

Reciprocal Relationships between Parenting and Youth Substance Use

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Abstract

The relationship between parenting and child behavior is complex, with some evidence suggesting parenting practices shape child behaviors and other evidence indicating that children's characteristics and behaviors may influence parenting practices. Therefore, the purpose of the current study was to assess longitudinal, bidirectional relationships between three parenting behaviors (i.e., involvement, positive parenting, supervision) and youth substance use during the transitions to middle and high school. Participants were drawn from the control group of a larger longitudinal study and were followed from 4th through 9th grade. Developmental models were created using structural equation modeling. Contrary to hypotheses, analyses revealed that youth substance use and parental involvement and positive parenting behaviors increased in stability during the transition to middle school. Youth substance use influenced parental involvement at 6th and 9th grades, and positive parenting at 7th grade. Parental involvement influenced youth substance use at 8th grade. Supervision had no influence on youth substance use at any grade. Reciprocal relationships were observed between positive parenting and youth substance use at 8th and 9th grades. Models did not differ by gender, but did differ for parental involvement according to the type of substance use, such that involvement was more influential on the development of alcohol use than marijuana or tobacco use. Results are consistent with coercion and systems models which suggest that parents and children adjust their behavior based on the response of the other. Findings concerning the stability of youth substance use and parenting behaviors may impact our understanding of the development of youth substance use across time and improve interventions designed to reduce this behavior during periods of transition.

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Chapter 1

Introduction

Substance use in childhood and adolescence remains a serious public health concern, with individual and societal consequences ranging from immediate to long term for adolescents who continue to abuse substances into adulthood. As such, understanding the nature and course of this developmental process and the factors that influence child and adolescent substance use poses strong theoretical and practical importance. In this vein, researchers have identified a number of correlates and risk factors for youth substance use including economic deprivation; academic failure; normative attitudes about substance use; parenting behaviors; parental substance use and attitudes about substance use; family conflict; peer drug use; stressful life events; and individual risk factors such as impulsivity and sensation-seeking traits (Donovan, 2004; Hawkins, Catalano, & Miller, 1992; Hawkins, Arthur, & Catalano, 1995; Kilpatrick et al., 2000; Nation & Heflinger, 2006; Vakalahi, 2001) relevant for adolescents in the United States as well as cross-culturally (Beyers, Toumbourou, Catalano, Arthur, & Hawkins, 2004; Kliewer & Murrelle, 2007). Risk factors are those factors that, for a given individual, increase the likelihood of initiating or engaging in substance use. In contrast, protective factors are those that reduce the potential of substance use initiation or maintenance directly or by moderating the effects of exposure to identified risk factors (Hawkins et al., 1992; Pollard, Hawkins, & Arthur, 1999). Protective factors that reduce the likelihood of youth substance include prosocial school, community, and peer involvement, family involvement and attachment, religiosity, and sociability and resilient temperament (see Hawkins et al., 1992; Hawkins et al., 1995 for review). Despite advances in these areas, the causes and correlates of youth substance use are many and their functional

relationships varied and complex, thus indicating the necessity of continued examination of the developmental trajectory of this process for future empirical and prevention efforts.

One particularly promising area in this endeavor lies within the domain of parenting. Parenting has long been considered one of the most important social influence mechanisms in childhood behavior (see e.g., Barber & Harmon, 2002; Baumrind, 1991; Darling & Steinberg, 1993; Maccoby & Martin, 1983 for reviews). However, the relationship between parenting and child behavior is complex, with some evidence suggesting that parenting practices shape child behaviors and other evidence indicating that children's characteristics and behaviors may influence parenting practices (e.g., Fite, Colder, Lochman, & Wells, 2006; Huh, Tristan, Wade, & Stice, 2006; Kerr & Stattin, 2003). In addition, parenting practices have been measured in varied ways in the literature (see Barber, Stolz, & Olsen, 2005 for a review), and it is unclear which specific domains (e.g., parental control or support) or parenting strategies (e.g., involvement, positive parenting, supervision) might be most important in understanding the risk and protective factors associated with youth substance use (Barnes & Farrell, 1992; Hawkins et al., 1992). Therefore, a more complete understanding of these mutual effects as well as knowledge of the developmental patterns characterizing possible bidirectional parent-child relationships can inform timing and content of interventions designed to reduce youth substance use.

Accordingly, the overall goal of the current study was to examine the relationships between parenting practices and youth substance use utilizing a developmental transactional modeling approach. Specific aims of the project included determination of possible bidirectional influences between parenting and youth substance use, identification of specific parenting domains and strategies involved in this relationship, examination of how these relationships may change over time during the transition from middle-childhood to

adolescence, and determination of whether these relationships differ for boys and girls and for different types of substance use.

The following sections will summarize the available research examining the relationship between parenting and youth substance use, describe theoretical explanations for the existence of bidirectional effects between parenting practices and youth problem behaviors, provide discussion of the early studies investigating bidirectional effects, and conclude with a rationale and overview of the current study which aimed to examine bidirectionality between three parenting practices and youth substance use across the developmental span of 4th to 9th grade.

Chapter 2

Literature Review

Substance Use in Childhood and Adolescence

Adolescence in particular appears to be an important developmental period to examine substance use, since most substance use is initiated between ages 13 and 15 (Johnson, O'Malley, & Bachman, 1999). Recent statistics from national surveys indicate high rates of substance initiation and regular use of alcohol, tobacco, and marijuana use among youth. For example, according to results from the national Monitoring the Future (MTF) Study of American youth (Johnston, O'Malley, Bachman, & Schulenberg, 2011), at 8th grade, nearly 40% of youth have consumed more than a few sips of alcohol and 18% have been drunk at least once. Similarly, at 8th grade, 21% of youth have tried cigarettes and 7% have become regular smokers, while 14% of youth have tried marijuana, and 1.2 % are reportedly daily marijuana users. While these rates are alarming, prospective studies indicate that rates of substance use tend to increase throughout adolescence until peaking between 18 and 25 years of age (SAMHSA, 2010). Indeed, by 12th grade 72% of youth in the MTF study had consumed alcohol, and 55% of these reported that they had been drunk at least once. Similarly, at 12th grade, 45% of youth had tried cigarettes, more than 30% had used marijuana at least once, and 25% of youth had used an illicit drug other than marijuana. Results from national surveys also suggest that although boys and girls display similar overall rates of substance use in adolescence (Center for Disease Control and Prevention, 2006; Johnston, O'Malley, Bachman, & Schulenberg, 2011; SAMHSA, 2010), boys display slightly higher rates of alcohol, tobacco, and marijuana use, as well as earlier initiation of use (Prescott & Kendler, 1999; York, Welte, Hirsch, Hoffman, & Barnes, 2004).

Research has consistently shown that substance use among adolescents results in numerous immediate and long-term negative consequences, such as participation in criminal activities, decreased prosocial involvement in clubs and activities (Hill, White, Chung, Hawkins, & Catalano, 2000) increased likelihood of high school dropout (NIDA, 2008), violence, risky sexual behavior, suicide (Hingson & Kenkel, 2004), driving injuries and fatal accidents (NHTSA, 2009), adult unemployment and more frequent shifts in employment (Brook, Adams, Balka, & Johnson, 2002), and adult substance use and dependence (Grant et al., 2006). Research also suggests that underage drinking can result in permanent damage to the developing adolescent brain (Brown & Tapert, 2004). The age of initiation is significant, with research demonstrating that the earlier youth initiate substance use, the greater the risk for the development of substance abuse related problems, substance dependence, and poor psychosocial adjustment in young adulthood (Barnes, Welte, & Dintcheff, 1992; D'Amico & McCarthy, 2006; Grant & Dawson, 1997; Mathers, Toumbourou, Catalano, Williams, & Patton, 2006). For example, Hingson and Kenkel (2004) reported that individuals in their sample who began drinking prior to age 15 compared to those who began drinking at or after age 21, were 7 times more likely to be injured in an automobile accident and 10 times more likely to have engaged in a physical fight after consuming alcohol in young adulthood (ages 18-24).

Although research has identified a number of risk factors for substance use during adolescence, it is unclear which risk factors may have the most impact on adolescent substance use. Researchers agree that there appear to be multiple pathways to substance use, and that particularly among adolescents, substance use is a function of multisystem influences, including those of family, peer, and neighborhood environments, as well as individual factors such as temperament or psychopathology (e.g., Ennett et al., 2008;

Hawkins et al., 1992; Kelly et al., 2010). Such findings are consistent with Bronfenbrenner's ecological systems perspective of human development which suggests that youth develop within a multilevel system, and are influenced by dynamic distal and proximal factors that interact with the youth and with other levels within the system across the developmental span of adolescence (Bronfenbrenner, 1979; Bronfenbrenner & Evans, 2000).

Although a multitude of contextual factors clearly impact youth in adolescence, parents have consistently been identified as a major influence on youth problem behaviors including substance use during this developmental period (e.g., Ary et al., 1999; Hops, Davis, & Lewin, 1999; Nash, McQueen, & Bray, 2005; Simons-Morton & Chen, 2005; White, Johnson, & Buyske, 2000). The transition from middle childhood to adolescence poses a number of changes in the parent-child relationship such as greater autonomy and increased influence of peer relationships. Deficiencies in various parenting domains and practices during this transitional period have been implicated as risk factors for youth substance use, while ample levels of parental support and control have been identified as protective factors against the development of substance use in environments that naturally increase risk for this behavior (e.g., among substance using peers, in disadvantaged neighborhoods, in single-parent households). Furthermore, a growing number of prevention and intervention programs specifically target parenting practices in an effort to influence the development of adolescent substance use (Dishion, Kavanagh, Schneider, Nelson, & Kaufman, 2002; Kosterman, Hawkins, Haggerty, Spoth, & Redmond, 2001; Lochman, Wells, & Murray, 2004; Rohrbach et al., 1994). Thus, a strong body of research points toward the importance of determining the dynamic functioning of parents and youth during this transitional period to better conceptualize the development of youth substance use.

Parental Effects on Child and Adolescent Substance Use

The major view of parenting over the past 30 years as it relates to adolescent behavior has been that negative parenting (e.g., poor supervision, lack of involvement, little positive reinforcement) contributes to poor adolescent outcomes. Much of this research is based upon *social control theory* which emphasizes inherent desires for deviance among adolescents that are constrained by pro-social controls provided by family and social institutions (Hirschi, 1969). Closeness within the parent-adolescent relationship is believed to increase adolescents' experiences with conventional models or norms of behavior, while parental control strategies are thought to protect against adolescents' association with deviant models (Hawkins & Weis, 1985). Thus, when parental support and control of adolescent activities is low, adolescents may be affected by peer influence or their own preferences to act on impulses to experiment with substances (Vitaro, Brendgen, & Tremblay, 2000).

Research has identified two broad domains of parenting associated with youth substance use, parental support and control, which include a range of parenting strategies and behaviors. Early conceptualizations of these domains were developed by Schafer, who identified three dimensions of parenting which he labeled "acceptance versus rejection," "psychological control versus psychological autonomy," and "firm control versus lax control" (Schaefer, 1965a, 1965b). Similarly, Baumrind identified two general dimensions of parenting behavior, which she termed "responsiveness" and "demandingness" (Baumrind, 1971, 1991; Baumrind & Black, 1967; Maccoby & Martin, 1983). Parental support behaviors are those that provide messages to the child that they are loved, such as praising, sharing time together, and providing affection (Barnes et al., 2006; Darling, 1999). Conversely, parental control behaviors are those that are directed to shape child behavior according to parental beliefs and norms and include strategies such as supervision of child

whereabouts and activities, limit-setting, and discipline (Barnes & Farrell, 1992). Support and control domains are viewed as dimensional constructs whereby optimal levels of these parenting behaviors are thought to be most helpful for prosocial child development (Barber, 1996; Coie & Dodge, 1998). However, most research supports linear associations between these domains and adolescent functioning (e.g., Barber et al., 2005; Chao, 2001; Galambos, Barker, & Almeida, 2003), excluding those that measure extreme forms of behavioral control such as physical punishment (Kurdek & Fine, 1994; Mason, Cauce, Gonzales, & Hiraga, 1996; Stice, Barrera, & Chassin, 1993). These domains of parenting have received weighty empirical support in their impact on child functioning, including fostering higher academic achievement (Bean, Bush, McKenry, & Wilson, 2003; Jeynes, 2007), self-esteem (Bean et al., 2003; Boutelle, Eisenberg, Gregory, & Neumark-Sztainer, 2009; Plunkett, Henry, Robinson, Behnke, & Falcon, 2007), social competence (Barber et al., 2005; Laible & Carlo, 2004), and self-regulation abilities (Moilanen, Shaw, & Fitzpatrick, 2010), as well as lower levels of internalizing symptoms (Barber et al., 2005; Bean, Barber, & Crane, 2006; Boutelle et al., 2009), externalizing symptoms (Burke, Pardini, & Loeber, 2008), aggression (Kuppens, Grietens, Onghena, & Michaels, 2010), delinquency (Barber, 1996; Bean, et al., 2006; Pettit, Laird, Dodge, Bates, & Criss, 2001; Hoeve et al., 2009), and substance use (Barnow, Schuckit, Lucht, John, & Freyberger, 2002; Huh et al., 2006; Smetana, Crean, & Daddis, 2002).

Three parenting practices within these domains—parental involvement, positive parenting, and parental monitoring—have been consistently supported in the theoretical and empirical literature of parent influences on youth substance-using behavior. Much of this research indicates that inadequate levels of involvement, positive parenting, or monitoring are influential in the onset or maintenance of substance use (e.g., Dishion, Capaldi, & Yoerger,

1999; Fletcher, Steinberg, & Williams-Wheeler, 2004; Griffin, Botvin, Scheier, Diaz, & Miller, 2000; Kumpfer & Bluth, 2004). However, appropriate parenting practices have been shown to protect youth from initiating substance use. In fact, many researchers agree that the parental role is particularly important for structuring and monitoring deviant peer influences as youth transition to increased influence of peer relationships during adolescence (Dishion & McMahon, 1998; Kiesner, Poulin, & Dishion, 2010; Mrug & Windle, 2009; Vitaro et al., 2000; Wood, Read, Mitchell, & Brand, 2004). In this vein, a growing body of research has demonstrated lower rates of substance use initiation as well as smaller increases in alcohol use across adolescence for youth of parents who employ ample and appropriate forms of parental supervision (Barnes, Reifman, Farrell, & Dintcheff, 2000; Dishion, Nelson, & Kavanagh, 2003; Gossrau-Breen, Kuntsche, Gmel, 2009) positive parenting (Dishion, Nelson, & Bullock, 2004; Miller, Loeber, Hipwell, 2009) and parental involvement in child activities (Kerr & Stattin, 2000). Each parenting practice will be reviewed in detail in the following sections.

Parental Involvement

Parental involvement has been conceptualized as an important parental support strategy that encompasses behaviors such as quality time spent with the child, shared communication, and emotional closeness (e.g., Barnes et al., 2000; Goncy & van Dulmen, 2010; Schoppe-Sullivan, McBride, & Ho, 2004). Thus, for a parent to demonstrate involvement, the parent must be a non-absent active participant in the child's life, engaging in discussion and taking part in positive family interactions such as having meals together or engaging in children's extracurricular events.

Research on parental involvement suggests an association between levels of involvement and adolescent substance use. For example, examining multivariate associations between parenting and substance use among 6th through 8th grade students, Simons-Morton and colleagues found that in comparison to less involved parents, the children of highly involved parents were 2.5 times less likely to smoke and 1.67 times less likely to drink alcohol (Simons-Morton, Haynie, Crump, Eitel, & Saylor, 2001). In a second cross-sectional study examining the independent effects of mother and father involvement among adolescents in grades 7 to 12, Gonyea and van Dulmen (2010) found that several aspects of father involvement, namely shared communication and emotional closeness, each had a unique impact on alcohol use, alcohol-related problems, and risky behavior that co-occurred with alcohol use (e.g., risky sex, violence, driving while drunk), beyond the effects of mother involvement. Interestingly, however, the third component of involvement, shared activity participation, did not have a unique impact on any of the adolescent alcohol outcomes. In a longitudinal study examining these relationships, Ary and colleagues found that the likelihood of adolescent substance use was greater when families displayed high levels of family conflict, low levels of family involvement, and poor parental supervision (Ary et al., 1999). However, these variables appeared to occur within a specific developmental process whereby high levels of conflict reduced the likelihood of parental involvement, which led to less parental monitoring of peer associations and substance use behavior.

High levels of parental involvement also appear to protect youth against the development of substance use in adolescence (Hindelang, Dwyer, & Leeming, 2001; Resnick et al., 1997). For example, Resnick and colleagues demonstrated that several parental involvement behaviors (parental presence, parent-adolescent activities, parent-adolescent connectedness), explained 6-9% of the variance in frequency of cigarette, alcohol, and

marijuana use among groups of 7th and 8th grade students and 9th through 12th grade students. Specifically, all three involvement variables were protective against the effects of availability of cigarettes in the home and both parental presence and parent-adolescent connectedness were protective against the effects of availability of alcohol and marijuana in the home, which predicted decreased frequency of use of these substances (Resnick et al., 1997). Similarly, in a sample of African American adolescents, Jordan & Lewis (2005) demonstrated that father presence and participation in shared activities with the adolescent protected against the development of adolescent alcohol use even when the father did not reside within the home. Thus, results of cross-sectional, longitudinal, and intervention studies support the influence of parental involvement on youth substance use outcomes.

Positive Parenting

Positive parenting refers to employing positive reinforcement for prosocial activities and includes such behaviors as praise, physical affection, and warmth (e.g., Loeber, Farrington, Stouthamer-Loeber, & van Kammen, 1998; Shelton, Frick, & Wootton, 1996). Although this parenting strategy involves an aspect of parental control—shaping child behavior—this shaping is provided in a positive, supportive framework (e.g., praising, providing rewards) that supports the child’s self-esteem. Furthermore, in a study examining the factor structure of the measure of positive parenting to be used in the current study, this behavior loaded on the “affective” rather than “control” parenting dimension (Jacob, Moser, Windle, Loeber, & Stouthamer-Loeber, 2000). Thus, positive parenting in the current study has been conceptualized as a form of parental support, although this conceptualization might differ based on the particular positive parenting measure employed.

Lower levels of positive parenting have been empirically linked to child externalizing problems and adolescent delinquency, while higher levels of positive parenting behaviors have been identified as protective factors in families with risk factors for youth problem behaviors (e.g., Barnes & Farrell, 1992; Eisenberg, Zhou, Spinrad, Valiente, Fabes, et al., 2005; Pettit, Bates, & Dodge, 1997). For example, over a 4-year longitudinal assessment of adolescents (5th and 7th grade at the beginning of the study), Gorman-Smith and colleagues (2000) found that adolescents in families displaying high levels of positive parenting were less likely to be involved in juvenile delinquent offending patterns, even though these adolescents were exposed to high levels of neighborhood risk. Similarly, in a meta-analysis of 161 studies examining the links between parenting behaviors and child delinquency, Hoeve and colleagues (2009) demonstrated moderate effect sizes for the impact of positive parenting on adolescent delinquency, which included studies examining rewarding, praising, “noticing when doing good,” and positive reinforcement. No studies to date have examined positive parenting in relation to youth substance use.

Importantly, evidence is varied on the magnitude of the influence of positive parenting on youth behavior problems, and in a number of studies where both positive and negative parenting behaviors are included in predictive models, associations are generally stronger for the influence of negative parenting on adolescent problem behaviors than positive parenting behaviors (Barrera, Biglan, Ary, & Li, 2001; Forehand, Miller, Dutra, & Chance, 1997; Griffin et al., 2000; Patterson, Reid, & Dishion, 1992; Patterson & Stouthamer-Loeber, 1984). Current studies should therefore continue to include comparisons of positive and negative parenting behaviors in models examining parental effects on youth behavior problems and substance use in particular.

Parental Monitoring

Parental monitoring is one of the most widely documented parental control variables to receive support for its associations with adolescent substance use. Monitoring strategies typically include parents' knowledge of their child's activities at home and outside the home through parental solicitation and child disclosure (Kerr, Stattin, & Burk, 2010), acquaintance with their child's friends or dating partners, and imposing limits or restrictions (e.g., curfew, limited interaction with peers on school nights) on these activities and associations (Laird, Pettit, Bates, & Dodge, 2003). Theoretical explanations of parental monitoring suggest that parents can control their youth's opportunities for participation in deviant activities by monitoring their daily interactions (Snyder & Patterson, 1987). In empirical studies, monitoring has been shown to reduce the likelihood of adolescent substance use (Engels & Van der Vorst, 2003; Steinberg, Fletcher, & Darling, 1994; Lochman, 2003; Stanton et al., 2002; Stewart & Bolland, 2002) and optimal levels of parental monitoring have been linked to less heavy substance use among adolescents (Kerr & Stattin, 2000; Van der Vorst et al., 2006).

Chilcoat and colleagues have focused extensively on the role of parental monitoring during middle childhood (Chilcoat & Anthony, 1996; Chilcoat, Dishion, & Anthony, 1995). In their sample of 8 to 11-year-old boys from urban low-income families, they found a two-year delay in drug use initiation for youths in the highest quartile of parent monitoring in comparison to youths with the lowest amounts of parent monitoring, and this effect was largest through age 10. Similarly, Steinberg et al. (1994) found that greater parental monitoring predicted lower rates of substance use among a sample of adolescents assessed over one year, and that effects were strongest at the transition to substance use initiation rather than the transition from initiation to regular use. In a third study, Barnes, Hoffman,

Welte, Farrell, and Dintcheff (2006) demonstrated that adolescents who received consistent monitoring from parents evidenced lower rates of alcohol use, drug use, and delinquency across 3 waves of measurement within at 7-year study period.

Research on youth substance use intervention programs targeting parental monitoring has also demonstrated important protective qualities of monitoring that mitigate risk factors such as parental or peer substance use. For example, Cohen and Rice (1995) found significant reductions in youth tobacco and alcohol use in their intervention sample of parents who participated in “friendship circles” as a way to connect with the parents of their children’s peers and monitor their child’s behavior. More recently, Dishion et al. (2003) employed a family intervention program known as the Family Check-Up, which emphasizes parent monitoring practices (e.g., supervision of activities and structuring of routine) to decrease early substance use initiation. Among their sample of high-risk teens followed from 7th through 9th grade, the authors demonstrated significantly lower levels of substance use initiation in the intervention group compared to the control group following the two year treatment (only 5-6 total sessions).

More recent work has emphasized moderators and mediators of the relationship between parental monitoring and youth substance use. For example, Kung and Farrell (2000) examined a group of 7th graders and found that peer coercion mediated the association between monitoring and youth substance use, such that youth who were poorly monitored were more likely to associate with substance using peers, and therefore more likely to engage in substance use themselves. Griffin et al., (2000) demonstrated that gender and single-parent status moderated the relationship between monitoring and youth substance use such that boys and those from single-parent households engaged in the highest levels of alcohol use and that unsupervised time alone at home predicted increased rates of smoking for girls. However, in

general, higher levels of monitoring have been associated with reduced adolescent alcohol use across age, gender, and ethnicities (Pilgrim, Schulenberg, O'Malley, Bachman, & Johnston, 2006). Other moderators identified in the literature include sibling substance use (Gossrau-Breen et al., 2010; Kuntsche, Gossrau-Breen, & Gmel, 2009) and parental values regarding substance use (Bogenschneider, Wu, Raffaelli, & Tsay, 1998). The findings from this diverse body of literature therefore indicate the significant impact of parental monitoring on the initiation and progression of youth substance use.

It is important to note that although the construct of parental monitoring implies parental solicitation and knowledge of adolescent activities, this knowledge is predicated on the fact that youth choose to disclose their activities to parents (Kerr & Stattin, 2000; Stattin & Kerr, 2000). In fact, in Stattin and Kerr's original work, they emphasized that parent effects of monitoring were very small to nonsignificant when considering the contribution of the child's effect in revealing these activities to parents. In follow-up to this work, researchers utilizing these distinctions have found differences for the influences of parental knowledge and child disclosure on youth problem behaviors. For example, Soenens, Vansteenkiste, Luyckx, and Goosens (2006) found distinct paths for both parental knowledge and youth disclosure on youth problem behaviors cross-sectionally, such that greater parental knowledge and youth disclosure were independently associated with lower rates of youth substance use and delinquency. Using longitudinal analysis, Fletcher et al. (2004) demonstrated that both parental knowledge and parental solicitation had a direct effect on youth substance use and delinquency, but youth disclosure was not discretely measured in this study. In a third study, Kerr and Stattin (2003) conducted longitudinal analyses and found that parental monitoring had little impact on youth behavior, and they concluded that parental monitoring was merely driven by youth disclosure. Interestingly, however, the

authors chose to combine the parental monitoring and solicitation items into a single measure in this study, despite their own past rationale for separation of these parenting behaviors (Stattin & Kerr, 2000). Additionally, although youth disclosure was measured, it was combined with several other types of youth behaviors including “off-task behavior” and “dishonest charm” to create a variable termed “youth behavior in the family.” Such variable combinations may lead to obscuring similarities in the way parental knowledge and youth disclosure impact youth problem behaviors and future studies should seek to examine both youth and parental components of monitoring on risk for youth problem behavior.

Child Effects on Parental Behavior

In addition to the strong body of research in the parental effects tradition, researchers have begun to examine child-to-parent effects in relation to delinquent youth behaviors. In fact, a growing empirical literature suggests that youth antisocial behavior directly influences parenting behavior (see Ambert, 2001; Crouter & Booth, 2003 for review), though the specific influence of youth substance use on parenting behaviors has been less well-studied. Many of these studies suggest that youth behavior that tends to accompany antisocial activities, such as defiance, deception, or secretiveness, may cause parents to change their responses to youth (e.g., lessen supervision or discourse). In an early child effects study, Kandel and Wu (1995) demonstrated that high levels of child aggression at time 1 predicted low levels of parental closeness and monitoring six years later, but closeness and monitoring were not found to have an influence on child aggression across the study period. In a second study, using a cross-lagged model, Kerr and Stattin (2003) demonstrated that high levels of adolescent delinquency predicted low parental control and support as well as inappropriate reactions to adolescent disclosure of delinquent behavior across the two-year study period;

parenting behaviors did not predict adolescent delinquency during the study period. Similarly, Dishion et al. (2004) utilized latent growth curve models to demonstrate longitudinal trends between parental management practices (relationship, positive communication, monitoring) and youth antisocial behaviors (including substance use). The authors found a pattern of “premature autonomy” where parents reduced their involvement and supervision of the youth (at age 15 or 16) in response to earlier antisocial behaviors (at age 9 or 10) and deviant peer involvement (at age 13 or 14). In another study examining child effects, Reitz and colleagues found that adolescent externalizing behaviors (delinquency, aggression, school problems, disobedience) predicted lower levels of parental monitoring and responsiveness 1 year later, but parenting did not significantly predict problem behavior over the study period (Reitz, Dekovic, Meijer, & Engels, 2006). Similarly, Fite et al. (2006) found that child externalizing behavior at grade 4 predicted poor parental monitoring at grades 6 and 7 and predicted inconsistent discipline practices at all grade levels (5th -8th), above and beyond the stability of parenting. Parenting behavior was not related to child behavior after controlling for the stability of child behavior across time. Stability decreases in child and parental behavior at 6th grade suggested that this may be an important transitional period for both parents and children.

The effects of youth substance use on parental behaviors has been understudied in the literature, though recent evidence suggests the existence of these effects. For example, a study by Huh et al. (2006) demonstrated that high levels of externalizing symptoms and substance abuse symptoms among their sample of 14- to 18-year-olds predicted decreases in parental support and control behaviors 1 year later, yet parenting behavior did not significantly predict youth substance use 1 year later. In a second study examining cross-lagged relationships between nonresident fathers’ parenting and youth externalizing behavior

(including a measure of substance use) in a sample of adolescents in grades 7 through 12, Hawkins, Amato, and King (2007) found that externalizing behaviors predicted decreases in level of father involvement one year later, but that parent involvement had no impact on subsequent externalizing behaviors. Overall, the results of several decades of parenting research suggest a complex relationship between parent-to-child and child-to-parent effects that have important implications for understanding the trajectory of youth substance use.

Mutual Influences

Theoretical Models of Reciprocal Influence

Several theoretical models of the development of youth behavior problems posit that parenting practices and child behavior problems are reciprocally related (e.g., Patterson, 1995). For example, Patterson and colleagues have proposed a coercion model, based on social influence models, detailing the active bidirectional influences of parenting and child behavior. The coercion model asserts that children who are oppositional and defiant tend to elicit comparable aversive behaviors (harsh verbal reprimands or physical punishment) from parents. Upon subsequent parental attempts at control, children with conduct problems tend to increase the intensity of their problem behavior, thus fostering a pattern of poor parent-child communication. Over time, as a means of avoiding these aversive exchanges, the parent tends to become less involved with the child and more timid in enforcing rules. The child then learns that parental attempts at control can be avoided by increasing problem behavior, which may lead to further escalations in these types of problems. As the parent withdraws from the relationship, the child tends to receive less positive reinforcement for prosocial behavior, and greater reductions in parental monitoring, leaving the child free to associate with potentially deviant peers.

Similarly Bell's control system model of socialization proposes bidirectional effects of parent involvement and child behavior (Bell, 1980). This model suggests that there are upper and lower limits of behavior set by parents and children. When a participant exceeds the behavioral expectation threshold of the other participant, the other participant reacts in a manner that will bring the behavior back to a desirable level. For example, from the parent direction, if a child fails to comply with instructions, a parent may remove privileges to bring the child's behavior back to the desired level (compliance). From the youth direction, an adolescent may refuse to speak to an overly intrusive parent until they maintain a minimum level of privacy (Pardini, Fite, & Burke, 2008). According to this model, an inability to change the other participant's behavior can often lead to overreactions both from parents (e.g., use of harsh physical punishment) and children (e.g., increases in oppositional or delinquent behavior) (Bell, 1980).

Theory and research have also begun to examine how these reciprocal effects may change across a child's development. Patterson's coercion model suggests that parental monitoring and positive parent-child communication become increasingly more important for preventing behavior problems during adolescence, as youths gain greater independence and begin spending more time with peers outside the home (Shaw & Bell, 1993). However, because adolescence is also a developmental period when youth become more active in initiating and controlling family interactions (relative to their role in childhood), the influence of youth conduct problems on parental involvement may actually increase during this period (Pardini, Loeber, & Stouthamer-Loeber, 2005). For example, as children with conduct problems become adolescents, it may become difficult to get them to disclose information on their whereabouts and parents may tend to disengage from monitoring activities out of frustration (Fite et al., 2006; Laird et al., 2003).

Empirical Studies of Reciprocal Influence

Empirical studies have supported these models for reciprocal effects of parenting practices and antisocial youth behaviors, more generally. For example, Vuccinich, Bank, & Patterson (1992) examined both within-grade and cross-lagged (1-year lag) reciprocal paths between parental discipline and antisocial behavior for a sample of 4th to 6th graders. They found that parental discipline predicted antisocial behavior and vice versa at 6th grade, and that these relationships were best explained within the same grade rather than across time. However, although reciprocal relationships were obtained at 6th grade, overall parent to child effects were much weaker than child to parent effects. In a 4-year longitudinal study, Laird et al. (2003) examined cross-lagged reciprocal relationships among a sample of 9th to 12th graders, across 1-year intervals. The authors found that poor parental monitoring of youth activities during this time period predicted greater adolescent delinquency, while increased adolescent delinquency also predicted higher levels of poor parental monitoring. They concluded that parents and children mutually influence each other during this time period and that these reciprocal effects strengthen as children age. Similarly, in a longitudinal panel analysis of parental behavioral control (conceptualized as parental knowledge and monitoring) among adolescents aged 11-17, Barber et al. (2005) validated a model of parent/child reciprocal effects across time for parental behavioral control and adolescent antisocial behaviors (composite variable that included substance use) both in the US and cross-nationally for 10 different ethnic samples. Consistently across samples and across 1- and 3-year lags, prior parental behavioral control predicted increased levels of antisocial behavior at later time points. The reverse relationship was also supported, such that prior antisocial behavior predicted lower levels of parental behavioral control at later time points (1-year lags only). Recently, Pardini et al. (2008) examined the influence of parental

involvement in an urban sample of boys assessed from 6 to 16 years of age, and found that the influence of conduct problems on changes in parental involvement was as strong as the influence of parental involvement on changes in conduct problems across development.

Although much of the current research examining bidirectional effects has focused on adolescent antisocial behavior more broadly, less research has applied transactional approaches to examine more common types of risky adolescent behaviors such as substance use. In social control and family interaction theories of child and adolescent substance use, parents are viewed as having a fundamental impact on youth behavior such that modeling and parent-child relationship qualities are believed to influence adolescent norms of behavior, and supervision and control of adolescent activities and peers should serve to decrease association with deviant peers and the likelihood of engaging in substance use (e.g., Hawkins & Weis, 1985; Petraitis, Flay, & Miller, 1995). Much less attention has been directed toward examination of the potential impact of youth substance use on parenting behaviors.

Several hypotheses have been put forward related to the impact of substance use on family processes (Coley, Votruba-Drzal, & Schindler, 2008). One hypothesis poses that as adolescents initiate substance use, they may direct their attention from parent to peer relationships, thereby limiting their positive interactions and disclosure with parents. Parents may respond to substance use behaviors in coercive or less effective ways. Alternatively, a second hypothesis is that parent behavior may be unaffected by youth substance use, if they are unaware of youth substance use or view substance use experimentation as normative. It is also possible that parents may react to adolescent substance use with more positive parental involvement and parenting practices, although most of the literature has supported greater likelihood of coercive parenting processes in response to youth problem behaviors.

Empirical studies of the associations between parenting practices and youth substance use have demonstrated that parental monitoring, parental control, parental warmth, and family conflict have predictive influence on youth substance use (e.g., Cohen, Richardson, & Labree, 1994; Duncan, Duncan, Biglan, & Ary, 1998; Griffin et al., 2000; Steinberg et al., 1994). However, only three studies to date have examined bidirectional relationships between parenting behaviors and youth substance use. Stice and Barrera (1995) demonstrated small reciprocal relationships between a composite adolescent substance use variable (i.e., alcohol and 8 illicit substances) and parental support and control over a 1-year study period. Specifically, positive, involved parenting predicted smaller increases in the substance use trajectory, while higher levels of adolescent substance use predicted decreases in the quality of parenting (less support and effective discipline provided). In a more recent study, van der Vorst et al. (2006) found reciprocal relations between strict parental control of activities and adolescent alcohol use for a sample of Dutch adolescents, although the effect size for these relationships were quite small. Additionally, the authors found support for the effect of alcohol use decreasing parent-adolescent closeness, though not the reverse reaction of parent influence on adolescent substance use. Therefore, this study may provide only limited support for reciprocal relationships among parenting and youth substance use. In a final study by Coley and colleagues (2008), bidirectional relationships among parenting and adolescent substance use (composite variable including alcohol, marijuana, and cigarette use) were assessed across a large sample of youth ($N = 3,317$) from a national longitudinal survey. The authors demonstrated reciprocal between-person effects over time such that adolescents who reported higher levels of family activities as well as parent knowledge of friends and teachers at waves 1-3 had lower levels of substance use across the mid-adolescent years (waves 2-4). In addition, adolescents who engaged in substance use at waves 1-3 reported

fewer family interactions and parental knowledge of activities at waves 4-6, though this difference decreased over time. The authors also found within-person differences suggestive of a protective effect where increased adolescent participation in family activities predicted later decreases in substance use despite various risk factors, though the reciprocal within-person relationship was not supported. Thus a host of empirical research lends support to the validity of continued examination of bidirectional models in studies of youth problem behavior, and more recently, youth substance use.

While some studies indicate findings in support of reciprocal relationships, very few have examined how these reciprocal relationships may change across a child's development. Social cognitive theory suggests that the relationships between parenting and child behavior strengthen as children grow older. Specifically research has indicated that a developmental progression may occur in which parents begin to attribute more about their child's behavior to the child himself (i.e., under the child's control) (Dix, Ruble, Grusec, & Nixon, 1986) and that these types of hostile attributions are more likely to lead to harsh discipline practices (Nix et al., 1999). This pattern suggests that as youth grow older, parents' attributions may lead to poor discipline practices that elicit further misbehavior from the child. Consistent with this theory, Rothbaum and Weisz (1994) conducted a meta-analysis which suggested a stronger relationship between child externalizing behaviors and various parenting strategies (rewarding, punishing, threatening) for older (age 6-15) as compared to younger (infancy to 5 years) children. In a more recent study, Laird and colleagues found a reciprocal relationship between parental monitoring and adolescent delinquency from 9th to 12th grade and indicated that the strength of this reciprocal relationship (e.g., both child to parent and parent to child directions) increased with each grade level (Laird et al., 2003). These results suggest the

importance of examining the developmental trajectory of potential reciprocal relationships, particularly within a sample of youth emerging from childhood into adolescence.

Gender as a Moderator of Parent-to-Child and Child-to-Parent Effects

Literature on gender differences of parent and child effects suggests important distinctions in examinations of predictive models. As reported earlier in this manuscript, boys and girls in the 12 to 17 age range demonstrate relatively similar rates of overall substance use, with boys displaying slightly higher rates of alcohol, tobacco, and marijuana use (SAMHSA, 2010) as well as earlier initiation of substance use (e.g., Prescott & Kendler, 1999; York, Welte, Hirsch, Hoffman, & Barnes, 2004). Empirical literature also suggests that parenting behaviors have differential effects on children. In a recent study using dominance analysis, Stolz, Barber, and Olsen (2005) evaluated the relative importance of support and control provided by mothers and fathers on antisocial outcomes (composite measure that included substance use) among a sample of male and female adolescents. The authors found that maternal behavioral control was the most important predictor of boys' antisocial behavior and father support was the most important predictor of both boys' and girls' social initiative. In another study, Engels and van der Vorst (2003) demonstrated that parental implementation of rules decreased the likelihood of adolescents' alcohol use, but that these effects were more pronounced for boys than for girls. Research also suggests that although parental monitoring affects substance use of both boys and girls over time (Schinke, Fang, & Cole, 2008; Webb, Bray, Getz, & Adams, 2002), it tends to impact boys' alcohol use more strongly than girls' alcohol use (Barnes et al., 2000); Griffin et al., 2000; Engels & van der Vorst, 2003; van der Vorst et al., 2006), and girls' cigarette use more strongly than boys' use (Griffin et al., 2000). Other research has suggested that parental support variables may

have a stronger effect on substance use for girls (Choquet, Hassler, Morin, Falissard, & Chau, 2008; Kelly et al., 2011; Yeh, Chiang, Huang, 2006). For example, in a cross-sectional sample of 6th to 12th grade adolescents, Choquet et al. (2008) demonstrated that low levels of parental emotional support were associated with cigarette use among girls but not boys. Similarly, Kelly et al. (2011) found that maternal closeness was longitudinally predictive of girls', but not boys', alcohol use from 5th grade to 11th grade, although mediational effects were also demonstrated when girls were exposed to high-risk peer networks. Additionally, in one of the few studies examining bidirectional effects between parenting and youth substance use, van der Vorst and colleagues (2006) demonstrated that the relationship between parental monitoring and youth substance use differed across adolescent gender, such that boys drank less than girls when parents were monitoring their drinking behavior. They also found that parents exhibited greater psychological control when boys increased their drinking and less psychological control when girls consumed more alcohol. However, there were very few gender differences in the effects of parental attachment on alcohol use, and only a very small effect for youth alcohol use on level of parental attachment for girls, but not boys. Thus, findings suggest that gender differences may depend on the type of substance used or the parenting variable measured (e.g., supportive versus control variables), and these important distinctions may be helpful in determining the ways in which parenting may impact the development of youth substance use.

State of the Field and Description of the Current Research

Although there is a sizable body of literature demonstrating separate parent-to-child and child-to-parent effects on the association between parenting and youth substance use, only recently have authors begun to examine the possibility of mutual effects within this

relationship. Despite the paucity of research on mutual effects, studies show that parents affect children and children affect parents, and gender may influence this relationship. Also of importance is examination of the stability of these behaviors over time as well as determination of whether parenting and youth behaviors may change during periods of transition (e.g., middle childhood to adolescence), both of which have been supported in the literature (Fite et al., 2006; Holmbeck, Paikoff, & Brooks-Gunn, 1995; Vuchinich et al., 1992).

In addition, although much of the literature to date has utilized aggregates of parenting behaviors or aggregates of youth substance use, it may be more informative to examine these bidirectional relationships for specific parenting behaviors and specific substances in order to determine the most significant targets for parenting intervention programs. Implementation of these intervention programs at age appropriate developmental transitions may also impact the protective nature of parental behaviors. For example, the findings of Fite et al. (2006) suggest that behavioral parent training might not be as effective in late childhood and adolescence as it is in earlier childhood. In fact, a number of studies have indicated that families of older children are more prone to drop out of treatment (Dishion & Patterson, 1992; Patterson et al., 1992), potentially because these programs are not as effective for these parents and children. These findings demonstrate both the importance of early prevention in addressing parenting practices and youth substance use, as well as an emphasis on breaking the reciprocal cycles between parents and children (e.g., teaching parents how to appropriately react to their youth's substance use disclosure or behavior, as well as use reinforcement for prosocial activities) that have likely become entrenched by the time these families seek help.

Therefore, the purpose of the current study was to assess longitudinal, bidirectional relationships among certain types of parental support and control practices—parental involvement, positive parenting, and parental monitoring—and substance use for an ethnically diverse sample of youth during the transition to middle school and high school.

Hypotheses

The following three specific hypotheses and three exploratory empirical questions were examined in the proposed research:

1. Are parenting behaviors and youth substance use bidirectionally related, beyond the stability of these behaviors?

Based on coercion and systems theories, low levels of parental involvement, positive parenting, and parental supervision were expected to predict high levels of youth substance use (*c* paths), and high levels of youth substance use were expected to predict low levels of each of the three parenting variables (*d* paths) above and beyond the stability of parenting and youth substance use (*a* and *b* paths) (see Figures 1 and 2).

2. How are parenting behaviors and youth substance use reciprocally related? Specifically, will parenting be reciprocally related to youth substance use within time, or conversely, will earlier parenting predict later youth substance use and earlier substance use predict later parenting behaviors (cross-lagged effects)?

It was expected that within-time negative relationships between parenting and youth substance use would be observed (see Figure 1), such that better parenting would

predict lower levels of youth substance use and lower levels of youth substance use would predict better parenting (consistent with Vuchinich et al., 1992). However, consistent with the across time reciprocal findings of Laird and colleagues (2003) and Coley and colleagues (2008), it was predicted that the model examining cross-lagged effects would provide the best fit to the data (see Figure 2), and therefore, explain a greater proportion of the variance in substance use and parenting. It was hypothesized that cross-lagged effects would provide a better fit within this sample as substance use behaviors can occur more covertly than other antisocial behaviors, such as those found to predict within time effects within the Vuchinich sample. Due to the covert nature of adolescent substance use, it may take longer for parents to discover these behaviors and react to them, which may have been obscured by the time span of the Vuchinich study. Specifically, we expected that for cross-lagged paths, better parenting at time 1 would predict lower levels of youth substance use at time 2 and greater substance use at time 1 would predict decreased parenting at time 2.

3. Do these reciprocal effects change over time? Specifically, do the effects of parenting on youth substance use and the effects of youth substance use on parenting change as children progress through school? Or, conversely, do reciprocal effects remain stable over time?

Consistent with the meta-analytic findings of Rothbaum and Weisz (1994) and more recent reciprocal effects research (Laird et al., 2003), it was hypothesized that reciprocal relationships between parenting and youth substance use would strengthen across children's progression from 4th grade to 9th grade. However, based the findings of Fite et al. (2006), we hypothesized that although these relationships would

generally strengthen over time, reciprocal relationships might be more unstable during times of transition, such as children's transition to middle school.

Because this is one of the first studies to examine bidirectional effects of parenting and youth substance use, we did not have a theoretical or empirical basis from which to make specific predictions related to the differential effects of gender of youth, type of parenting behavior, or type of substance use. We hoped that the following exploratory aims would provide important information to guide future research and intervention.

4. Do these reciprocal effects differ for girls versus boys?
5. Which types of parenting behaviors are most predictive of higher or lower rates of youth substance use?
6. Which types of substance use are most predictive of parenting behaviors?

Although prior literature provides a significant rationale for examining gender effects of parents on the reciprocal relationship between parenting and youth substance use, because we obtained very low rates of fathers as primary caregivers (primary caregivers are respondents for the measures), mother/father differences could not be evaluated in the sample.

Chapter 3

Method

Participants

Participants were drawn from a larger longitudinal study designed to measure the effectiveness of the Coping Power Intervention program for childhood aggression (Lochman & Wells, 2002). Participants were recruited from 17 elementary schools in Durham, North Carolina at the end of their fourth grade year and were followed through their ninth grade year. Teachers rated children on verbal aggression, physical aggression, and disruptiveness on a 5-point scale (1 = almost never to 5 = almost always), to screen aggressive children for inclusion in the study. Based on these ratings, the most aggressive children (31% of the sample) were selected for the potential participant pool. Of these selected, 65% of the parents of the children agreed to participate, achieving an overall sample of 245. Participants were then randomly assigned to treatment or control conditions (control, $n = 126$). For the purpose of the current study, we have chosen to examine variables of interest in the control sample, so that findings are not affected by the intervention.

Sixty-six percent of the sample were boys and the mean age at the start of the study was 10.4 years ($SD = 0.51$). The sample was comprised of individuals from the following ethnic backgrounds: 79% African American, 17% Caucasian, and 4% other ethnicities. The primarily African American composition of the sample is representative of the urban setting from which they were drawn and is significant to note as examination within this at-risk population lends cultural utility to the proposed model. Parenting behaviors were reported by the individual identified as the primary caregiver during the previous 6 months. Of these primary caregivers, most were mothers (90%), although the other 10% included fathers, grandparents, other relatives, and foster parents. Forty-seven percent of the primary

caregivers were either married or cohabitating, while 31% were single parents, 20% were divorced or separated, and 2% were widowed. The study maintained an 87% retention rate of families.

Procedure

Data were collected annually over a period of six years. At the end of each school year, separate interviews to obtain the research measures were conducted with parents and children. Although some interviews were conducted in the research office or at the child's school, the majority of parent and child interviews were conducted in the home (>90%). Primary caregivers provided active informed consent and assent was obtained from children prior to each annual interview. At each of the six data collection periods, primary caregivers were compensated \$40 and children were compensated \$10 for their participation.

Measures of parenting were reported by the primary caregiver and were collected at each assessment period. Measures of child substance use were child-reported and collected at each assessment period. In all frequency analyses, we controlled for prior use (e.g., for frequency of use at seventh grade, we controlled for frequency of use at earlier grades), which allowed us to examine increases across time.

Measures

Parenting

Parenting behaviors were assessed using three of the five subscales from the Parenting Practices Questionnaire—Parent Version (see Appendix) from the Pittsburgh Youth Study (Loeber, Stouthamer-Loeber, Van Kammen, & Farrington, 1989; Loeber, Farrington, Stouthamer-Loeber, & Van Kammen, 1998). The Involvement subscale is composed of 12

items evaluating the parent's involvement in the child's daily activities and routines (e.g., "When was the last time you talked with your child about what he/she had actually done during the day?"). The Positive Parenting subscale consists of six items that assess the parent's use of positive encouragement or rewards for prosocial behavior (e.g., "In the past 12 months, when your child did something that you liked or approved of, how often did you say something nice about it; praise or give approval?"). The Supervision subscale includes two items that evaluate the implementation of parental structure and monitoring of the child's activities (e.g., "Does your child have a set time to be home on school nights?"). Higher scores indicate higher levels of each parenting behavior. It is important to note that although this subscale examines parental supervision or knowledge of youths' activities, it does not include a measure of child disclosure, which is an important source of knowledge for learning about youths' activities and supervising behavior (e.g., Kerr & Stattin, 2000). Factor analysis of this measure's subscales has indicated temporal stability and internal consistency of two distinct parental factors across mothers and fathers, parent "affect" and "control" (Jacob et al., 2000). Specifically, Parental Involvement and Positive Parenting subscales loaded on the parent "affect" dimension and demonstrated alphas ranging from .67 to .84, while Parental Supervision (curfew) loaded on the parent "control" dimension and demonstrated alphas ranging from .98 to .99. In the current study, internal consistencies for Involvement ranged from .71 to .84, for Positive Parenting ranged from .70 to .82, and for Supervision ranged from .43 to .75, across all waves of data. Previous studies have demonstrated that these parenting subscales are associated with youth antisocial behavior (e.g., Burke, Pardini, & Loeber, 2008; Gorman-Smith, Tolan, & Henry, 2000; Loeber et al., 2000; Loeber et al., 2005; Pardini et al., 2005).

Substance use

Child-reported substance use was assessed using the Center for Substance Abuse Prevention Student Survey (see Appendix). Twenty-six items are included in the survey and were adapted from the California Student Survey (Pentz et al., 1989). Three items of primary interest in the current study assessed frequency of alcohol, tobacco (cigarettes, chewing tobacco, snuff, dip), and marijuana use within the past 30 days. A sample item is “On how many days did you use alcohol in the last month (30 days)?” Children respond to questions using a 6-point scale indicating the frequency of use within the past 30 days (0 = no use, 1 = used on 1 or 2 days in the past month, 2 = 3-5 days in the past month, 3 = 6-9 days in the past month, 4 = 10-19 days in the past month, 5 = 20-31 days in the past month). Analyses were conducted to examine each substance separately as well as the influence of a combined substance use variable.

Data Analytic Strategy

Study hypotheses were examined using structural equation models estimated in Mplus (Muthén & Muthén, 2008). Nonrecursive path models were estimated due to the bidirectionality of the tested relationships. Two competing models were tested in analyses: a test of bidirectional effects between parenting and youth substance use within time as well cross-lagged relations between the variables across time.

Full-information maximum-likelihood estimation (FIMLE) was employed to accommodate missing data that was expected due to the longitudinal nature of the data. FIMLE utilizes estimation of means and intercepts in addition to covariances and path estimates, employing all available data simultaneously to calculate parameter estimates (Kline, 1998). FIMLE is intended to maximize the probability that the data (covariation

matrix) is sampled from the population that produced the observed matrix. FIMLE is therefore, considered to be a less biased, more efficient method of handling missing data than other data methods such as pairwise and listwise deletion (Arbuckle, 1996). The FIMLE missing data approach assumes that data are missing at random (MAR; Arbuckle, 1996). To test this assumption in the current sample, participants with and without missing data at Time 1 were compared to determine whether there were significant differences between the groups. No significant differences were found between groups (all $ps > .05$), so it was concluded that the data were missing at random. One participant was missing all study variables at all time points and was excluded from analyses. Therefore, the final models were estimated with a sample size of 125. Additionally, because the substance use variables were not normally distributed (skewness values ranging from 2.87 to 7.55 and kurtosis values from 8.93 to 64.1), robust maximum likelihood was used. This method of estimation utilizes maximum likelihood parameter estimates with standard errors and a chi-square test that are robust to nonnormality.

For the within time model, we examined whether parenting at each grade level predicted youth substance use at the same grade level (c paths, Figure 1), as well as whether youth substance use at each grade level predicted parenting at the same grade level (d paths, Figure 1). In the cross-lagged model, we evaluated whether parenting and youth substance use were related over time. For example, does time 1 parenting predict time 2 youth substance use (c paths, Figure 2) and does time 1 youth substance use predict time 2 parenting (d paths, Figure 2)? For both the within time and cross-lagged models, at fourth grade, parenting behavior and youth substance use were considered exogenous variables, as no other variables were predicting them. For this reason, it was not possible to examine

reciprocal relationships at fourth grade in the within time model. For this model, reciprocal relationships were only examined in grades 5 through 9.

The proposed models are nested because they include the same variables. However, for each of the models, the same number of degrees of freedom is obtained (45df), producing equivalent models. To determine the model with the best fit, we compared the models using the Bayesian Information Criterion (BIC). The model providing the smallest value indicated the better fit to the data and was retained. Before interpretation of the retained omnibus model, we evaluated the stability of youth substance use (*a* paths) and parenting (*b* paths), replicating the strategy employed by Vuchinich et al., (1992). In addition, we evaluated whether the effects of parenting on youth substance use (*c* paths) and the effects of youth substance use on parenting (*d* paths) changed over time (across grades). This was an iterative process. First, all paths were free to vary across grades. A second model was then estimated where the parameter estimates were constrained to be equal across grades. A Satorra-Bentler chi-square difference test, rather than a traditional chi-square difference test, was used to compare the nested models, as the standard chi-square difference test cannot be used in models using MLR estimation. The difference in chi-square values was used to determine whether constraining path coefficients to be equal across grades resulted in a significant decrement in the model χ^2 . When a significant decrement resulted, we concluded that the parameters varied across grade, and we did not retain those constraints. Several of the chi-square difference values were negative when testing these constraints, and could not be interpreted with complete certainty for this reason. A positive-correction for negative chi-square difference values has recently been proposed by the authors (Satorra & Bentler, 2010), but these corrections were not able to be computed in the version of MPLUS used for

analyses. Post hoc tests were conducted on the omnibus model retained after imposition of equality constraints.

Path models were evaluated using the following fit indices, χ^2 , the Comparative Fit Index (*CFI*), and the Root Mean Square Error of Approximation (*RMSEA*). Good model fit is demonstrated when $\chi^2 / df < 2.0$, *CFI* > .95, and *RMSEA* < .06 (Tabachnick & Fidell, 2001). Separate models were evaluated for each parenting domain due to the large number of parameters being estimated.

Finally, we employed the multiple group model approach to examine whether estimates of model parameters varied across gender. The process involved using nested χ^2 tests to evaluate equality constraints, and was similar to the process utilized to determine equality of relationships across grades (see above).

Chapter 4

Results

Descriptive Statistics

At fourth grade, scores for parental involvement ranged from 2.33 to 5 ($M = 4.42$, $SD = .47$), scores for positive parenting ranged from 2.67 to 5 ($M = 4.27$, $SD = .65$), scores for parental supervision ranged from 0 to 2 ($M = 1.79$, $SD = .45$), and scores for combined youth substance use ranged from 0 (no use) to 2.5 (2.5 = 5-6 days/30 days) ($M = .05$, $SD = .26$). At ninth grade, scores for parental involvement ranged from 2.17 to 5 ($M = 4.29$, $SD = .59$), scores for positive parenting ranged from 2.67 to 5 ($M = 4.13$, $SD = .67$), scores for parental supervision ranged from 0 to 2 ($M = 1.80$, $SD = .44$), and scores for combined youth substance use ranged from 0 to 3 (3 = 6-9 days/30 days) ($M = .24$, $SD = .54$). With the exception of the supervision scale, parenting scales were moderately correlated across time points (involvement = .421 - .769; positive parenting = .341 - .552), with adjacent time points being more strongly related. The supervision scale demonstrated low to moderate correlations across time points (range = .083 - .580).

Path Analyses

The fit of the initial within time models, as depicted in Figure 1, ranged from good to poor (involvement: $\chi^2(45) = 210.62$, $CFI = .85$, $RMSEA = .17$; positive parenting: $\chi^2(45) = 121.79$, $CFI = .89$, $RMSEA = .12$; supervision: $\chi^2(45) = 63.20$, $CFI = .95$, $RMSEA = .06$). The fit of the initial cross-lagged models, as depicted in Figure 2, was similar to fit for the within time models and ranged from good to poor (involvement: $\chi^2(45) = 192.17$, $CFI = .87$, $RMSEA = .16$; positive parenting: $\chi^2(45) = 130.12$, $CFI = .88$, $RMSEA = .12$; supervision: $\chi^2(45) = 66.85$, $CFI = .94$, $RMSEA = .06$). However, the within time model provided the

smallest BIC value for each of the parenting models (involvement: 938.45 vs. 947.70; positive parenting: 1418.01 vs. 1426.54; supervision: 794.12 vs. 799.27), indicating better fit to the data, and will, therefore, be retained in subsequent analyses. Modification indices were used to indicate additional parameters that, if fitted, would improve model fit. Residual covariances that reduced the model χ^2 by 5.0 or more, producing significant improvement in model fit ($p < .01$), were estimated in the final models. For the involvement model, these included residual covariances between 5th and 6th, 5th and 7th, 5th and 9th, 6th and 7th, 7th and 8th, and 8th and 9th grade involvement, and 6th and 7th grade youth substance use (Figure 3). However, in subsequent analyses, the residual covariance between 6th and 7th grade youth substance use was removed, to achieve model convergence. For the positive parenting model, these included residual covariances between 5th and 6th, 5th and 8th, 6th and 7th, 7th and 8th, and 8th and 9th grade positive parenting, and 8th and 9th grade youth substance use (Figure 4). For the supervision model, these included residual covariances between 5th and 7th, 6th and 7th, and 7th and 8th grade supervision, and 7th and 8th grade youth substance use (Figure 5). These additions significantly improved model fit, (involvement: $\chi^2 (39) = 91.27$, $CFI = .95$, and $RMSEA = .10$; positive parenting: $\chi^2 (39) = 55.79$, $CFI = .98$, and $RMSEA = .06$; supervision: $\chi^2 (41) = 40.62$, $CFI = 1.0$, and $RMSEA = .00$).

Once the best structure for each path model was determined, the effects of grade on path coefficients were examined. Constraining paths to be equal across grades allows for examination of whether paths differ significantly across grades. For example, if constraining the influence of youth substance use on parenting behavior to be equal across grades (d paths, Figure 1) causes a significant decrement in the model fit, this indicates that the influence of youth substance use on parenting behavior differs across grades. Analyses proceeded first with the stability of youth substance use and parenting behaviors allowed to differ from 4th to

5th grade, 5th to 6th grade, etc. Similarly, the influence of youth substance use on parenting behavior and the influence of parenting behavior on youth substance use were allowed to differ at each grade level. In the second step, paths were constrained to be equal across each grade. Each set of paths, youth substance use stabilities (*a* paths, Figure 1), parenting behavior stabilities (*b* paths, Figure 1), influence of parenting on youth substance use (*c* paths, Figure 1), and influence of youth substance use on parenting behavior (*d* paths, Figure 1), were constrained separately as blocks, and then allowed to vary freely before the next set of constraints was evaluated. Constrained blocks that did not cause a significant decrement ($p > .05$) in the model fit were constrained in the final path models. Each model is reviewed separately below.

Parental Involvement Model

Results demonstrated that constraining the stabilities of either youth substance use or parental involvement to be equal across each grade resulted in a significant decrement in the model fit, $\Delta\chi^2(4) = -66.10$, $p < .001$ and $\Delta\chi^2(4) = 20.54$, $p < .001$, respectively. Similarly, constraining either the influence of youth substance use on parental involvement or the influence of parental involvement on youth substance use to be equal across each grade resulted in a significant decrement in model fit, $\Delta\chi^2(4) = 9.93$, $p < .05$ and $\Delta\chi^2(4) = 92.87$, $p < .001$, respectively. Therefore, in the final model, the stabilities of youth substance use and parental involvement, and the reciprocal influence paths between youth substance use and parental involvement were all free to vary across grade. This model provided an adequate fit to the data, $\chi^2(39) = 91.265$, $p = .00$, $CFI = .95$, and $RMSEA = .10$.

As illustrated in Figure 3, youth substance use was unstable until 6th grade, and then declined somewhat in stability from 7th to 8th grade and remained moderately stable from 8th

to 9th grade. The stability of parental involvement increased from 5th to 6th grade and remained high from 6th to 7th grade, but then decreased slightly from 7th to 8th and 8th to 9th grades. Youth substance use influenced parental involvement at 6th and 9th grades, such that high levels of youth substance use predicted decreased parental involvement beyond the stability of involvement. Youth substance use at 5th, 7th, and 8th grades did not predict change in level of parental involvement above and beyond prior levels of involvement. Parental involvement influenced youth substance use in 8th grade, such that high levels of involvement predicted decreased youth substance use, beyond the stability of youth substance use. Parental involvement at all other grades did not predict changes in the level of youth substance use.

Positive Parenting Model

For the positive parenting model, results indicated that constraining the stabilities of either youth substance use or positive parenting to be equal across each grade resulted in a significant decrement in the model fit, $\Delta\chi^2(4) = -66.10$, $p < .001$ and $\Delta\chi^2(4) = 18.66$, $p < .001$, respectively. Similarly, constraining either the influence of youth substance use on positive parenting or the influence of positive parenting on youth substance use to be equal across each grade resulted in a significant decrement in model fit, $\Delta\chi^2(4) = 31.53$, $p < .001$ and $\Delta\chi^2(4) = 36.25$, $p < .001$, respectively. Therefore, in the final model, the stabilities of youth substance use and positive parenting, and the reciprocal influence paths between youth substance use and positive parenting were all free to vary across grade. This model provided a good fit to the data, $\chi^2(39) = 55.79$, $p = .04$, $CFI = .98$, and $RMSEA = .06$.

Figure 4 demonstrates that youth substance use was unstable until 6th grade, declined somewhat in stability from 7th to 8th grade, but then became highly stable from 8th to 9th

grade. The stability of positive parenting increased dramatically from 5th to 6th grade and remained high throughout subsequent grades. Youth substance use influenced positive parenting at 7th and 9th grades, such that high levels of youth substance use predicted decreased positive parenting beyond the stability of positive parenting. Youth substance use also influenced positive parenting in 8th grade; however, in this instance, high levels of youth substance use predicted increased positive parenting behaviors above and beyond prior levels of positive parenting. Youth substance use at 5th and 6th grades did not predict change in level of positive parenting above and beyond prior levels of positive parenting. Additionally, positive parenting influenced youth substance use in 8th grade, such that high levels of positive parenting predicted reduced levels of youth substance use, but in 9th grade, high levels of positive parenting predicted increased levels of youth substance use. Positive parenting at all other grades did not predict changes in the level of youth substance use.

Parental Supervision

Constraining the stabilities of either youth substance use or parental supervision to be equal across each grade resulted in a significant decrement in the model fit, $\Delta\chi^2(4) = 20.99$, $p < .001$ and $\Delta\chi^2(4) = 41.89$, $p < .001$, respectively. Similarly, constraining either the influence of youth substance use on parental supervision or the influence of parental supervision on youth substance use to be equal across each grade resulted in a significant decrement in model fit, $\Delta\chi^2(4) = -90.04$, $p < .05$ and $\Delta\chi^2(4) = 39.23$, $p < .001$, respectively. Therefore, in the final model, the stabilities of youth substance use and parental supervision, and the reciprocal influence paths between youth substance use and parental supervision were all free to vary across grade. This model provided an excellent fit to the data, ($\chi^2(41) = 40.62$, $p = .49$, $CFI = 1.0$, and $RMSEA = .00$).

Consistent with results from parental involvement and positive parenting models, youth substance use was unstable until 6th grade, declined slightly in stability from 7th to 8th grade, and then remained moderately stable from 8th to 9th grade (Figure 5). Parental supervision was less stable overall than parental involvement or positive parenting. In fact, parental supervision followed a consistent pattern of decrease, then increase, followed by another decrease and so on, across the six grades tested. The stability of parental supervision was particularly low during the transition to middle school (5th to 6th grade) and only moderately stable during the transition to high school (8th to 9th grade). No reciprocal effects were found between parental supervision and youth substance use.

The Impact of Child Gender on Reciprocal Relationships

The next set of analyses evaluated whether child gender impacted the reciprocal relationships between youth substance use and parenting behaviors. Analyses involved estimating a separate unrestricted model for each parenting behavior where all structural paths were free to vary across gender (involvement: $\chi^2 = 141.13$, 78 *df*; positive parenting: $\chi^2 = 163.99$, 78 *df*; supervision: $\chi^2 = 193.11$, 84 *df*) and a second model for each parenting behavior where all structural paths were constrained to be equal across gender (involvement: $\chi^2 = 148.18$, 105 *df*; positive parenting: $\chi^2 = 168.22$, 105 *df*; supervision: $\chi^2 = 207.40$, 108 *df*). For the supervision model, the residual covariance between 7th and 8th grade youth substance use had to be removed from the unconstrained and constrained models to achieve model convergence. Results demonstrated that constraining paths to be equal across gender did not result in a significant decrement in the model fit for involvement, $\Delta\chi^2(27) = 25.30$, $p > .25$, positive parenting, $\Delta\chi^2(27) = 29.66$, $p > .25$, or supervision, $\Delta\chi^2(24) = 33.88$, $p > .05$.

Therefore, relations between youth substance use and parenting behavior appear to be similar across genders.

Analysis of Individual Substances

In the final set of analyses, the impact of individual substances on parenting behaviors and parenting behaviors on individual substances was evaluated. To determine whether separate parenting models should be constructed for each substance, preliminary analyses were conducted by creating an unrestricted covariance model with all substances in the model (involvement: $\chi^2 (258) = 1814.40$; positive parenting: $\chi^2 (258) = 1639.51$; supervision: $\chi^2 (258) = 1415.32$) and a second model where covariances were constrained to be equal across substances (involvement: $\chi^2 (270) = 1883.07$; positive parenting: $\chi^2 (270) = 1665.38$; supervision: $\chi^2 (270) = 1419.833$). Results demonstrated that constraining covariances to be equal across substances did not result in a significant decrement in the model fit for positive parenting, $\Delta\chi^2 (18) = 16.49$, $p > .25$ or supervision, $\Delta\chi^2 (18) = 5.63$, $p < .25$. Therefore, for positive parenting and supervision models, the associations between youth substance use and parenting behavior appear to be similar across substances. However, for parental involvement, adding constraints did result in a significant decrement in the model fit, $\Delta\chi^2 (18) = 56.22$, $p < .001$, and therefore, the associations between youth substance use and parental involvement appear to vary by type of substance used.

To examine the impact of each substance, separate parental involvement models were created for youth alcohol, marijuana, and tobacco use. The fit of the initial models was poor (alcohol: $\chi^2 (45) = 197.98$, $CFI = .74$, $RMSEA = .16$; marijuana: $\chi^2 (45) = 171.70$, $CFI = .87$, $RMSEA = .15$; tobacco: $\chi^2 (45) = 221.10$, $CFI = .78$, $RMSEA = .18$). Modification indices were used to indicate additional parameters that, if fitted, would improve model fit. For the

alcohol model, these included residual covariances between 5th and 6th, 5th and 7th, 6th and 7th, 7th and 8th, and 8th and 9th grade involvement, and between 6th and 7th, 6th and 8th, 7th and 8th, 7th and 9th, and 8th and 9th grade youth alcohol use (Figure 6). For the marijuana model, these included residual covariances between 5th and 6th, 5th and 7th, 6th and 7th, 7th and 8th, and 8th and 9th grade involvement, and between 5th and 7th, 6th and 9th, 7th and 8th, and 8th and 9th grade youth marijuana use (Figure 7). An additional residual covariance was indicated by modification indices (between 6th and 8th grade youth marijuana use), but was removed in order to achieve model convergence. Residual covariances for the tobacco model included those between 5th and 6th, 5th and 7th, 6th and 7th, 7th and 8th, and 8th and 9th grade involvement, and between 6th and 8th and 7th and 8th grade youth tobacco use (Figure 8). These additions significantly improved model fit, (alcohol: $\chi^2(35) = 39.99$, $CFI = .99$, and $RMSEA = .03$; marijuana: $\chi^2(36) = 70.63$, $CFI = .96$, and $RMSEA = .09$; tobacco: $\chi^2(38) = 81.96$, $CFI = .95$, and $RMSEA = .10$).

After determining the best structure for each substance use path model, the effects of grade on path coefficients were examined. Nested χ^2 tests were again used to evaluate equality constraints. Each substance use model is described separately.

Youth Alcohol Use

Results demonstrated that constraining the stabilities of either youth alcohol use or parental involvement to be equal across each grade resulted in a significant decrement in the model fit, $\Delta\chi^2(4) = 151.70$, $p < .001$ and $\Delta\chi^2(4) = 17.71$, $p < .005$, respectively. Similarly, constraining either the influence of youth alcohol use on parental involvement or the influence of parental involvement on youth alcohol use to be equal across each grade resulted in a significant decrement in model fit, $\Delta\chi^2(4) = 105.54$, $p < .001$ and $\Delta\chi^2(4) = -85.02$, $p < .001$.

.001, respectively. Therefore, in the final model, all paths were free to vary across grade. This model provided a good fit to the data, ($\chi^2(35) = 39.99$, $p = .26$, $CFI = .99$, and $RMSEA = .03$).

In this model, youth alcohol use was unstable throughout all grades, with only moderate stability reached from 8th to 9th grade. The stability of parental involvement increased from 5th to 6th grade, then declined somewhat each year thereafter. Similar to overall youth substance use models, youth alcohol use influenced parental involvement at 6th and 9th grades, such that high levels of youth alcohol use predicted decreased parental involvement beyond the stability of involvement. However, in 8th grade, greater levels of youth alcohol use predicted increased levels of parental involvement. Youth alcohol use at 5th and 7th grades did not predict change in level of parental involvement above and beyond prior levels of involvement. Consistent with overall substance use models, parental involvement influenced youth alcohol use in 8th grade, such that high levels of involvement predicted decreased youth alcohol use, beyond the stability of youth alcohol use. Parental involvement at all other grades did not predict changes in the level of youth alcohol use.

Youth Marijuana Use

Constraining the stabilities of either youth marijuana use or parental involvement to be equal across each grade resulted in a significant decrement in the model fit, $\Delta\chi^2(4) = 204.91$, $p < .001$ and $\Delta\chi^2(4) = 28.77$, $p < .001$, respectively. Similarly, constraining the influence of parental involvement on youth marijuana use to be equal across each grade resulted in a significant decrement in model fit, $\Delta\chi^2(4) = 28.77$, $p < .001$. However, constraining the influence of youth marijuana use on parental involvement resulted in a nonsignificant change in the model fit, $\Delta\chi^2(4) = 6.45$, $p > .10$. Therefore, in the final model,

stabilities of youth marijuana use and parental involvement, and the influence of parental involvement on youth marijuana use were all free to vary across grade. In contrast, paths depicting the influence of youth marijuana use on parental involvement were constrained to be equal across grade. This model provided a good fit to the data, ($\chi^2(40) = 75.10, p = .00, CFI = .96$, and $RMSEA = .08$).

As depicted in Figure 7, youth marijuana use was unstable until 6th grade, but then declined in stability in subsequent grades, to the point where marijuana use was again unstable from 8th to 9th grade. As in the other parental involvement models, stability of parental involvement increased from 5th to 6th grade, then declined somewhat each year thereafter. Youth substance use was found to significantly predict parental involvement at all grade levels, such that high levels of youth marijuana use predicted decreases in parental involvement beyond prior levels of parental involvement. Parental involvement did not significantly influence youth marijuana use at any grade level.

Youth Tobacco Use

Analyses indicated that constraining the stabilities of either youth tobacco use or parental involvement to be equal across each grade resulted in a significant decrement in the model fit, $\Delta\chi^2(4) = -50.14, p < .001$ and $\Delta\chi^2(4) = 68.75, p < .001$, respectively. Similarly, constraining the influence of parental involvement on youth tobacco use to be equal across each grade resulted in a significant decrement in model fit, $\Delta\chi^2(4) = 18.01, p < .005$. However, constraining the influence of youth tobacco use on parental involvement resulted in a nonsignificant change in the model fit, $\Delta\chi^2(4) = 3.55, p > .25$. Therefore, in the final model, stabilities of youth tobacco use and parental involvement, and the influence of parental involvement on youth tobacco use were all free to vary across grade. In contrast, paths

depicting the influence of youth tobacco use on parental involvement were constrained to be equal across grade. This model provided a good fit to the data, ($\chi^2(42) = 73.41, p = .00, CFI = .96$, and $RMSEA = .08$).

Figure 8 demonstrates that youth tobacco use was unstable until 6th grade, and then declined to moderate stability again from 8th to 9th grade. As observed in all other parental involvement models, stability of parental involvement increased from 5th to 6th grade, then declined somewhat from 7th to 8th grade, and remained stable from 8th to 9th grade. Youth tobacco use was found to significantly predict parental involvement at all grade levels, such that high levels of youth tobacco use predicted decreases in parental involvement beyond prior levels of parental involvement. Parental involvement did not significantly influence youth tobacco use at any grade level.

Chapter 5

Discussion

The purpose of the current study was to examine both the stability and potential bidirectional relationships between parenting and youth substance use across a sample of youth from 4th to 9th grade. Patterns of stability suggested that youth substance use tended to stabilize between 6th and 7th grade. Parenting tended to increase in stability dramatically from 5th to 6th grade for involvement and positive parenting, but decreased in stability from 5th to 6th grade for parental supervision. This finding is somewhat inconsistent with literature examining stability of parenting and other youth problem behaviors, (e.g., Fite et al., 2006; Pettit, Keiley, Laird, Bates, & Dodge, 2007; Smetana and Daddis, 2002), in that it indicates that the transition to middle school may be a particularly important period of stabilization (rather than instability) of youth substance use and supportive parenting behaviors. Results also demonstrated that youth substance use influenced parental involvement at 6th and 9th grade and positive parenting behaviors at 7th grade, beyond prior levels of parenting. Parental involvement influenced youth substance use at 8th grade, but parental supervision did not influence youth substance use at any grade level. Importantly, reciprocal relationships were demonstrated between positive parenting and youth substance use at 8th and 9th grade, and results seemed to suggest a complex pattern of engagement and disengagement between parent and child. However, these reciprocal effects did not increase consistently across grades, and did not differ by gender of the youth. The parental involvement model of reciprocal effects differed based on the type of substance used, such that involvement was more influential on the development of alcohol use than tobacco or marijuana use. Despite the presence of this singular path from parenting to youth behavior, associations between involvement and youth substance use seem to be best explained by the impact of youth

substance use on parenting at this age span, across each of the three substances. Each set of findings will be discussed in turn.

Stability of Youth Substance Use

In all parenting models, overall youth substance use was unstable until 7th grade, declined somewhat in stability from 7th to 8th grade, and maintained or increased stability from 8th to 9th grade. These findings are consistent with overall trends of youth substance use (Johnston et al., 2011), and suggest that 6th-7th grade is an important transitional period for children's development of this behavior. During this time, children are transitioning to middle school where they have greater access to substances and rely on the approval of peers more consistently than that of their parents (Carlo, Fabes, Laible, & Kupanoff, 1999; Laible, Carlo, & Raffaelli, 2000; Pardini et al, 2005). Prior to 7th grade, there are likely less well-defined norms about substance use (Olds & Thombs, 2001), less access to substances (Hawkins et al., 1992; Petratis, Flay, & Miller, 1995), and more parental monitoring of youth activities (see Agnew, 2003 for a review). These findings indicate that the transition to middle school may be a particularly important period for stabilization of substance use, and that programs designed to impact use should be implemented before this behavior becomes a stable construct.

Stability of Parenting Behavior

Parental involvement and positive parenting were moderately to highly stable from 4th through 9th grade. Stability coefficients for parental involvement and positive parenting ranged from .51 to 1.00, which is consistent with stability coefficients reported in studies of substance use as well as other child problem behavior (e.g., Fite et al., 2006; Hawkins et al.,

2007; Huh et al., 2006; Loeber et al., 2000). Importantly, the sharp increase in stability from 5th to 6th grade, followed by a gradual decrease from 6th to 7th and 7th to 8th grades suggests that the parents' role changes during this developmental period. Prior to adolescence, parents may employ greater levels of these parenting behaviors (Loeber et al., 1998). Following the transition into adolescence, parents may struggle to determine how to respond to their youth's behavior in a developmentally appropriate way, and while some parents may decrease their involvement or positive parenting behaviors as a way to provide for autonomous functioning of their child, other parents may increase these parenting behaviors during this time as a way to maintain a positive relationship or prevent affiliation with risky peers.

The stability coefficients of parental supervision were much more inconsistent, ranging from .17 to 1.00. This inconsistency may be related to lower internal consistencies of parental supervision compared to other parenting behaviors, although the parental supervision subscale has been used widely in examinations of other childhood problem behaviors (Burke et al., 2008; Fite et al., 2006; Gorman-Smith et al., 2000; Loeber et al., 1998; Loeber et al., 2000). It may also be that parents are attempting to adapt their supervision strategies to the changing developmental needs of their youth, which can result in lower consistency.

Additionally, supervision stability decreased from 5th to 6th grade, in contrast to increases in stability during this time period for parental involvement and positive parenting. Parents' behavior during this time period may differ dramatically, where some parents increase monitoring in an attempt to reduce the influence of deviant peers, and other parents reduce monitoring to cultivate a sense of independence for their child (Fite et al., 2006; Laird et al., 2003). The rank-order of parental supervision may shift during this period, as some parents increase and others decrease the amount of supervision provided, which can result in lower stability estimates. Differences across the stabilities of parenting behavior reiterate the

importance of examining parenting behaviors separately rather than combined, in an effort to understand their complex development and relationship to youth problem behaviors.

Reciprocal Effects between Parenting and Youth Substance Use

Contrary to hypotheses, reciprocal effects were not demonstrated between youth substance use and parental involvement within the same time point (same grade). However, youth substance use did influence parental involvement at 6th grade, such that greater youth substance use predicted less involved parenting. As substance use is less stable and well-defined prior to the transition to middle school, parents are only beginning to become aware of their youth's experimentation and use in 6th grade. Similarly, because substance use is primarily a behavior done in secret, it may be that parents only respond to substance use later in development, once it is more evident and stable, as demonstrated in our results in 8th grade. In 8th grade, parents may increase their level of parental involvement in response to substance use, and this in turn predicts decreased youth substance use. Although somewhat decreased, youths may continue to use substances into 9th grade, and parents may give up in their attempts to reduce substance use and become disengaged in their youth's activities.

In contrast, reciprocal effects were found between youth substance use and positive parenting behaviors at 8th and 9th grade, triggered by youth effects on positive parenting at 7th grade. Specifically, youth substance use in 7th grade predicted decreased positive parenting behaviors, which subsequently predicted increased youth substance use in 8th grade. As substance use increased in 8th grade, parents responded by increasing their levels of positive parenting at 8th grade and 9th grade. In response to increased levels of positive parenting, youth continued to increase their substance use, indicating that this parenting behavior was unsuccessful in reductions in use. It may be that in response to continued substance use and a

realization that increased positive parenting did not have the intended effect, parents either raise their tolerance for the behavior, resulting in decreased attempts to provide parental support (Bell & Chapman, 1986; Stice & Barrera, 1995; van der Vorst et al., 2006), or reduce levels of positive parenting in favor of another parental strategy. These findings are consistent with other studies demonstrating bidirectional relationships between parenting and child problem behavior (Kandel & Wu, 1995; Laird et al., 2003; Stice & Barrera, 1995) as well as theories of bidirectionality such as coercion or systems theories (Bell & Chapman, 1986; Patterson, 1995), which implicate a dynamic relationship between youth and parenting behaviors.

Neither parent to child or child to parent effects were observed in the parental supervision model. This finding is perplexing in light of the fact that poor parental monitoring has been consistently linked to other child problem behaviors (e.g., aggression, delinquency; Burke et al., 2008; Fite et al., 2006; Gorman-Smith et al., 2000; Pardini et al., 2008). In relation to youth substance use in particular, low levels of supervision have been identified as a primary influence in the initiation and maintenance of substance use (e.g., Bahr, Hoffman, & Yang, 2005; Chilcoat & Anthony, 1996; Rai et al., 2003; Velleman, Templeton, & Copello, 2005) and have also been modestly supported in bidirectional models of parenting and youth substance use, though the two studies that examined this parenting variable examined parental knowledge of friends and teachers (Coley et al., 2008) and “strict control” (van der Vorst et al., 2006), rather than supervision, *per se*. However, it may be that supportive parenting strategies or other psychosocial factors, such as peer relationships, play a more prominent role in predicting youth substance use during this developmental period (Ferguson & Meehan, 2011). Conversely, it may be that because parental supervision behaviors did not stabilize until 8th grade, sufficient time had not passed for these reciprocal

relationships to develop. Parental supervision may be an important influence of youth substance use during later adolescence and should be tested in bidirectional models at later grades. As a final explanation, because we observed primarily child effects on parenting behaviors rather than the reverse throughout analyses, it may be that our measure of supervision, which did not account for youth disclosure, obscures potential relationships between the supervision construct and youth substance use.

In regard to the magnitude of relationships between youth substance use and parenting behaviors over time, we found that the strength of youth to parent and parent to youth relationships increased across development for positive parenting. This finding is consistent with social control theory (Hirschi, 1969) suggesting that over time, parents and youth become entrenched in these reciprocal patterns, such that increased youth substance use may lead to more extreme parenting (e.g., Patterson, 1995). This finding has also been supported in empirical examinations of other child problem behavior and parenting (Laird et al., 2003; Rothbaum & Weisz, 1994). In contrast, relationships between youth substance use and parental involvement did not follow a predictable increase across grades, and declined altogether at 7th grade. As noted earlier, it may be that during this developmental period, and particularly in response to youth substance use, parents are changing their parenting strategies to find an approach that works to reduce or prevent substance use. They may also be less consistent with parental involvement during this period as they are navigating their youth's transition to less focus on parents and greater reliance on peer relationships.

A second issue related to the developmental timing of youth and parenting behaviors is the finding that the within time model of youth substance use and parenting provided a better fit to the data than comparable cross-lagged models. Although it was hypothesized that a cross-lagged model (across grades) would best describe reciprocal relationships among

parenting and youth substance use, it is important to note that theories of bidirectionality for other youth problem behaviors such as aggression and externalizing behaviors suggest that influences between child and parent behavior should occur in sequence within a short period of time (Bell, 1980; Bell & Chapman, 1986; Chamberlain & Patterson, 1995). Therefore, transactional processes should be most apparent within moment-to-moment behavioral interactions at the same point in time. Thus, reciprocal effects between youth substance use and parenting may similarly occur within discrete time points, rather than across grades, as previously hypothesized. It is also notable that the within time and cross-lagged models provided very similar fit to the data, and that the within time model demonstrated on slightly improved fit (smaller BIC) compared to the cross-lagged model. Thus, it is possible that reciprocal relationships could have also been demonstrated in cross-lagged models, such that earlier youth substance use predicted parenting at later grades and earlier parenting predicted youth substance use at later grades. Both within-time and cross-lagged reciprocal models have been supported in the literature for youth substance use as well as other youth problem behaviors such as aggression, delinquency, and externalizing behaviors (e.g., Coley et al., 2008; Laird et al., 2003; van der Vorst et al., 2006; Vuchinich et al., 1992).

Impact of Gender on the Developmental Model of Reciprocal Effects

Although research indicates slight differences in the amounts of individual substances consumed by boys and girls (SAMHSA, 2010), and differences in the way parents respond to substance use by girls and boys (e.g., van der Vorst, 2006), our findings did not indicate gender differences in the relationship between parental support and parental control variables and youth substance use. However, epidemiological studies suggest that rates of overall substance use are similar across gender (SAMHSA, 2010), which may explain lack of gender

differences for models including a combined substance use variable in the current study. To test for gender differences among individual substances in the current study, separate multiple group models of parental involvement and alcohol, marijuana, and tobacco use were estimated, but convergence could not be reached, likely due to the small sample size of females ($n = 43$) and substance use reported in the study. Therefore, it may be that gender differences are obscured in evaluations of reciprocal relationships using a combined substance use variable, and future studies should examine these relationships with individual substances and larger samples for gender comparisons.

Type of Substance Use

Results indicate a pattern of reciprocal influence for youth alcohol use and parental involvement at 8th grade. While youth alcohol use impacts parental involvement at several grade levels (6th, 8th, and 9th grades), it appears that parental involvement is only predictive of youth alcohol use at 8th grade. Similar to our findings for combined youth substance use and parental involvement, it may be that parents are unaware of youth substance use until this point, when youth alcohol use begins to stabilize. During 8th grade, parental attempts to reduce alcohol use may be effective, and this predicts greater involvement efforts during that same year. After that point, parental involvement may have less of an influence on maintenance of youth alcohol use than other factors such as peers or individual characteristics. Findings suggest that parental involvement does not appear to impact marijuana or tobacco use. This is not necessarily surprising, as the relatively small literature examining the impact of parental involvement on substances other than alcohol has provided inconsistent results, with some studies indicating no impact of involvement on marijuana and tobacco use (e.g., Severson et al., 1991), and others indicating that involvement does have a

significant reduction in levels of these substances (e.g., Tarter, Vanyukov, Kirisci, Reynolds, & Clark, 2006). Conversely, tobacco and marijuana use were both associated with lower levels of involvement, suggesting that parents are either more tolerant of these substances or disengage from the relationship when their children use these substances, and these effects were similar across all grades. It is important to highlight that our sample was predominately composed of African American youth, and our findings are consistent with growing literature indicating that African American parents may be more tolerant of marijuana and tobacco use than alcohol use (Beck, Scaffa, Swift, & Ko, 1995; Caetano & Clark, 1999; Paschal, Lewis, & Sly, 2007). Overall, across each of the three substances, the associations between parental involvement and youth substance use appear to be best explained by youth substance use impacting parenting behavior during this developmental period.

Limitations

Despite the contributions of this study, a number of important limitations should be noted. First, the data only extend from 4th through 9th grades, and the relationships between parenting and youth substance use may differ if examined at older ages. In their sample of 9th through 12th graders, Laird and colleagues (2003) found that reciprocal relationships between parental monitoring and youth delinquency grew stronger across grades. Although the current study did not test relationships between parenting and youth substance use during 9th to 12th grades, it may be that substance use follows a similar pattern to delinquency during this time period. Conversely, it may be that substance use behaviors qualitatively differ from other youth delinquency behaviors that are more apparent and must be dealt with more immediately (i.e., stealing, fighting, etc). In that case, it may be that parents' reactions to

youth substance use decrease as youth advance through high school, in accordance with parental attempts at providing independence. At the same time, youth are gaining additional freedoms and engaging in more autonomous activities, suggesting that the influence of youth problem behavior may be more influential on parenting during 9th through 12 grades, as compared to earlier grades. Developmental models of these reciprocal relationships would therefore benefit from full spectrum examinations (4th through 12th grade) of parenting and youth substance use.

A second limitation is related to the measures utilized in the study. First, the use of self-reported parenting behaviors may have led to over-reporting of involvement, positive parenting, and supervision behavior. Future studies should attempt to correct potential bias by utilizing observer or child measures or interview accounts of involvement. Secondly, the results are limited in the fact that models compare youth substance use within the past 30 days to parenting over the past year. Highly retrospective reports of parenting likely contribute to overestimations of appropriate parenting and underestimations of times where parents were less involved or provided less supervision. Additionally, it may be that the supervision scale, although utilized in a number of other studies of parenting and youth problem behaviors (e.g., Burke et al., 2008; Gorman-Smith et al., 2000; Loeber et al., 2000; Loeber et al., 2005; Pardini et al., 2005), was not the most desirable measure of parental supervision. Internal consistency estimates were low for this measure, particularly in earlier grades, and use of a two-item measure decreased the level of variability in supervision scores considerably. These factors may have thus, obscured the presence of youth, parental, or reciprocal effects in the supervision model. Replication of these findings with other supervision scales, and particularly those that disentangle parent monitoring effects from child disclosure effects (e.g., Kerr & Stattin, 2000; Stattin & Kerr, 2000), may better shed

light on the potential reciprocal effects between youth substance use and parental supervision, and may indicate whether firm distinctions can be drawn between reciprocal effects of supportive versus controlling parenting dimensions in the development of youth substance use. An additional limitation is the use of self-report measures to examine the number of days of youth substance use. As such, levels of substance use may be underestimated due to the potential that youth could have answered questions in an effort to maintain social desirability. However, it is important to note that children have been found to be accurate and reliable reporters of their substance use (Dolcini, Adler, & Ginsberg, 1996; Rosenbaum, 2009; Wills and Cleary 1997), and child reports remain the most commonly used method of obtaining accounts of substance use in adolescence (Johnston et al., 2011). Nonetheless, future studies may address this limitation by obtaining youth substance use information from peer reports.

Additionally, examining reciprocal relationships within an aggressive sample likely provided higher base rates of youth substance use reported in this study than in others, and it must be noted that findings may not necessarily generalize to a more normative population of youth substance users. However, a number of studies examining youth antisocial behavior have demonstrated that these behaviors tend to co-occur during adolescence (e.g., Brady, Tschann, Pasch, Flores, & Ozer, 2000; Farhat, Simons-Morton, & Luk, 2011; Kilpatrick et al., 2000).

A final limitation is related to the small sample of girls in the study. Previous research has indicated gender differences in examinations of relationships between parenting and other youth problem behavior, and for youth substance use when examined by particular substances. Because the majority of our sample was male replication is needed to confirm

how youth gender impacts reciprocal relationships between parenting and youth substance use.

Implications and Future Directions

Taking into account these limitations, the current study is one of the first to provide empirical insight into the bidirectionality of parental support and control in the onset of youth substance use during adolescence. In addition, this study adds to the existing literature that provides overwhelming support for the presence of child effects on parenting and use of this perspective in understanding the development of various youth problem behaviors (see Ambert, 2001; Crouter & Booth, 2003 for reviews). Importantly, despite claims that substance use may have less of an overall effect on parenting than other types of externalizing behaviors (e.g., Huh et al., 2006), our findings suggest that substance use displays comparable reciprocal relationships to those demonstrated between parenting and general externalizing behaviors.

These results also provide support for the hypothesis that parental support variables are of comparable importance to parental control variables in influencing the development of youth substance use. Although some studies have suggested stronger reciprocal associations among parental control variables and youth problem behaviors (e.g., Bean et al., 2003; Huh et al., 2006), findings from the current study indicate the need to consider supportive parenting dimensions in relation to reciprocal models, both on their own, as well as in conjunction with parental control strategies. It may also be important for future studies to consider whether support and control domains impact youth substance use at the same times across childhood and adolescence, or if each parenting domain is more influential at a certain developmental period.

Results also suggest that prevention programs that teach how to implement these parenting strategies based on the age of the child may decrease the likelihood that parents will disengage from parenting behaviors as their children proceed throughout adolescence. For example, it may be that increased amounts of parenting behaviors at first predict less substance use, but then may reach an optimum level, and then decrease in their effectiveness in preventing substance use if it is in an amount inappropriate to the developmental level of the child.

Additionally, results highlight the importance of incorporating the impact of youth behavior on parenting into current prevention and intervention programs. Findings indicate a critical age for targeting youth substance initiation and its negative reciprocal relationships with parental support and control strategies (around 6th-7th grade), and for making prevention programs more applicable to these developmental transitions. For example, programs that target substance use or negative reciprocal patterns prior to 6th grade, may reduce the likelihood that children and parents become entrenched in these behavioral patterns, even though substance use may have already been initiated.

Finally, results indicate that these reciprocal relationships were observed in both an ethnically diverse and aggressive sample of youth. This is a significant strength of the study in that associations between parenting and youth substance use were demonstrated within a population at-risk for substance abuse. Such findings are consistent with other samples of high-risk youth (e.g., Dishion et al., 2003; Griffin et al., 2000), and may indicate that supportive parenting is protective for youth with other risk factors for substance use such as peer or parental substance use, single-parent status, neighborhood disadvantage, etc.

Future directions of this work include research to determine whether reciprocal effects differ by gender, through examinations of individual substance by parenting patterns.

Additionally, studies should examine whether these relationships might differ based on the amount of substances abused, as parents may be less likely to tolerate or ignore more heavy substance use due to potential legal ramifications. A second important implication of this research is the need to differentiate between mothers' and fathers' parenting in reciprocal relationships with youth substance use. Although much of the existing literature involves examinations of mothers' parenting and youth problem behaviors, very little research has demonstrated the processes in which fathers influence youth behavior or whether fathers are differentially affected by youth problem behavior (Coley & Medeiros, 2007; Coley et al., 2008; Ream & Savin-Williams, 2005). Some theorists assert that contextual factors have a greater impact on fathers' parenting as compared to mothers' parenting (Doherty, Kouneski, & Erickson, 1998), which may suggest that youth problem behaviors such as substance use may predict fathers' parenting more strongly or in different ways than it predicts mothers' parenting.

Studies should also attempt to evaluate effects across longer time periods, or among older youth (e.g., 9th to 12th grade) to better understand the development of reciprocal relationships, once substance use has become a more stable behavior. It would also be beneficial to examine reciprocal relationships of youth substance use and parenting across grades, as the relationships between parenting and substance use may differ from the within time findings. Finally, future studies should examine other potential moderators of these reciprocal relationships such as parental substance use or peer variables such as peer substance use or approval of substance use. For example, parents who abuse substances heavily might provide less limit-setting or monitoring of youth whereabouts than parents who use substances to lesser extent, which may affect subsequent youth substance use. Further consideration of these reciprocal relationships and the moderating factors that may influence

them will clarify our ability to better describe and predict the development of youth substance use in adolescence.

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Appendices

Appendix A: Tables

Table 1. Correlations among parenting variables.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.
1. Involve T1	1																	
2. Involve T2	.727**	1																
3. Involve T3	.769**	.759**	1															
4. Involve T4	.687**	.738**	.685**	1														
5. Involve T5	.598**	.589**	.579**	.570**	1													
6. Involve T6	.421**	.493**	.484**	.511**	.549**	1												
7. Positive T1	.443**	.319**	.426**	.449**	.347**	.231*	1											
8. Positive T2	.581**	.598**	.648**	.555**	.523**	.478**	.514**	1										
9. Positive T3	.442**	.421**	.507**	.360**	.381**	.371**	.539**	.703**	1									
10. Positive T4	.526**	.450**	.488**	.580**	.592**	.519**	.552**	.613**	.526**	1								
11. Positive T5	.331**	.286**	.280**	0.188	.501**	.453**	.354**	.503**	.452**	.430**	1							
12. Positive T6	.274**	.306**	.286**	.254*	.347**	.451**	.341**	.443**	.421**	.443**	.509**	1						
13. Super T1	.215*	0.067	0.064	0.048	0.051	0.114	0.073	0.033	0.125	-0.039	-0.098	-0.011	1					
14. Super T2	0.103	0.083	0.037	-0.016	0.15	.209*	-0.031	0.083	0.162	0.06	0.031	0.07	.305**	1				
15. Super T3	0.054	0.062	0.046	-0.03	0.045	0.15	0.002	0.109	0.138	0.112	0.052	0.131	0.149	0.142	1			
16. Super T4	-0.104	-0.005	-0.056	-0.016	0.031	0.018	-0.098	-0.119	-0.095	0.071	-0.073	-0.051	0.088	.280**	.248*	1		
17. Super T5	-0.065	-0.147	-0.047	-0.039	0.075	0.138	0.047	-0.075	0.027	0.188	0.048	0.025	0.083	.276**	.279**	.580**	1	
18. Super T6	0.028	-0.037	0.118	-0.03	0.166	.269**	0.04	0.039	0.145	0.132	.307**	0.147	0.13	0.164	.259**	.284**	.508**	1

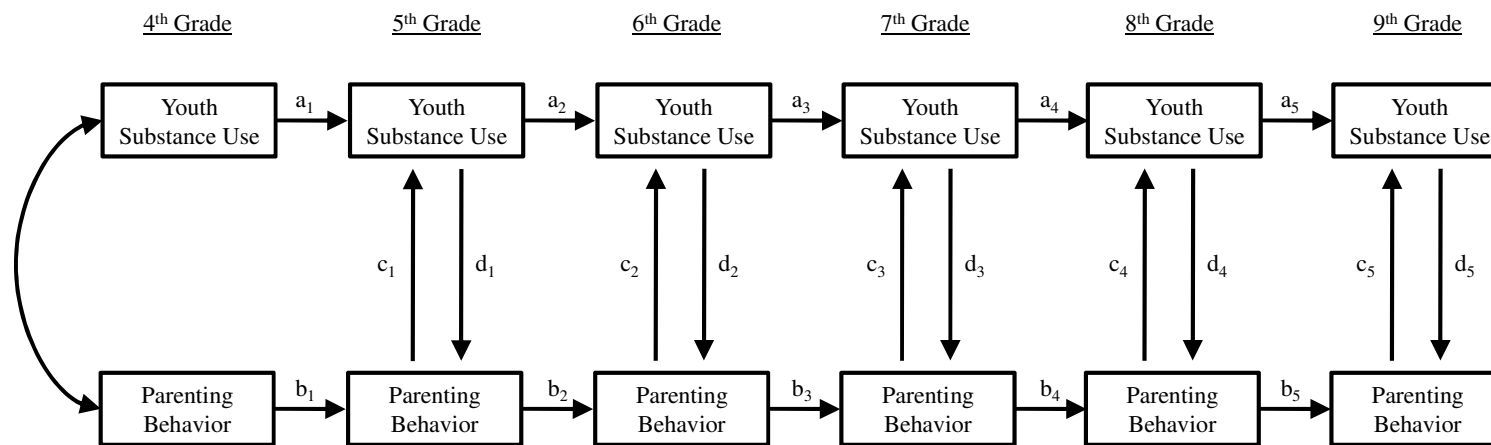
**p < .01, *p < .05

Table 2. Correlations among youth substance use variables.

	1.	2.	3.	4.	5.	6.
1. Days Used Substances Time 1	1					
2. Days Used Substances Time 2	0.144	1				
3. Days Used Substances Time 3	-0.042	-0.039	1			
4. Days Used Substances Time 4	-0.038	0.002	.863**	1		
5. Days Used Substances Time 5	-0.035	-0.043	.516**	.692**	1	
6. Days Used Substances Time 6	0.062	-0.08	.369**	.560**	.642**	1

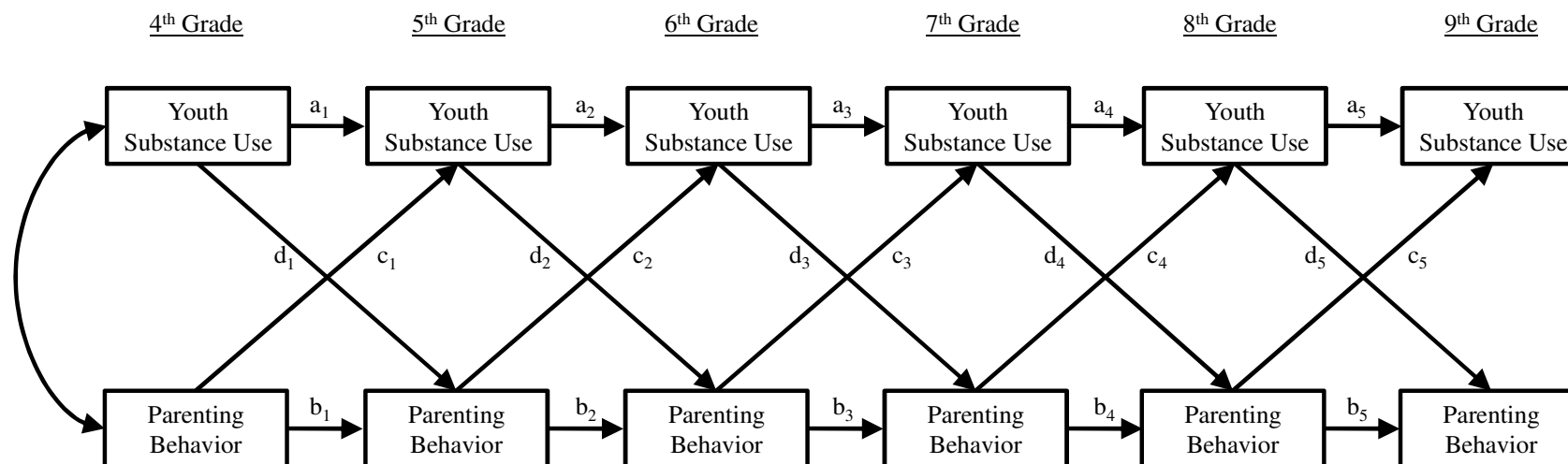
**p < .01

Appendix B: Figures



Note: a = 1-year youth substance use stability; b = 1-year parenting behavior stability; c = influence of parenting on youth substance use; d = influence of youth substance use on parenting behavior.

Figure 1. Initial nonrecursive within time path model.



Note: a = 1-year youth substance use stability; b = 1-year parenting behavior stability; c = influence of parenting on youth substance use; d = influence of youth substance use on parenting behavior.

Figure 2. Initial nonrecursive cross-lagged path model.

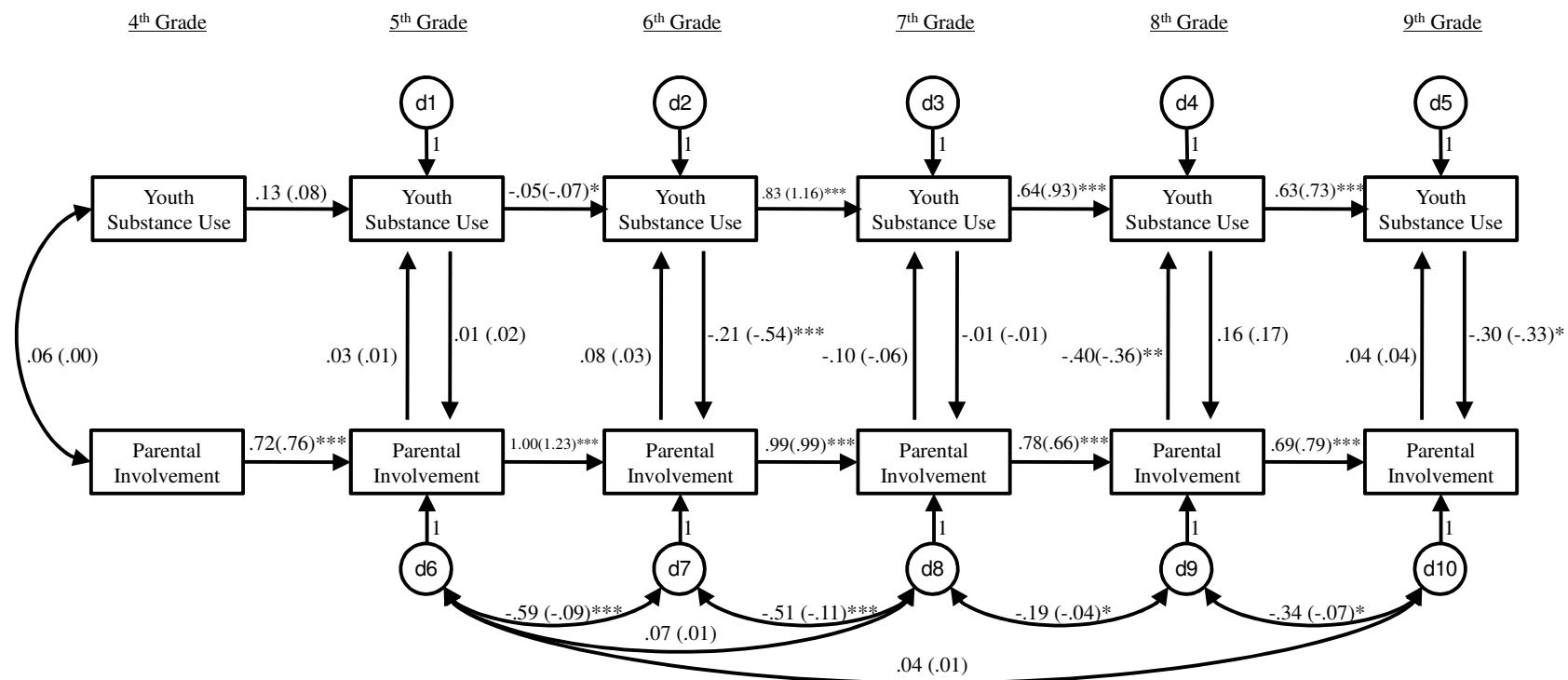


Figure 3. Final nonrecursive within time path model relating youth substance use and parental involvement.

Figure 4. Final nonrecursive within time path model relating youth substance use and positive parenting.

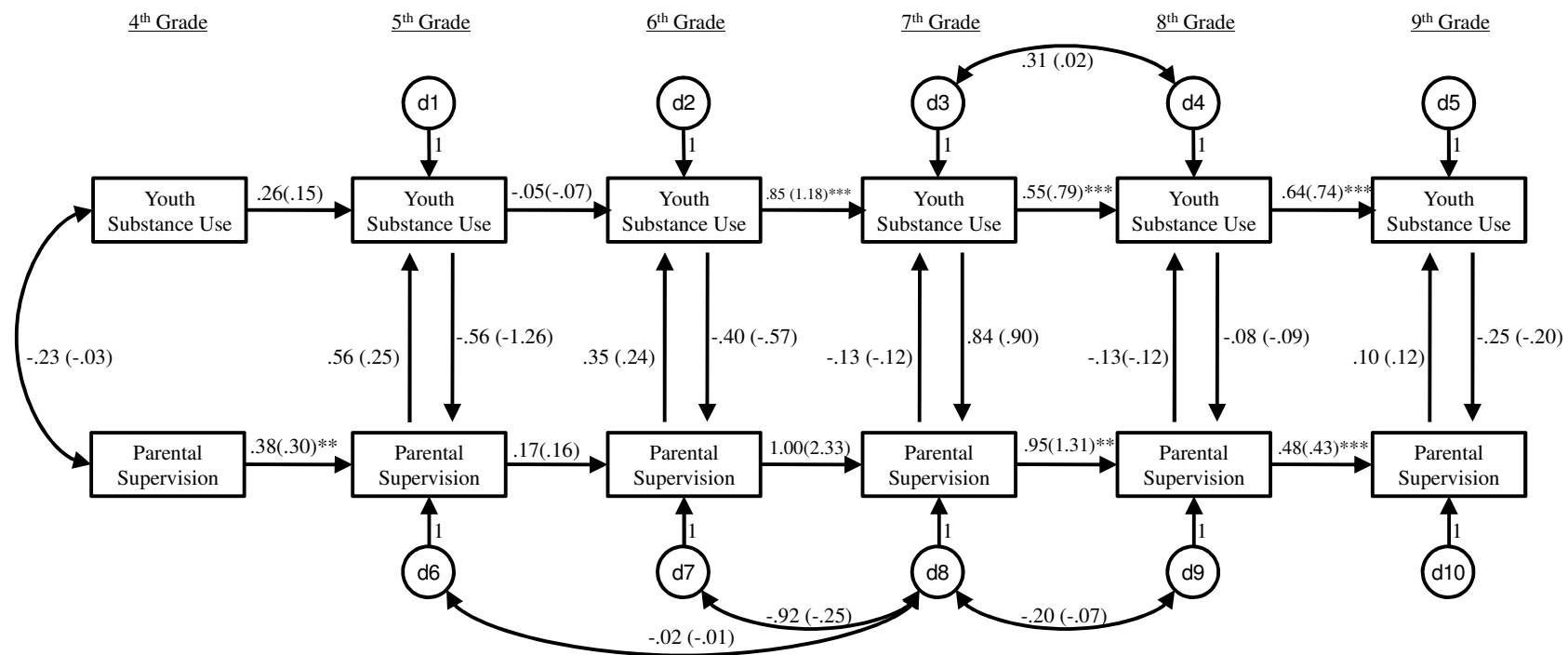


Figure 5. Final nonrecursive within time path model relating youth substance use and parental supervision.

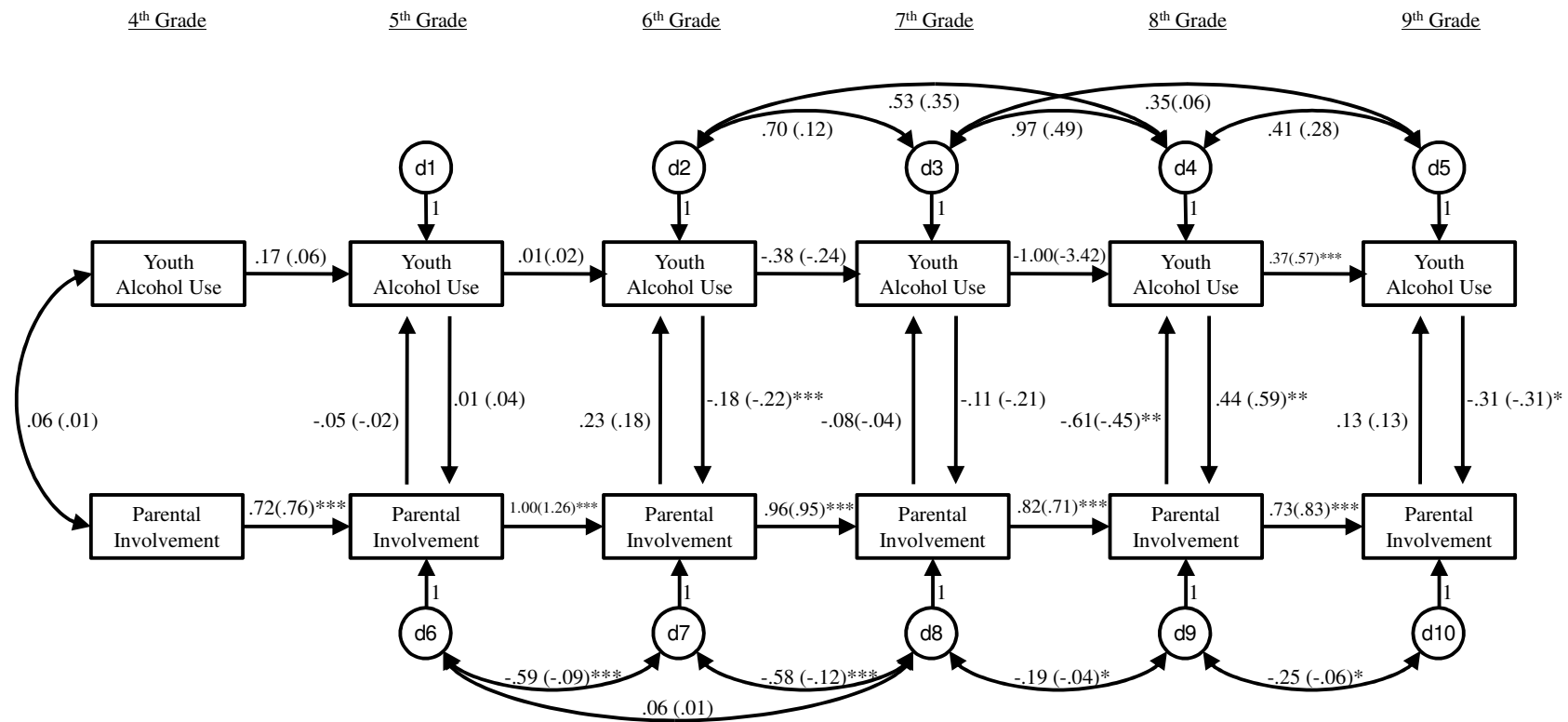


Figure 6. Final nonrecursive within time path model relating youth alcohol use and parental involvement.

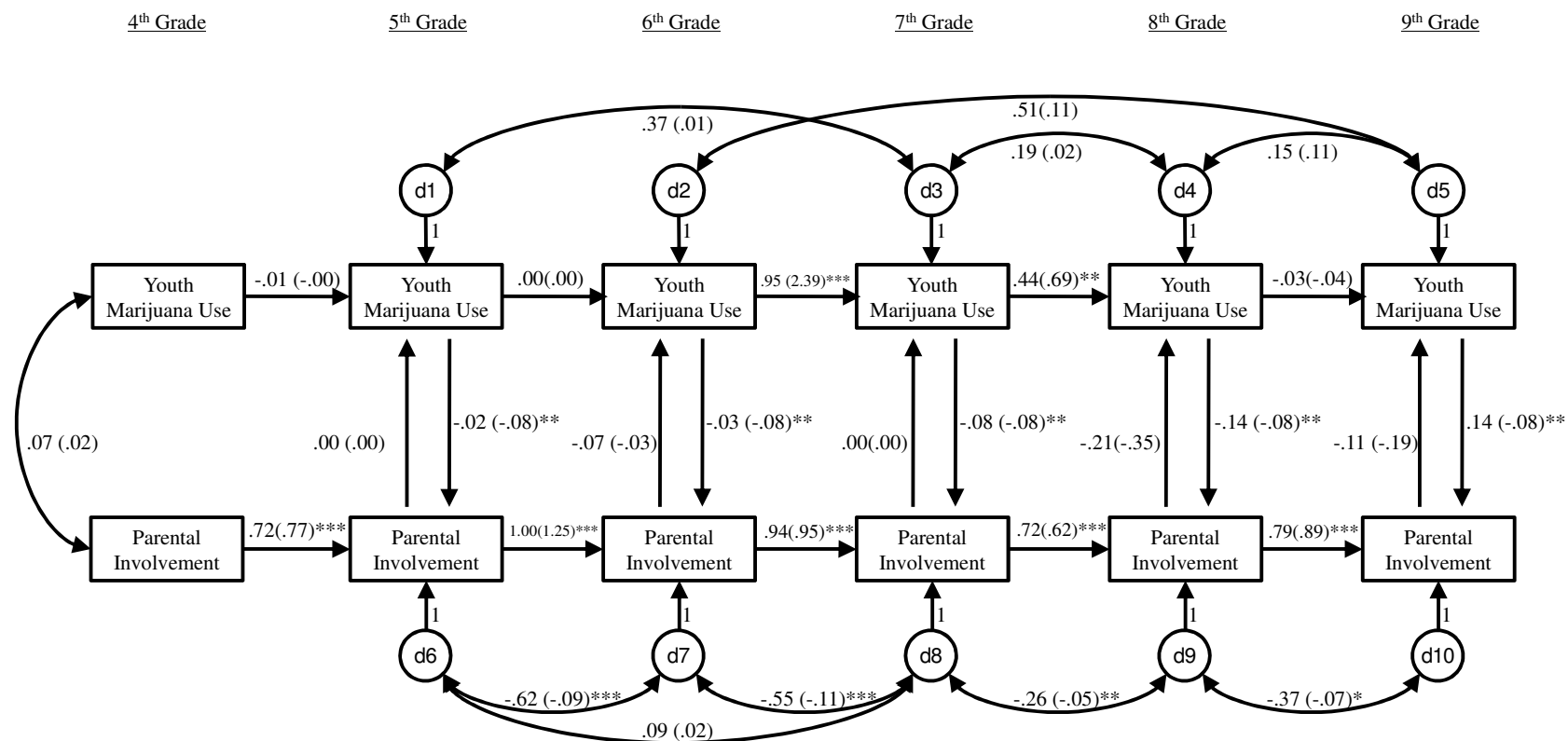


Figure 7. Final nonrecursive within time path model relating youth marijuana use and parental involvement.

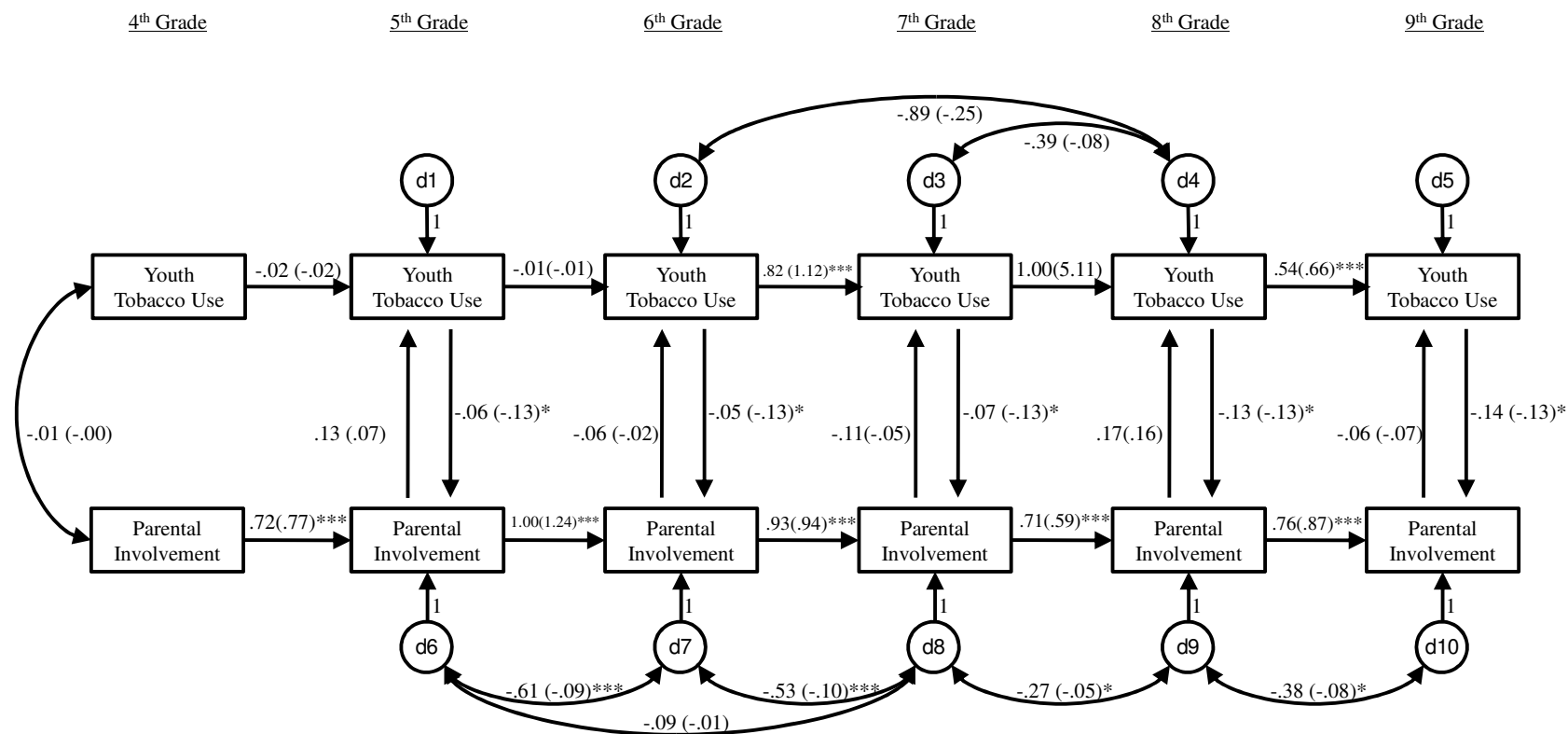


Figure 8. Final nonrecursive within time path model relating youth tobacco use and parental involvement.

Appendix C: Measures

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PARENTING PRACTICES (Parent)

DIRECTIONS: "The following questions have to do with the kinds of things that you and your child may have talked about or have done together in the past year."

(Interviewer: Please fill in the bubbles as completely as possible.)

1. When was the last time that you discussed with your child his/her plans for the coming day?
 - ☐ Don't know
 - ☐ Within the last week
 - ☐ More than 1 month ago
 - ☐ Yesterday/Today
 - ☐ Within the last month

2. In the past 12 months, about how often have you discussed with your child his/her plans for the coming day?
 - ☐ Don't know
 - ☐ At least once a week
 - ☐ Less than once a month
 - ☐ Almost every day
 - ☐ At least once a month

3. When was the last time you talked with your child about what he/she had actually done during the day?
 - ☐ Don't know
 - ☐ Within the last week
 - ☐ More than 1 month ago
 - ☐ Yesterday/Today
 - ☐ Within the last month

4. In the past 12 months, about how often have you talked with your child about what he/she had actually done during the day?
 - ☐ Don't know
 - ☐ At least once a week
 - ☐ Less than once a month
 - ☐ Almost every day
 - ☐ At least once a month

5. Does (TC) have a set time to be home on school nights?
 - ☐ No set time
 - ☐ Sometimes set time
 - ☐ Always set time

6. Does (TC) have a set time to be home on weekend nights?
 - ☐ No set time
 - ☐ Sometimes set time
 - ☐ Always set time

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	Hardly Ever	Sometimes	Often
7. Does your child help with family fun activities?	☐	☐	☐
8. Does he/she like to get involved in such family activities?	☐	☐	☐
9. How often do you have time to listen to your child when he/she wants to talk to you?	☐	☐	☐
10. Do you and your child do things together at home?	☐	☐	☐
11. Does your child go with members of the family to the movies, sports events, or other outings?	☐	☐	☐
12. How often do you have a friendly talk with your child?	☐	☐	☐
13. Does your child help you with chores, errands, and/or other work?	☐	☐	☐
14. Do you talk with your child about how he/she is doing in school?	☐	☐	☐
15. If you or other adults are not at home, does your child leave you a note or call you to let you know where he/she is going?	☐	☐	☐
16. Do you know who (TC's) companions or friends he/she is with when he/she is not at home?	☐	☐	☐
17. When you are not at home, does your child know how to get in touch with you?	☐	☐	☐
18. When you and your child are both at home, do you know what he/she is doing?	☐	☐	☐

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DIRECTIONS: "In the past 12 months, when your child did something that you liked or approved of, how often did you?"

(Interviewer: Please fill in the bubbles as completely as possible.)

	Hardly Ever	Sometimes	Often
19. Give him/her a wink or a smile?	☐	☐	☐
20. Say something nice about it; praise or give approval?	☐	☐	☐
21. Give him/her a hug, pat on the back, or a kiss for it?	☐	☐	☐
22. Give him/her some reward for it, like a present, extra money, or something special to eat?	☐	☐	☐
23. Give him/her a special privilege such as staying up late or doing some special activity?	☐	☐	☐
24. Do something special together, such as going to the movies, to a game, playing a game, or going somewhere?	☐	☐	☐

25. On the average, how much time are you together with your child on weekdays, that is, when you and your child are both awake?

- ☐ Less than 30 minutes a day ☐ 3 to 6 hours
☐ 30 minutes to 1 hour ☐ More than 6 hours
☐ More than 1 hour, but less than 3

26. And on **weekend** days?

- ☐ Less than 30 minutes a day ☐ 3 to 6 hours
☐ 30 minutes to 1 hour ☐ More than 6 hours
☐ More than 1 hour, but less than 3

27. On **weekdays**, how much of that time are you doing something together, like making something, playing a game, talking, or going out together, but not just watching TV?

- ☐ Less than 30 minutes a day ☐ 3 to 6 hours
☐ 30 minutes to 1 hour ☐ More than 6 hours
☐ More than 1 hour, but less than 3

28. And on **weekend** days?

- ☐ Less than 30 minutes a day ☐ 3 to 6 hours
☐ 30 minutes to 1 hour ☐ More than 6 hours
☐ More than 1 hour, but less than 3

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29. If your child did not come home by the time that was set, would you know?
- ☐ No, or very unlikely
 - ☐ Probably
 - ☐ Certainly
30. When your child is out, do you know what time he/she will be home?
- ☐ No, or very unlikely
 - ☐ Probably
 - ☐ Certainly
31. Is it important to you to know what your child is doing when he/she is outside of the house?
- ☐ No, not important
 - ☐ Yes, somewhat important
 - ☐ Yes, very important

DIRECTIONS: "The following questions ask about where your child is when he/she is not in school."
(Interviewer: Please fill in the bubbles as completely as possible.)

32. Where does your child usually go after school?
- ☐ Don't know
 - ☐ Somewhere else, supervised
 - ☐ Somewhere else, unsupervised
 - ☐ Home supervised
 - ☐ Home, unsupervised
33. Where is your child usually in the evening?
- ☐ Don't know
 - ☐ Somewhere else, supervised
 - ☐ Somewhere else, unsupervised
 - ☐ Home supervised
 - ☐ Home, unsupervised
34. Where is he/she usually on the weekends?
- ☐ Don't know
 - ☐ Somewhere else, supervised
 - ☐ Somewhere else, unsupervised
 - ☐ Home supervised
 - ☐ Home, unsupervised
35. Is the discipline you use effective for your child? (Does it work?)
- ☐ Not Really
 - ☐ Half of the time
 - ☐ Usually
36. If your child is punished, does the punishment work?
- ☐ Not Really
 - ☐ Half of the time
 - ☐ Usually

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DIRECTIONS: "With these next questions, please tell whether you ALMOST NEVER, SOMETIMES, or OFTEN feel this way about your child."

(Interviewer: Please fill in the bubbles as completely as possible.)

	Almost Never	Sometimes	Often
37. If you punish your child, does his/her behavior get worse?	☐	☐	☐
38. Do you hesitate to enforce the rules with your child because you fear he/she might harm someone in your household?	☐	☐	☐
39. Do you feel that you must be careful not to upset your child?	☐	☐	☐
40. Do you feel that other family members must be careful not to upset your child?	☐	☐	☐
41. Do you feel that it is more trouble than it is worth to ask your child to help you?	☐	☐	☐
42. Do you think that your child will take it out on other children if you try to make him/her obey you?	☐	☐	☐
43. When you are by yourself, do you have much difficulty controlling your child?	☐	☐	☐
44. When other adults are present, do you have much difficulty controlling your child?	☐	☐	☐
45. Do you leave your child alone because of his/her moodiness?	☐	☐	☐
46. Do you think that your child will try to get back at you if you try to make him/her obey you?	☐	☐	☐

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CSAP YOUTH SURVEY

Introduction: "These questions ask about how young people feel about alcohol, tobacco, and other drugs, and whether they use them. I would like for you to answer all of the questions honestly and thoughtfully. Remember, your answers will be kept strictly confidential, so no one in your school or community will ever know how you answered these questions. This is not a test, so there are no right or wrong answers. Please stop me if you have any questions at any time."

Directions: "The first few questions are about CIGARETTES, CHEWING TOBACCO, SNUFF, OR DIP, including Redman, Levi Garrett, Beechnut, Skoal, Skoal Bandits, or Copenhagen. Please respond according to the choices I will read to you."

1. On how many DAYS in the LAST MONTH (30 days) did you smoke a cigarette? For example, if you smoked a cigarette each weekend night, that would be 8 days (4 weekends times 2 days each weekend).

- ☐ None
- ☐ 1 or 2 days in the last month
- ☐ 3 to 5 days in the last month
- ☐ 6 to 9 days in the last month
- ☐ 10 to 19 days in the last month
- ☐ 20 to 31 days in the last month

2. On the days you smoke cigarettes, how many do you smoke?

- ☐ Less than 1 cigarette
- ☐ 1 or 2 cigarettes
- ☐ 3 to 7 cigarettes
- ☐ About half a pack of cigarettes
- ☐ A pack or more of cigarettes
- ☐ I don't smoke cigarettes

3. On how many days in the last month (30 days) did you use chewing tobacco, snuff or dip?

- ☐ None
- ☐ 1 or 2 days in the last month
- ☐ 3 to 5 days in the last month
- ☐ 6 to 9 days in the last month
- ☐ 10 to 19 days in the last month
- ☐ 20 to 31 days in the last month

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4. On the days you used chewing tobacco, snuff or dip, how many times did you use it?
- ☐ Less than once
 - ☐ 1 or 2 times
 - ☐ 3 to 7 times
 - ☐ 8 to 12 times
 - ☐ More than 12 times
 - ☐ I don't use chewing tobacco, snuff or dip
5. Have you EVER SMOKED a cigarette, even just a few puffs, or used chewing tobacco, snuff or dip?
- ☐ No
 - ☐ Yes
6. Do you think your best friend smokes cigarettes or uses chewing tobacco, snuff or dip sometimes?
- ☐ No
 - ☐ Yes
7. If your friends found out that you smoked cigarettes or used chewing tobacco, snuff or dip, how do you think they'd feel?
- ☐ They would approve
 - ☐ They would disapprove but still be my friends
 - ☐ They would disapprove and stop being my friends
 - ☐ They wouldn't care
8. How would your parents feel if they found out you smoked cigarettes or used chewing tobacco, snuff or dip sometimes?
- ☐ They would not be upset at all
 - ☐ They would be a little upset
 - ☐ They would be pretty upset
 - ☐ They would be very upset

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Directions: "The next few questions are about ALCOHOL. By alcohol, we mean beer, wine, wine coolers, grain alcohol, or hard liquor. Please respond according to the choices I will read to you."

9. On how many DAYS in the LAST MONTH (30 days) did you have an alcoholic drink?

- ☐ None
- ☐ 1 or 2 days in the last month
- ☐ 3 to 5 days in the last month
- ☐ 6 to 9 days in the last month
- ☐ 10 to 19 days in the last month
- ☐ 20 to 31 days in the last month

10. On the days you drink alcohol, about how many drinks do you have? (By a drink, we mean a can of beer, a glass of wine, a wine cooler, or a shot of hard liquor.)

- ☐ Less than a drink
- ☐ 1 drink
- ☐ 2 drinks
- ☐ 3 drinks
- ☐ 5 or more drinks
- ☐ I don't drink alcohol

11. Have you EVER had a drink of alcohol?

- ☐ No
- ☐ Yes

12. Do you think your best friend drinks alcohol sometimes?

- ☐ No
- ☐ Yes

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13. If your friends found out that you drank alcohol sometimes, how do you think they'd feel?

- ☐ They would approve
- ☐ They would disapprove but still be my friends
- ☐ They would disapprove and stop being my friends
- ☐ They wouldn't care

14. How would your parents feel if they found out you drank alcohol sometimes?

- ☐ They would not be upset at all
- ☐ They would be a little upset
- ☐ They would be pretty upset
- ☐ They would be very upset

Directions: "The next few questions are about MARIJUANA, sometimes called dope, grass, weed, pot, smoke, hash, jones, spleef, joint, doobee, herb, sen, sezz, stick, stone, ganja, or cannabis. Please respond according to the choices I will read to you."

15. On how many DAYS did you use any marijuana in the LAST MONTH (30 days)?

- ☐ None
- ☐ 1 or 2 days in the last month
- ☐ 3 to 5 days in the last month
- ☐ 6 to 9 days in the last month
- ☐ 10 to 19 days in the last month
- ☐ 20 to 31 days in the last month

16. On the days you use marijuana, how many times do you use it?

- ☐ Once a day
- ☐ Twice a day
- ☐ 3 or more times a day
- ☐ I don't use marijuana

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17. Have you EVER TRIED marijuana?

- ☐ No
☐ Yes

18. Do you think your best friend uses marijuana sometimes?

- ☐ No
☐ Yes

19. If your friends found out that you used marijuana sometimes, how do you think they'd feel?

- ☐ They would approve
☐ They would disapprove but still be my friends
☐ They would disapprove and stop being my friends
☐ They wouldn't care

20. How would your parents feel if they found out you used marijuana sometimes?

- ☐ They would not be upset at all
☐ They would be a little upset
☐ They would be pretty upset
☐ They would be very upset

Directions: "The last few questions on this questionnaire are about INHALANTS. Inhalants are substances that you breathe in to get high, such as amyl and butyl nitrite (sometimes called poppers, snappers, rush, or hardware) or glue, aerosol sprays, gasoline or lighter fluids, ether, correction or cleaning fluids. (Inhalants are sometimes called huff, sniff, whiteout, and whippets.) Please respond according to the choices I will read to you."

21. On how many DAYS did you use any inhalants in the LAST MONTH (30 days)?

- ☐ None
☐ 1 or 2 days in the last month
☐ 3 to 5 days in the last month
☐ 6 to 9 days in the last month
☐ 10 to 19 days in the last month
☐ 20 to 31 days in the last month

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22. During the last 30 days, have you used any of the following on your own, that is, without a doctor telling you to take them? (Answer *yes* if you have used the drug in the past thirty days, *no* if you have not.)

NO YES

- | | | |
|-----------------------|-----------------------|--------------------------|
| ☐ | ☐ | Cocaine or Crack Cocaine |
| ☐ | ☐ | Heroin or Opium |
| ☐ | ☐ | LSD or Acid |
| ☐ | ☐ | Speed or Uppers |
| ☐ | ☐ | Zaladine |
| ☐ | ☐ | Downers or Tranquilizers |
| ☐ | ☐ | PCP or Angel Dust |
| ☐ | ☐ | Ecstasy |

23. Pretend your best friend offered you a cigarette and you did not want it. How hard would it be to say "no"?

- ☐ Not hard at all
- ☐ Not very hard
- ☐ Pretty hard
- ☐ Very hard

24. Pretend your best friend offered you a drink of beer or wine and you did not want it. How hard would it be to say "no"?

- ☐ Not hard at all
- ☐ Not very hard
- ☐ Pretty hard
- ☐ Very hard

25. Pretend your best friend offered you some marijuana and you did not want it. How hard would it be to say "no"?

- ☐ Not hard at all
- ☐ Not very hard
- ☐ Pretty hard
- ☐ Very hard

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26. Pretend your best friend offered you some cocaine or some other drug and you did not want it.
How hard would it be to say "no"?

- ☐ Not hard at all
- ☐ Not very hard
- ☐ Pretty hard
- ☐ Very hard

Curriculum Vita

Sara Elkins is a doctoral student at the University of Tennessee. Her research interests focus on externalizing problems in childhood and adolescence, parenting practices, peer influence, and treatment outcome studies.