Loeber, 2000, *Behavior Modification, 24*, p. 611.

Table A9

Curfew Subscale

Item Number	Item
1	Does your child have a set time to be home on school nights?
2	Does your child have a set time to be home on weekend nights?
3	If your child did not come home by the time that was set, would you know?

Note. Adapted from "A new measure of parenting practices involving preadolescent-and adolescent-aged children," by T. Jacob, R. P. Moser, M. Windle, R. Loeber, & M. Stouthamer-Loeber, 2000, *Behavior Modification, 24*, p. 611.

Table A10

Parental Efficacy Subscale

Item Number	Item
1	You can keep your child away from the wrong kinds of kids?
2	You can prevent your child from using drugs
3	You can prevent your child from trying cigarettes
4	You can prevent your child from regularly smoking cigarettes
5	You can prevent your child from trying alcohol
6	You can prevent your child from regularly drinking alcohol
7	You can keep your child away from peers who smoke
8	You can keep your child away from peers who drink alcohol
9	You can enforce rules about smoking for your child
10	You can enforce rules about drinking alcohol for your child
11	You can talk to your child about smoking
12	You can talk to your child about drinking alcohol
13	You can talk to your child about the health risks and consequences of smoking
14	You can talk to your child about the health risks and consequences of drinking alcohol

Note. Adapted from "Beyond modeling: Parenting practices, parental smoking history, and adolescent cigarette smoking," by M. M., Kodl and R. Mermelstein, 2004, *Addictive Behaviors, 29*, p.17.

Table A11

Parental Reactions to Child Cigarette Use Subscale

Item Number	Item
1	Feel proud
2	Feel OK about it
3	Be disappointed with him/her
4	Be angry with him/her
5	Feel offended or disrespected
6	Be worried
7	Say nothing to him/her
8	Tell him/her that it is his/her life or choice
9	Mildly tell him/her that you disapprove
10	Strongly tell him/her that you disapprove
11	Yell at him/her in disapproval
12	Talk with him/her about the reasons why he/she shouldn't smoke
13	Talk with him/her about why he/she did smoke
14	Talk with him/her about how his/her smoking makes you feel
15	Make smoking sound silly or stupid
16	Offer him/her a reward NOT to smoke again
17	Take away privileges, like watching TV, driving, etc.
18	Take away something from him/her (like an allowance, treats)
19	Ground him/her
20	Spank or hit him/her

Item Number	Item
21	Withdraw affection
22	Kick him/her out of the house

Note. Adapted from "Beyond modeling: Parenting practices, parental smoking history, and adolescent cigarette smoking," by M. M., Kodl and R. Mermelstein, 2004, *Addictive Behaviors, 29*, p.17.

Table A12

Parental Reactions to Child Alcohol Use Subscale

Item Number	Item
1	Feel proud
2	Feel OK about it
3	Be disappointed with him/her
4	Be angry with him/her
5	Feel offended or disrespected
6	Be worried
7	Say nothing to him/her
8	Tell him/her that it is his/her life or choice
9	Mildly tell him/her that you disapprove
10	Strongly tell him/her that you disapprove
11	Yell at him/her in disapproval
12	Talk with him/her about the reasons why he/she shouldn't smoke
13	Talk with him/her about why he/she did smoke
14	Talk with him/her about how his/her smoking makes you feel
15	Make smoking sound silly or stupid
16	Offer him/her a reward NOT to smoke again
17	Take away privileges, like watching TV, driving, etc.
18	Take away something from him/her (like an allowance, treats)
19	Ground him/her
20	Spank or hit him/her

Item Number	Item
21	Withdraw affection
22	Kick him/her out of the house

Note. Adapted from "Beyond modeling: Parenting practices, parental smoking history, and adolescent cigarette smoking," by M. M., Kodl and R. Mermelstein, 2004, *Addictive Behaviors, 29*, p.17.

Table A13

Obligations to Disclose Subscale

Item Number	Item
1	Hanging out at a friend's when no adult is home
2	Smokes a cigarette
3	Gets a bad grade or is not doing well on work/tests
4	Who teens like/crush on
5	Doing particularly well on assignment/tests
6	Teens write in emails/letter/journals
7	Finishing homework
8	How teens spend their free time
9	How teens are doing in different school subjects
10	Spending time with someone you don't like
11	Drinks alcohol
12	How teens spend their own money
13	If/who teens are dating
14	Teens talk about on phone w/friends

Note. Adapted from "Disclosure and secrecy in adolescent–parent relationships," by J. G., Smetana, A. Metzger, D. C., Gettman, & N. Campione-Barr, 2006, *Child Development, 77*, p. 201.

Table A14

Parental Authority Subscale

Item Number	Item
1	What my child does after school
2	Who my child's friends are
3	How my child spends his/her money
4	My child drinking alcohol
5	My child smoking cigarettes
6	My child stealing pocket money from me and/or significant other/spouse
7	My child not sharing with his/her brothers and sisters
8	My child hitting his/her brothers and sisters
9	My child lying to me and/or significant other/spouse
10	My child not doing assigned chores
11	My child not keeping me, and/or significant other/spouse informed about his/her activities
12	My child sleeping late on the weekends
13	My child talking on the phone
14	What TV shows and movies my child watches
15	What time my child should be home
16	How my child dresses
17	What time my child needs to come home after being out
18	My child's hairstyle
19	My child's school grades

Item Number	Item
20	My child not cleaning his/her room
21	My child going out with friends instead of our family

Note. Adapted from "Predictors of adolescents' disclosure to parents and perceived parental knowledge: Between- and within-person differences," by N., Darling, P., Cumsille, L. L., Caldwell, & B. Dowdy, 2006, *Journal of Youth and Adolescence*, *35*, p. 667; "Adolescents and parents' conceptions of parental authority," by J. Smetana, 1988, *Child Development, 59*, p. 321; "Adolescents' conceptions of teachers' authority and their relations to rule violations in school," by J. Smetana and B. Bitz, 1996, *Child Development, 67*, p.1153.

Table A15

Parental Demandingness Subscale

Item Number	Item
1	My parent really expects me to follow family rules.
2	My parent really lets me get away with things.
3	If I don't behave myself, my parent will punish me.
4	My parent points out ways I could do better.
5	When I do something wrong, my parent does not punish me.

Note. Adapted from "Construction and validation of the parenting style inventory II (PSI-II)," by N. Darling and T. Toyokawa, 1997, Unpublished Manuscript, Pennsylvania State

Table A16

Parental Control Subscale

Item Number	Item
1	Do you give your child permission to stay out late on a weekday evening?
2	Does your child need to ask you before he/she can decide with his/her friends what he/she will do on a Saturday evening?
3	If your child has been out late one night, do you require that he/she explains what he/she did and who he/she was with?
4	Do you always require that your child tell you where he/she is at night, who he/she are with, and what they do together?
5	Before your child goes out on a Saturday night, do you require him/her to tell them where he/she is going and with whom?

Note. Adapted from "What parents know, how they know it, and several forms of adolescent adjustment: Further support for a reinterpretation of monitoring," by M. Kerr and H. Stattin, 2000, *Developmental Psychology*, *36*, p. 366.

Table A17

Parental Depression Subscale

Item Number	Item
1	Were you bothered by things?
2	You did not feel like eating?
3	You could not shake off the blues?
4	You felt you were just as good as others?
5	You had trouble keeping your mind on things?
6	Did you feel depressed?
7	You felt like everything you did was an effort?
8	Did you feel hopeful about the future?
9	Did you think your life had been a failure?
10	Did you feel fearful?
11	Was your sleep restless?
12	Were you happy?
13	Did you talk less than usual?
14	Did you feel lonely?
15	Were people unfriendly to you?
16	Did you enjoy life?
17	Did you have crying spells?
18	Did you feel sad?
19	Did you feel that people dislike you?
20	Did you feel you could not get going?

Note. Adapted from "The CES-D Scale: A self-report depression scale for research in the general population," by L. S., Radloff, 1977, *Applied Psychological Measurement, 1*, p. 385.

Table A18

Caregiver Injury and Conflict Subscale

Item Number	Item
1	I had a sprain, bruise, or small cut because of a fight with my partner.
2	I felt physical pain that still hurt the next day because of a fight with my partner.
3	I passed out from being hit on the head by my partner in a fight.
4	I went to a doctor because of a fight with my partner.
5	I needed to see a doctor because of a fight with my partner, but I didn't.
6	I had a broken bone from a fight with my partner.

Note. Adapted from "The Revised Conflict Tactics Scales (CTS2)," by M. Straus, S. Hamby, S. Boney-McCoy, D. Sugarman, 1996, Journal *of Family Issues, 17*, p. 283.

Table A19

Current Nicotine Use Subscale

Item Number	Item
1	At present, how soon after you wake up do you smoke your first cigarette?
2	At present, do you find it difficult to refrain from smoking in places where it is forbidden?
3	At present, which cigarette would you hate most to give up?
4	At present, how many cigarettes/days do you smoke?
5	At present, do you smoke more frequently during the first hours after waking than during the rest of the day?
6	At present, do you smoke if you are so ill that you are in bed most of the day?

Note. Adapted from "The Fagerstrom Test for Nicotine Dependence: A revision of the Fagerstrom Tolerance Questionnaire," by T. F., Heatherton, L. T., Kozlowski, R. C. Frecker, & K. O., Fagerstrom,1991, *British Journal of Addiction, 86*, p. 1119.

Table A20

School Connectedness Scale

Item Number	Item
1	You feel close to people at your school.
2	You feel like you are part of your school.
3	You are happy to be at your school.
4	The teachers at your school treat students fairly.
5	You feel safe in your school
6	Homework is a waste of time.
7	You try hard in school
8	Education is so important that it's worth putting up with things about school that you don't like.
9	In general, you like school.

Note. Adapted from "Protecting adolescents from harm: Findings from the National Longitudinal Study on Adolescent Health," by M. D., Resnick, P. S., Bearman, R. W., Blum, K. E. Bauman, K. M., Harris, J. Jones, J. Tabor, T. Beuhring, R. Sieving, R. M., Shew, M. Ireland, L. H. Bearinger, & J. R. Udry, 1997, *Journal of the American Medical Association, 278*, p. 823.

Table A21

Involvement with Deviant Peers Scale

Item Number	Item
1	Purposefully damaged property that did not belong to them, not counting property of their family members
2	Stolen or tried to steal something worth more than $50
3	Purposefully set fire to a building, a car, or other property, or tried to do so
4	Used alcohol without their parents' permission
5	Carried a hidden weapon other than a pocket knife
6	Stolen or tried to steal something worth $5 or less
7	Used marijuana or hashish
8	Sold marijuana or hashish
9	Attacked someone with the idea of seriously hurting or killing them
10	Stole things from parents or family members.
11	Hit or threatened to hit someone (other than a family member)
12	Smoked cigarettes
13	Skipped school without parents' permission
14	Been in trouble with the police

Note. Adapted from "Childhood peer relationship problems and young people's involvement with deviant peers in adolescence," by D. M., Fergusson, D. M., L. J., Woodward, & L. J. Horwood, 1999, *Journal of Abnormal Child Psychology, 27*, p. 357.

Table A22

Substance Use Initiation

Item Number	Item
1	Purposefully damaged property that did not belong to them, not counting property of their family members
2	Stolen or tried to steal something worth more than $50
3	Purposefully set fire to a building, a car, or other property, or tried to do so

Note. Adapted from "Childhood peer relationship problems and young people's involvement with deviant peers in adolescence," by D. M., Fergusson, D. M., L. J., Woodward, & L. J. Horwood, 1999, *Journal of Abnormal Child Psychology, 27*, p. 357.

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PUBLICATIONS AND PRESENTATIONS

Macgowan, M. J. & Ladis, B. (April 2016). Building resilience disaster response teams: Competencies for effective teamwork. Research colloquium, Center for Leadership, College of Business, Florida International University, Miami.

Ladis, B., Macgowan, M., Thomlison, B., Fava, N. M., Huang, H., & Trucco, E. M. (January 2017). Parent-focused prevention interventions for substance use and youth problem behaviors: A systematic review utilizing the Society for Prevention Research efficacy criteria. Poster presented at the Society for Social Work and Research Annual Meeting, New Orleans, LA.

Ladis, B., Huang, H., Thomlison, B., Fava, N. M., & Trucco, E. M. (June 2017). Development of a comprehensive measure of parenting quality for early adolescence. Poster presented at the Society for Prevention Research Annual Conference, Washington D.C.

Ladis, B., Macgowan, M., Thomlison, B., Fava, N., Huang, H., & Trucco, E.M., 2018. Parent-focused preventive interventions for substance use and youth problem behaviors: A systematic review. Research on Social Work Practice, pp 1-23. doi: 10.1177/1049731517753686

Ladis, B., Trucco, E.M, Huang, H., Thomlison, B., & Fava, N.., 2017. Development of a comprehensive measure of parenting quality for early adolescence. Under review with Journal of Research on Adolescence, 01/25/18.

Ladis, B., Huang, H., Thomlison, B., Fava, N. M., & Trucco, E. M. (March 2018). Longitudinal effects of peer, school, and parent contexts on substance use initiation in middle adolescence. Poster accepted for the Collaborative Perspectives on Addiction Annual Meeting, Tampa, Fl