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The Role of Multiple Dimensions of Organized Activity Participation, Impulsivity, and Parental Monitoring on Externalizing Behavior among Low-Income, Urban Adolescents.

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THE ROLE OF MULTIPLE DIMENSIONS OF ORGANIZED ACTIVITY PARTICIPATION, IMPULSIVITY AND PARENTAL MONITORING ON EXTERNALIZING BEHAVIOR AMONG LOW-INCOME, URBAN ADOLESCENTS

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TABLE OF CONTENTS

LIST OF TABLES iv

LIST OF FIGURES v

ABSTRACT vii

CHAPTER ONE: INTRODUCTION 1

CHAPTER TWO: THEORY 8

CHAPTER THREE: PARENTAL MONITORING 14

CHAPTER FOUR: ORGANIZED ACTIVITY INVOLVEMENT. 23

CHAPTER FIVE: THE CURRENT STUDY 34

CHAPTER SIX: METHODS
- Participants 36
- Missing Data Analysis 39
- Sample Size and Power 40
- Procedure 40
- Measures 42

CHAPTER SEVEN: RESULTS
- Univariate and Bivariate Calculations 48
- Data Analysis Plan 53
- Model 1. Intensity of Organized Activity Participation Predicting Externalizing Behaviors 55
- Model 2. Summer Program and Breadth of Organized Activity Participation Predicting Externalizing Behaviors 62
- Model 3. Duration of Organized Activity Participation Predicting Externalizing Behaviors 67
- Model 4. Multiple Dimensions of Organized Activity Participation Predicting Externalizing Behaviors 73

CHAPTER EIGHT: DISCUSSION 81

REFERENCE LIST 98

VITA 123

LIST OF TABLES

Table 1. Descriptive Statistics for Full Sample and Low- and High Risk Externalizing Groups 48

Table 2. Bivariate Correlations for Full Sample (n=278) 50

Table 3. Bivariate Correlations for Low-Risk Group (n=140) 51

Table 4. Bivariate Correlations for High-Risk Group (n=138) 52

Table 5. Results of Overall Model Fit of Organized Activity Intensity, Parental Monitoring, and Impulsivity, Predicting Externalizing Behaviors and Measurement Invariance Analyses between High- and Low-Risk Subsamples 60

Table 6. Results of Overall Model Fit of Organized Activity Breadth, Parental Monitoring, and Impulsivity, Predicting Externalizing Behaviors and Measurement Invariance Analyses between High- and Low-Risk Subsamples 66

Table 7. Results of Overall Model Fit of Organized Activity Duration, Parental Monitoring, and Impulsivity, Predicting Externalizing Behaviors and Measurement Invariance Analyses between High- and Low-Risk Subsamples 71

Table 8. Results of Overall Model Fit of Multiple Dimension of Organized Activity Participation, Parental Monitoring, and Impulsivity, Predicting Externalizing Behaviors and Measurement Invariance Analyses between High- and Low-Risk Subsamples 78

LIST OF FIGURES

Figure 1. Conceptual Model 35

Figure 2. Flow of Participants for Final Dataset 38

Figure 3. Results of Impulsivity, Parental Monitoring, and Organized Activity Intensity Predicting Adolescent Externalizing Behaviors: Overall Model 57

Figure 4. Results of Impulsivity, Parental Monitoring, and Organized Activity Intensity Predicting Adolescent Externalizing Behaviors: High-Risk Subsample 61

Figure 5. Results of Impulsivity, Parental Monitoring, and Organized Activity Intensity Predicting Adolescent Externalizing Behaviors: Low-Risk Subsample 62

Figure 6. Testing the Model Fit of the Adolescent Externalizing Behaviors and Substance Use from Impulsivity, Parental Monitoring, and Organized Activity Breadth: Overall Model 63

Figure 7. Testing the Model Fit of the Adolescent Externalizing Behaviors and Substance Use from Impulsivity, Parental Monitoring, and Organized Activity Breadth: High-Risk Subsample 66

Figure 8. Testing the Model Fit of the Adolescent Externalizing Behaviors and Substance Use from Impulsivity, Parental Monitoring, and Organized Activity Breadth: Low-Risk Subsample 67

Figure 9. Testing the Model Fit of the Adolescent Externalizing Behaviors and Substance Use from Impulsivity, Parental Monitoring, and Organized Activity Duration: Overall Model 68

Figure 10. Testing the Model Fit of the Adolescent Externalizing Behaviors and Substance Use from Impulsivity, Parental Monitoring, and Organized Activity Duration: High-Risk Subsample 72

Figure 11. Testing the Model Fit of the Adolescent Externalizing Behaviors and Substance Use from Impulsivity, Parental Monitoring, and Organized Activity Duration: Low-Risk Subsample 73

Figure 12. Testing the Model Fit of the Adolescent Externalizing Behaviors and Substance Use with Multiple Dimensions of Organized Activity Participation: Overall Model 75

Figure 13. Testing the Model Fit of the Adolescent Externalizing Behaviors and Substance Use with Multiple Dimensions of Organized Activity Participation: High-Risk Subsample 79

Figure 14. Testing the Model Fit of the Adolescent Externalizing Behaviors and Substance Use with Multiple Dimensions of Organized Activity Participation: Low-Risk Subsample 80

ABSTRACT

Because the majority of teenage deaths are not due to illness, but instead attributed to risk behaviors, it is pertinent to determine under what circumstances adolescents are likely to injure themselves or others. One well-studied protective factor of adolescent externalizing behaviors is participation in organized activities. Unfortunately, the majority of research involving adolescents' engagement in organized activities examines single dimensions of participation (intensity, duration, and breadth) at a time, within samples of middle-class, Caucasian youth. Few studies have examined how multiple dimensions of participation in organized activities, including how uninterrupted engagement in organized activities from school year to summer months, simultaneously protects against engagement in substance use and externalizing behavior for low-income, ethnically diverse adolescents.

This study utilizes self-report from a sample of 278 ethnic-minority adolescents and parents across late adolescence (*m*=16.88, *sd*=.44). The overall goals of this project are 1) to examine how different patterns of participation in organized activities uniquely and simultaneously predict substance use and externalizing behaviors, above and beyond impacts of impulsivity and parental monitoring, and 2) to test the measurement and structural invariance of these relations between a low-risk and high-risk subsample of youth who engage in externalizing behaviors. Results indicate few individual impacts of organized activity participation, with the exception of breadth of participation among a low-risk subsample. Additionally, parental monitoring and impulsivity remained significant predictors of externalizing and substance use

behaviors only within the high-risk subsample, while in the low-risk subsample only impulsivity remained a significant predictor. The findings of this study contribute to the knowledge regarding when and under what circumstances adolescents engage in risk behaviors, as well as what factors are important to prevent them from occurring.

CHAPTER ONE

INTRODUCTION

It is widely recognized that the developmental stage of adolescence brings about complex biological, social, and cognitive changes. Although there are no definitive events that mark the boundaries of adolescence, the development of secondary sex organs during puberty often signifies the beginning (Spear, 2011), while the transition to more independent social roles (i.e. starting college, career, or marriage) often signifies the end (Arnett &Taber, 1994). Adolescents are able to navigate the responsibility that comes with increases in autonomy through more adept understanding of abstract representations (Kaminski & Sloutsky, 2012), increased capabilities to integrate new evidence into existing beliefs or knowledge (Chapman, Gamino, & Mudar, 2012), and improved executive functioning (Atkins, Bunting, Bolger, & Dougherty, 2012). Further evidence of better cognitive and social competencies includes the maturation of brain regions associated with problem solving and reward sensitive decision-making (Roenneberg et al., 2004).

Despite growing cognitive abilities, increased social responsibilities, and being the life stage associated with peak physical strength and health, adolescence is paradoxically a time of heightened morbidity and preventable death (Kelley, Schocet, & Landry, 2004). The primary cause of death among adolescents clearly demonstrates this point. Compared to children and adults, the biggest contributor of adolescent mortality is not disease or illness, but rather unintentional injuries, suicide, and assaults (Heron, 2015). Behaviors that contribute to physical health risks, such as substance use and externalizing behaviors, have large-scale impact for

families, neighborhoods, and society beyond the tragedies of early or preventable deaths. For example, adolescents who use alcohol or drugs are at a much higher risk to be hospitalized due to accidental substance-related injuries (Linkis, Chun, Mello, & Baird, 2009), traumatic violence (Sheppard, Snowden, Baker, & Jones, 2008), or intentional self-inflicted injuries (Cultler, Flood, Dreyfus, Ortega, & Kharbanda, 2015).

In particular, adolescents who come from families or communities of low socioeconomic status may be at a greater risk to engage in health-relevant behaviors due to their lack of familial and community resources (Bradley & Corwyn, 2002; Brooks-Gunn & Duncan, 1997). In the United States, 36% of African American youth and 31% of Hispanic youth live in poverty compared to 12% of Caucasian and 13% of Asian American youth (Kids Count Data Center, 2017). Youth who are exposed to early poverty (before the age of 6) are particularly at risk to engage in later problem behavior (Mazza, Lambert, Zunzunegui, Tremblay, Boivin, & Côté, 2017). In a meta-analysis of 66 studies, Hawkins and colleagues (2000) found family socioeconomic status (SES) between ages 6-11 had stronger effect sizes in predicting serious delinquency in adolescence and young adulthood compared to family SES at ages 12-14. Further evidence demonstrates that even when ethnic minority youth engage in lower levels of substance use compared to their Caucasian or more affluent counterparts, they are more likely to come into contact with the criminal justice system (Coley, Sims, Dearing, & Spielvogel, 2017; Sickmund & Puzzanchera, 2014). Therefore, it is crucial to understand the patterns of low-income adolescents' engagement in substance use and externalizing behaviors, as well as ways to reduce or prevent these behaviors from occurring, in order to protect youth from the physical, social, and economic consequences of involvement in the juvenile justice system.

Beyond the consequences resulting from disproportionate contacts that low-income youth have with the juvenile justice system, early and prolonged substance use also impacts biological and psychological functioning, including greater cognitive deficits (Brown & Tapert, 2004; Guerri & Pascual, 2010; Squeglia, Jacobus, & Tapert, 2009; Zeigler et al., 2005), reduced hippocampal volume (Brown & Tapert, 2004; Guerri & Pascual, 2010), and impaired gray and white matter (Squeglia et al., 2009; Wilson, Malon, Thomas, & Iacono, 2015). Early drinking is also associated with poorer attention, verbal memory, and visuospatial abilities, and lower levels of executive functioning (Brown & Tapert, 2004; Nguyen-Louie et al., 2015; Squeglia et al., 2009). Less is known about the cognitive delays associated with marijuana use, although some researchers have begun to study the brains of marijuana-using teens. The strongest evidence concludes that long-term and chronic marijuana use is also related to altered white matter development (Gruber, Dahlgren, Sagar, Gonenc, & Lukas, 2014; Jacobus et al., 2015; Luciana & Ewing, 2015) and issues with impulsivity, working memory, and attentional coordination (Schweinsburg, Brown, & Tappert, 2008). Finally, chronic marijuana use is also associated with poorer academic abilities and externalizing behaviors during adolescence (Meier, Hill, Small, & Luthar, 2015), and internalizing issues and fewer close relationships during adulthood (Epstein, Hill, Bailey, & Hawkins, 2013).

As a result of widespread public awareness campaigns, some risk behaviors that carry serious health consequences, such as rates of high-risk sexual behaviors and driving under the influence of alcohol have decreased significantly over the past few decades (Steinberg, 2008). However, rates of adolescent substance use and delinquency have remained high, with the majority of adolescents report engaging in at least one type of deviant behavior by the time they

graduate high school (Institute of Medicine (IOM) & National Research Council (NRC), 2010; Steinberg, 2008). Delaying adolescent's engagement with substance use and externalizing behavior can have long-term effects. For example, studies have shown for every year the initiation of alcohol and drugs is delayed, a 14% and 5% reduction in future dependence is found, respectively (Grant & Dawson, 1997; Grant & Dawson, 1998).

While overall prevalence rates of risk taking behaviors such as drinking, taking illicit drugs, and committing serious violent crimes have been steadily *decreasing* over the past decade (Center for Disease Control and Prevention, 2015; Federal Interagency Forum on Child and Family Statistics, 2015; Vaughn, Nelson, Salas-Wright, Oian, & Schootman, 2016), a significant percentage of adolescents still engage in risky behaviors at some point before such behaviors are legal (Moss, Chen, & Yi, 2014; Schweinsburg et al., 2008). For example, the Monitoring the Future study, which has continuously surveyed adolescents since the 1970s, found monthly rates of alcohol consumption peaked in the 1980s, with 72% of adolescents reported drinking in the last month (Johnston, O'Malley, Miech, Bachman, & Schulenberg, 2016) and have steadily declined from the 1990s onward (Brooks-Russell, Farhat, Haynie, & Simons-Morton, 2014). The most recent survey found 35% of 12th graders have consumed an alcoholic beverage in the past 30 days (Johnston et al., 2016). Unfortunately, consumption rates of marijuana, the most common illicit drug among adolescents, have shown the opposite pattern. Prevalence rates increased sharply during the 1990s and have remained stable since 2010, at a prevalence rate of 24% monthly use (Johnston et al., 2016). Rates of monthly cigarette users have declined substantially (Johnston et al., 2016), although "e-cigarettes" are gaining popularity under the assumption of a safer alternative to traditional tobacco products (Wills et al., 2015).

When predicting which individuals will develop later abuse or dependency issues, the patterns and initiation of substance use behavior may be more important than the overall prevalence of consumption (Institute of Medicine & National Research Council, 2011). Prevalence rates of drinking, smoking, and marijuana use are found to increase linearly from age 12 to 18 (Andrade, 2013; Cleveland, Feinberg, & Jones, 2012; Johnston et al., 2016; Rai ete al., 2003). Mid-adolescence, between the ages of 14-16, is the most common age to initiate and experiment with alcohol and other substances, while the highest rates of engagement occur during late adolescence and into young adulthood (Dovovan, 2004; Monahan, Rhew, Hawkins, & Brown, 2013; Rai et al., 2003). Although it is not yet determined whether early substance use serves as a marker or a precursor of future dependence, drinking and marijuana use during adolescence can be an indicator of later alcohol abuse or dependence in adulthood (DeWit, Adlaf, Offord, & Ogborne, 2000), and predict experimentation with more illicit drug use later on (Moss et al., 2014).

One clear indicator of the rise in adolescent's externalizing behaviors are rates of aggression and delinquency, which can be observed in rates of juvenile criminal involvement. Unlike the linear progression of substance use across adolescence, the age-crime curve depicts adolescent’s delinquency rates increasing from age 12, peaking around ages 16-17, and then decreases back to pre-pubertal levels during young adulthood (Abar, Jackson, & Wood, 2014; Jacob & Lefgren, 2003; Loeber & Farrington, 2014; Mercer, Keijers, Crocetti, Branje, & Meeus, 2016). Across studies, over 80% of adolescent participants report at least some involvement in minor delinquency, such as taking things that do not belong to them or breaking into buildings (Chen & Adams, 2010; Hair, Park, Ling, & Moore, 2009; Mercer et al., 2016; Willoughby et al.

2007). A small percentage of adolescents engage in more serious delinquency. For example, 17% of all serious violent crimes are perpetrated by least one juvenile offender (Federal Interagency Forum on Child and Family Statistics, 2015). Adolescents who engage in early, prolonged, or serious acts of aggression, are more likely to continue to exhibit antisocial behaviors in adulthood and have subsequent involvement in the criminal justice system (Moffitt, Caspi, Harrington, & Milne, 2002). Although the majority of adolescents commit small acts of delinquency, there are potential long-term consequences including the initiation of substance use (Briere, Fallu, Morizot, & Janosz, 2014; Maslowsky, Schulenberg, & Zucker, 2014; Trucco, Colder, & Wieczorek, 2011). For example, for each additional unit of increase in delinquency, the odds of the adolescent getting arrested rises by 83% (Makarios, Cullen, & Piquero, 2015). Further, higher levels of delinquency are associated with reductions in high-school completion and college enrollment, and increased likelihood of risky sexual behaviors, teen pregnancy, and future welfare dependence (Makarios et al., 2015). Thus, the importance of examining the initiation and patterns of substance use and delinquency is clear for predicting who is at greatest risk for long-term consequences.

In addition to understanding what ages adolescents are likely to engage in delinquency, examining peak hours in which juveniles engage in delinquency can elucidate effective prevention strategies. Unlike adult criminal activity, which peaks later in the evening, adolescent criminal activity is most likely to occur between 3 and 4 p.m. on school days and holds a stable pattern during non-school days (Sickmund & Puzzanchera, 2014). The patterns of time-use during the out-of-school hours contribute to the gaps in achievement and increases in problem behaviors for low-income adolescents (Wolf, Aber, & Lawrence, 2015). It is well established

that low-income adolescents spend less time in supervised activities compared to middle- and high-income youth (Pedersen & Seidman, 2005). Thus, environments that prevent adolescents from engaging in delinquency in the immediate hours following school, such as organized activities, could be more effective at preventing risk behaviors than juvenile curfew policies (Sickmund & Puzzanchera, 2014).

For these reasons, there is a great need to examine the protective factors against types of behaviors that pose health risks or detriments to others. The purpose of this study, therefore, is to examine how participation in organized activities, a common protective factor, predicts youth engagement in substance use and externalizing behaviors over time. Specifically, this study examines how different patterns of organized activity involvement (including intensity, breadth, and duration of participation) impact adolescent externalizing and substance use behaviors over time, while controlling for other selection factors related to organized activity involvement and engagement in risky behaviors, namely, parental monitoring, impulsivity, and demographic characteristics.

CHAPTER TWO

THEORY

In many cases when presented with high or low risk options, adolescents are capable of making logical and reasonable decisions (Casey & Caudle, 2013). Compared to young children, adolescents have increased processing and reasoning speed (Ferrer et al., 2013; Reyna et al., 2012), in part because their brains refine connections through neuronal pruning and improves efficiency of neural conductivity with increased myelin production (Squeglia et al., 2009). In gambling studies in which participants are presented with a choice between a smaller but more likely option and a larger but less likely option, adolescents significantly outperform younger participants in order to receive larger payouts by the end of the experiment (Christakou et al., 2013). Similarly, in go-no-go tests of self-control, as long as no emotionally salient or socially rewarding stimuli are used, adolescents perform as well or better than adults (Casey & Caudle, 2013). It is only when the context of the experiment is altered to includes an emotionally-arousing element, such as the presence of a peer, that adolescents begin to choose riskier options more frequently (Albert, Chein, & Steinberg, 2013; Galván, 2012). This over-ruling of the analytic, top-down system of cognitive control by the dopaminergic system of reward seeking is referred to as the dual-process model of adolescent risk-taking. The premise of the dual-process model centers on the imbalance between adolescent's fully developed limbic system which processes possible risks and rewards to a given outcome, and the still developing prefrontal cortex which is critical for self-regulation and decision making (Blakemore & Robbins, 2012;

Galván, 2012; Spear, 2011; Steinberg, 2010).

According to the dual-process model, adolescents may struggle with behavioral or emotional control not because of overwhelming hormones, but because their brains are primed to respond to incentives related to ongoing biological and chemical changes related to sensation seeking and desire for pleasurable stimuli (Bjork, Lynne-Landsman, Sirocco, & Boyce, 2012; Spear, 2000). For example, the adolescent brain shows a more enhanced response in brain regions that respond to the brain's excitatory neurotransmitter, NMDA, and smaller responses from the brain's inhibitory neurotransmitters, the GABA system (Guerri & Pascual, 2010; Spear, 2011). Additionally, the levels of dopamine in the nucleus accumbens and striatum during adolescence suggest the reward circuitry in the brain's mesocorticolimbic system makes certain types of stimuli more motivating for teens than adults (Guerri & Pascual, 2010). Additionally, adolescents might be more vulnerable to risk behaviors because they feel more of the euphoric effects of substances, while not suffering negative effects of sedation, loss of limb coordination, or next day hangovers (Siqueira, et al., 2015; Spear, 2011).

The ability to control dominant impulses or delay gratification and instead engage in less pleasurable behaviors in the pursuit of a goal increases with age (Gratz & Roemer, 2004; Tice & Bratslavsky, 2000), and is related to better academic and social outcomes (Bandura, Caprara, Barbaranelli, Gerbino, & Pastorelle, 2003). This type of behavioral regulation can be thought of two separate components: impulsivity, the on-the-spot decisions for an immediately rewarding stimuli with little thought about consequences, and sensation-seeking, in which a person deliberately seeks out novel or risky options in pursuit of pleasure (Bjork et al., 2012; Maloney, Grawitch, & Barber, 2012, Nigg, 2017). Sensation-seeking is found to peak in adolescence and

decline in adulthood and is thought to be a normative part of teenage years, whereas impulsivity is thought of as a more stable, trait across the lifespan (Bjork et al., 2012; Steinberg, 2008). In line with the dual systems theory, impulsivity includes both bottom-up processes such as emotional salience and reward-sensitivity related to limbic system activitation, and top-down processes such as preventing or interrupting the dominant response, and basing decisions on previous goals (Nigg, 2017).

As expected, higher sensation-seeking and impulsivity are both associated with increased risk (Khurana, Romer, Betancourt, Brodsky, Giannetta, & Hurt, 2015; Mirman, Albert, Jacobson, & Winston, 2012; Neumann, Barker, Koot, & Maughan, 2010; Voisin, Hotton, Tan, & DiClemente, 2013; Weichold, Wiesner, & Silbereisen, 2014). Sensation seeking stems from a person's inability to regulate their own behaviors in order to seek out pleasurable stimuli, or indulging in risks for the sake of the experience. However, sensation seeking may be more related to novel, health-related risk behaviors, such as high-risk sexual behaviors or risky driving (Mirman et al., 20102; Voisin et al., 2010), whereas impulsivity is thought to relate more to the *behavioral disinhibition* involved in substance use and delinquency. Importantly, impulsivity in this regard relates to the *context* in which adolescents decide to engage in risk behaviors due to the presence of the immediate reward "in the moment", rather than preemptive deliberation. On the other hand, sensation seeking is not reflective of the failure or weakness of executive control in the presence of emotionally salient or tempting stimuli, and therefore may be less strongly related to engagement in unhealthy behaviors (Khurana et al., 2015). In a metaanalysis of studies of personality traits related to emotion regulation and risky decision making, reward sensitivity had a smaller association with alcohol use, while "urgency traits" such as making

impulsive decisions under negative or positive emotional states was found to be related to problematic alcohol use (Stautz & Cooper, 2013).

Further, adolescence who rate themselves lower on impulse control are more likely to try alcohol at an early age (Mason & Spoth, 2012), and have higher rates of alcohol use one year later (O'Connor, & Colder, 2015). In one of the only long-term longitudinal studies, Epstein, Hill, Bailey and Hawkins (2013), examined how engaging in risk taking and disregarding consequences at ages 13 to 18 predicted comorbid problem behaviors (substance dependence or abuse, criminal involvement or high-risk sexual behaviors) when the participant was 33. Their results revealed impulsivity predicted adulthood comorbid problem behavior above and beyond all other predictors of family environment, while adolescent antisocial behaviors was not significantly associated with adult problem behaviors. Given that impulsivity is implicated in long-term risk behaviors, more research is needed that examines how impulsivity predicts adolescent substance use and externalizing behaviors especially while examining settings with various levels of external reinforcements of behavioral control (i.e. environments with higher levels of adult supervision and control) in which impulsivity may play a smaller role.

While the dual-process model is based upon neuroscience research, Moffitt's (1993) developmental taxonomy of antisocial behavior also highlights the imbalance between biological and social maturity as the root cause of the majority of delinquent acts committed during adolescence. Moffitt's taxonomy posits that adolescent risk behaviors are reinforced as fun and engagement in risk behaviors leads to increased sense of competence and self-esteem (Galván, 2012; Kelley et al., 2004; Spear, 2000). Moffitt proposed that while the majority of delinquency engaged in by adolescents is normative, the adolescents that do not engage in delinquent acts

typically have some internal characteristic or external reason to resist the temptation to engage in delinquency.

It is easy to imagine why unsupervised time might provide more opportunities for adolescents to engage in more socially rewarding, deviant behaviors (Bjork et al., 2012). Parents may counteract the increased motivation to behave recklessly with stricter management strategies or by arranging for the adolescent to be in some form of supervised care, although access to activities like organized activities may be limited for low-income families (Mahoney, 2011; Parente et al., 2012). One framework that proposed how organized activities provide the internal and external supports to protect against risky behavior is positive youth development. Positive youth development partially grew from social-ecological system and the developmental systems theories (Sapienza & Masten, 2011), and as such examines multiple levels of context that influence adolescent development, including individual characteristics, immediate and proximal influences, and larger cultural and historical norms (Larson & Tran, 2014; Lerner & Galambos, 1998).

Although it can be discussed as either a developmental process or outcome, positive youth development is most consistently discussed as a paradigm related to characteristics of organized activities (Hamilton, Hamilton, & Pittman, 2004; Lerner, Lerner, Bowers, & Geldhof, 2015). Because there is less demand for academic achievement compared to school curriculum, organized activities tend to emphasize the resiliency and potential of adolescents as "resources to be developed, rather than problems to be solved" (Damon, 2004; Roth, Brooks-Gunn, Murray, & Foster, 1998). A prominent perspective that captures the key tenets of positive youth development is Lerner's Five C's- competence, confidence, character, compassion, and

connection (Bowers et al., 2010; Lerner et al., 2005). The Five C's scale has been shown to be related to reductions in externalizing behavior, drug use, unsafe sex, as well as the promotion of components related to "thriving" such as leadership, service, helping others and delay of gratification for youth who attend summer and afterschool programs (e.g. Jelicic, Bobek, Phelps, Lerner, & Lerner, 2007; Lerner et al., 2005).

It is almost impossible to say all adolescents will have similar experiences in organized activities, but rather *it depends* on many combinations within integrated systems in which the adolescent is placed. The developmental systems theory emphasizes that a child is not just being influenced by these systems, but these systems are also influenced by the child's own characteristics. Strategies used by parents to control children's behavior is often bidirectional, in that increased levels of youth-reported levels of delinquency predicted lower levels of parental knowledge about youth behavior in the following years (Dishion, Nelson, & Bullock, 2004; Kerr, Stattin, & Burk, 2010; Laird, Pettit, Bates, & Dodge, 2003). For example, young children who are diagnosed with oppositional defiant disorders and conduct problems, have shown that poor parent-child communication, decreased involvement, and lower levels supervision by parent during adolescence were all predicted by more disruptive behaviors during childhood, indicating a bidirectional relation between child characteristics and parenting strategies (Burke, Pardini, & Loeber, 2008). Therefore, the goal of this study is to examine a balance of both opportunities that increase adolescent's capabilities to inhibit behavioral responses to risk behavior (such as greater involvement in organized activities, and active strategies of parental monitoring), as well as an indicator of still developing brain processes through measurement of impulsivity.

CHAPTER THREE

PARENTAL MONITORING

Unsupervised Time

A substantial literature has documented the protective factor of supervised time for adolescents. Unsupervised time with peers in combination with low levels of parental monitoring has been associated with current and future externalizing behavior, particularly for youth who live in low income or unsafe neighborhoods (Pettit, Bates, Dodge, & Meece, 1999). Other surveys of adolescent care-arrangement have established a link between unsupervised time with peers or siblings in the immediate hours after school and increases in substance use, delinquency, and aggression (Flannery, Williams, & Vazsonyi, 1999). A study by Lee and Vandell (2015) which examined longitudinal data from the National Institute of Child Health and Human Development Study of Early Child Care and Youth Development (NICHD SECCYD), found more unsupervised time with peers across high school was associated with increased odds of trying alcohol, marijuana, or tobacco, as well as increased rates of consumption of all three substances.

Parental Monitoring

Although behavioral differences have been found between youth who spend more time in unsupervised activities and those who spent more time supervised, the difference disappears among adolescents who report that their parents consistently know what they are doing while they are unsupervised (Richardson et al., 1993). Attempts track children's activities when they

are not under parent's supervision are labeled as parental monitoring (Guilamo-Ramos, Jaccard, & Dittus, 2010). This definition emphasizes actions taken by parents before inappropriate behavior has occurred such as rule setting, through steps to learn about current behaviors such as starting conversation to learn more about their child's social experiences, successes, or problems, and finally actions that occur after behavioral transgressions such as determining whether stricter parental control is necessary (Guilamo-Ramos et al., 2010).

The relationship between time spent unsupervised and substance use and externalizing behaviors may also be impacted by adolescent's levels of impulsivity to engage in risky behavior. For example, parents who rate their children's impulsivity as high may feel less comfortable leaving their adolescents unsupervised for more time per week (Hadley, Houck, Barker, & Senocak, 2015). Other studies have found indirect relations between parental monitoring and adolescent delinquency through youth's self-reported self-control (Finkenauer, Engels, & Baumeister, 2005), as well as evidence that parental monitoring moderates the relation between impulsivity and drug and alcohol use (Leeman et al., 2014). Additionally, parental monitoring may be particular protective in reducing rates of delinquency and substance use among low-income, ethnic minority adolescents (Marotta & Voison, 2017).This research can help to parents and policy makers by predicting which groups of adolescents are most likely to be influenced during unsupervised time and help to design interventions to neutralize these contexts.

The established literature suggests parental monitoring decreases the likelihood of unsafe activities or unhealthy behaviors (e.g. Barber, Stolz, Olsen, Collins, & Burchinal, 2005; DiClemente et al., 2001; Hartos, Beck, & Simons-Morton, 2004; Huang, Murphy, & Hser, 2011;

Lohman & Billing, 2008). Parental monitoring has also been found to promote positive aspects of development (Guilamo-Ramos et al., 2010) such as higher levels of school connectedness (Dotterer, Lowe, & McHale, 2014), higher self-esteem (Parker & Benson, 2004), identity development (Sartor & Youniss, 2002) and has a positive bi-directional relation with prosocial behaviors (Padilla-Walker, Carlo, Christensen, & Yorgason, 2012). Studies of parental knowledge of children's whereabouts and activities have been shown to be more predictive of adolescent's self-reported externalizing behaviors compared to other strategies to keep children out of trouble, such as consistency of discipline, reinforcement of prosocial behaviors, parental warmth, and parent-child problem solving abilities (Hemovich, Lac, & Crano, 2011; Patterson & Stouthamer-Loeber, 1984).

Two papers by Kerr and Stattin (2000a, 2000b) emphasize that while parental strategies to control unsupervised adolescent behavior have been of interest to researchers for decades, much of the past research has relied on measures that are dependent upon youth disclosure. One possible critique of past studies of parental monitoring therefore, is the relationship found between monitoring and delinquent behaviors might be only spuriously associated because the most delinquent youth have the most to hide (and therefore disclose the least) to their parents. Longitudinal studies of monitoring have challenged this possibility. For example, studies of parental knowledge of adolescent's activities during age 12 to13 independently predicted delinquency at age 16 to 17 above and beyond youth's initial reports of delinquency (Lahey, Van Hulle, D'Onofrio, Rodgers, & Waldman, 2008). In another longitudinal study, adolescents who report parents knowing where they are most of the time were less likely to report drinking 12 months later even after controlling for initial drinking rates and other risky-contexts (Beck,

Boyle, & Boekeloo, 2004). Finally, effective parenting knowledge in pre-adolescence has been found to be protective against alcohol, marijuana and tobacco use up to 5 years later when controlling for initial rates of use (Cleveland, Gibbons, Gerrard, Pomery, & Brody, 2005).

Kerr & Stattin (2000a, 2000b) instead argue that while youth disclosure is important, other valuable monitoring strategies include parent solicitation, accuracy of parental knowledge, and parental control. An examination of the multiple dimensions of parental monitoring shows that each component can be correlated to other components (Bean, Barber, & Crane, 2006; Kerr & Stattin, 2000). For example, in a sample of high-risk, low-income youth and their parents, child disclosure to parents and more time spent with parents was related to reduced antisocial behavior and higher school grades through increases in parental knowledge (Criss, Shaw, Moilanen, Hitchings, & Insgoldsby, 2009). In a separate study, mother's solicitation had a bidirectional relationship with adolescent disclosure, which in turn predicted lower levels of adolescent delinquency (Keijsers, Branje, VanderValk, & Meeus, 2010).

The concept of parental knowledge about child's activities and whereabouts is inherently related to adolescent disclosure, such that while parents may think they know what their child is doing when not in parent's supervision, this is dependent on how truthful adolescents are with parents. Multiple informers of parental monitoring can show differences regarding extent of parental knowledge. For example, parents are more likely to overestimate the knowledge they have of adolescent's activities compared to adolescent reports of parental knowledge (Cottrell et al., 2003). Parents are also much more likely to under-estimate adolescent risk behaviors, especially when parents believe their child is at low-risk, such as doing well in school, attending religious services, or participate in the PTA (Stanton et al., 2000; Yang et al., 2006). Thus,

adolescent reports of parental monitoring are more predictive of actual substance use and risk behavior than parent-report alone (Abar, Jackson, Colby, & Barnett, 2014; Cottrell et al., 2003). Changes in levels of parental knowledge can also be impactful, such that more fluctuations in knowledge is predictive of more adolescent alcohol, tobacco, externalizing and internalizing problems at later ages while consistent, high rates of parental knowledge predicts smaller increases in heavy drinking and marijuana use over time (Abar et al., 2014; Lippold, Fosco, Ram, & Feinberg, 206). Unfortunately, as adolescents get older and rates of heavy drinking and drug use increase, parents are less likely to know their child's whereabouts (Abar et al., 2014; Richards et al., 2004). Further research on the impact of short-term monitoring strategies and its impact on alcohol consumption over shorter periods of time is necessary to determine the stability and contexts of abstinence (Laird, Marrero, & Sherwood, 2010).

While past literature (prior to Stattin and Kerr's papers on the dimensions of parental monitoring) often reflected adolescent disclosure rather than actual parental knowledge, studies that explicitly differentiate between disclosure and parental knowledge have found strong correlations between child disclosure, parental knowledge, and reduced problem behavior (Ryan, Miller-Loessi, & Nieri, 2007; Smetana, 2008; Soenens, Vansteenkiste, Luyckx, & Goosens, 2006). For example, adolescents who freely socialize on the Internet with little supervision and purposely withhold information from parents, are more likely to cyber-bully others (Goldstein, 2015). However, adolescents and parents differ on what parents have the right to know about different types of teen activity (Smetana, 1988), and as such, teens be more willing to disclose information about how teens spend their money or free time, and more likely to conceal information about romantic, risky, or sexual behaviors (Rote & Smetana, 2016).

While less research has focused on the strategies parents use to solicit information from their children (Kerr & Stattin, 2000), studies of parent-child communication have shown that more open communication and trust facilitate parental monitoring and adolescent behaviors (Ehrlic, Richards, Lejuez, & Cassidy, 2015; Guilamo-Ramos et al., 2010). The history and quality of parent-child relationships influences day-to-day monitoring. Relationships that are based on caring and interest of the parent promote compliance by the adolescent, whereas poorer quality relationships feel more like an intrusion to the adolescent. Similarly, poorer parental-child attachment (both from childhood and during adolescence) indirectly relates to adolescent substance uses and externalizing problems through associations with decreased parental knowledge (Jones, Ehrlich, Lejuez, & Cassidy, 2015; Sitnick, Shaw, & Hyde, 2014; Vries, Hoeve, Stams, & Asscher, 2015). Adolescent disclosure about where they are going on the nights and weekends and more open parent-child communication has also been show to predict lower rates of drinking and deviance in Black and White families (Barnes, Farrell, & Banerjee, 1994). A breakdown in parental solicitation, through impaired communication between parents and adolescents, such as lying, avoidance, secrecy or parental "snooping", is related to amount of less disclosure about daily activities and substance use (Hawk, Becht, & Branje, 2016; Rote, Smetana, Campione-Barr, Villalobos, & Tasopoulos-Chan, 2012).

Parental control encompasses actions that attempt to restrict or direct children's behaviors. Control strategies are more one-sided than other components of parental monitoring. Despite many boundaries and expectations that parents and youth can mutually agree upon, parents of teenagers feel that adolescence is still a stage where their relationship is hierarchical (Guilamo-Ramos et al, 2010). While parents become more permissive with drinking or have

fewer consequences for teens that drink alcohol (Pardini, Loeber, & Stouthamer-Loeber, 2005; Zehe & Colder, 2014), there is still debate whether parents need to adjust their strategies for behavioral control to prevent antisocial behaviors. For example, parents who show more tolerance for externalizing behaviors predicts youth's increased involvement with more delinquent peers (Pardini et al., 2005). Explicit rules against drinking have been shown to decrease adolescent drinking, binge drinking, and intentions to drink even after controlling for peer influences (Schwinn & Schinke, 2014). Despite parental behavioral control predicting fewer adolescent-reported externalizing behaviors, both currently and one year later (Barber, 1996; Barber, Olsen, & Shagle, 1994), some studies have demonstrated that parental over-control may backfire (Tilton-Weaver, Burk, Kerr, & Stattin, 2013). Adolescents who believe that their parents act in over-controlling ways are more likely to place greater priorities on friendships above home or school life (Fuligini & Eccles, 1993). Further, parents who express disapproval in friendships can be related to an increased likelihood of selecting delinquent friends (Keijsers et al., 2012).

Finally, parents' own characteristics can also influence the amount of monitoring they provide and their offspring's subsequent behaviors. Parental monitoring is constrained by work responsibilities and employment, such that for parents who work full time jobs, monitoring may be more effective as to prevent externalizing and sexual behavior (Jacobson & Crockett, 2000). High levels of parental monitoring in areas that have high levels of poverty are more protective against externalizing behaviors compared to areas that are not as impoverished (Andrade, 2013; Lahey et al., 2008; Pettit et al., 1999). Among parents that work low-paying jobs or irregular hours, economic hardships can predict the amount of monitoring a parent utilizes or is capable of

giving. Parents may not have energy or opportunity to solicit information from their children if they work in afternoons or evening shifts, or if they feel stress, depression or fatigue following from a long day of work. For example, economic hardship can predict parental distress and negative parenting, which are related to adolescent externalizing problems and alcohol use (Gutman, McLoyld, & Tokoyawa, 2005; Hardaway & Cornelius, 2014). Economic strain might also impact how parent's choose to discipline their children, with parents under more financial strain resorting to more inconsistent punishments for rule-breaking, which leads to more delinquency and drug use (Lempers, Clark-Lempers, & Simons, 1989). Families with high socioeconomic status (SES) may be better equipped to respond to negative adolescent behaviors, while low SES families have more withdrawn responses (Chen & Berdan, 2006).

Family composition and ethnicity has played a role in predicting parental monitoring strategies. Single parent families have long been thought to rely more on monitoring techniques. However, studies have shown that youth in single parent homes do not differ significantly in how they spend their leisure time (Price et al., 2010), nor does single-parenthood necessarily mean less emotional support (Zimmerman, Salem, & Maton, 1995). Families who experience divorce or families with step-parents have also been characterized as more punishing, chaotic and less supportive, (Garbarino, Sebes, & Schellenbach, 1984) and subsequently have children with more externalizing and antisocial behaviors (Burt, Barnes, McGue, & Iacono, 2008; Kim, Hetherington, & Reiss, 1999). Further African American adolescents girls are more likely to report lower levels of parental monitoring compared to European American adolescent girls (Blustein et al., 2015). In turn, the African American girls who reported low parental monitoring were at greater risk for early substance use. However, other studies have shown Black parents

have more strict guidelines about substance use and clearer consequences for engaging in substance use compared to White parents, thus Black adolescents who experience environments with high levels of parental monitoring in high-risk neighborhoods may be more protected compared to their White peers who reside in low-risk neighborhoods (Skinner, Haggerty, & Catalano, 2009). Studies comparing African American and Hispanic parental monitoring have found no significant differences between the two groups (Dillon, Pantin, Robbins, & Szapocznik, 2008).

CHAPTER FOUR

ORGANIZED ACTIVITY INVOLVEMENT

Involvement in organized activities, a term that covers school-based extracurricular programs and community-based organizations, has been shown to prevent adolescent risk behaviors for low-income, urban youth (Fredricks & Simpkins, 2013). According to the positive youth development framework, activities that are voluntary, directed by adults, and promote skill building serve as protective resources against adolescent risk taking (Catalano, Berglund, Ryan, Lonczak, & Hawkins, 2004; Eccles & Gootman, 2002; Mahoney, Larson, Eccles, & Lord, 2010). Overall, youth who enjoy their programs, feel interested, challenged, and have close relationships with staff at their program report higher levels of engagement and belonging, which relates to more positive outcomes (Akiva, Cortina, Eccles, & Smith, 2013; Fredricks, Bohnert, & Burdette, 2014; Greene, Lee, Constance, & Hynes, 2013). While there is evidence that organized activities have the most positive outcomes for lower achieving and low-income adolescents, many low-income families face logistical and economic barriers that prevent enrolling their children in programming (Casey, Ripke, & Huston, 2010; Hall, Yohalem, Tolman, & Wilson, 2004; Goerge & Chaskin, 2004; McCombs, et al. 2011; Pedersen & Seidman, 2005). When youth do enroll, there is considerable evidence that low-income adolescents benefit from organized activity participation (Posner & Vandell, 1999; Vandell, Larson, Mahoney, & Watts, 2015).

Reviews of organized activity involvement have generally shown that compared to youth who do not participate in any type of organized activities, participants to report better academic and social outcomes, such as higher levels of academic achievement, better psychological adjustment, increased positive social behaviors, and lower levels of internalizing symptoms and problem behaviors (e.g. Durlak, Weissberg, & Pachan, 2010; Eccles & Gootman, 2002; Farb & Matjasko, 2012; Mahoney, Harris, & Eccles, 2006; Ramey & Rose-Krasnor, 2012). However it should be noted that, certain types of activity participation have been associated with negative impacts. For example, programs that specifically target anti-social or high-risk youth, often result in more problem behaviors due to the aggregation of other youth reinforcing such behaviors (e.g. Dishion & Tipsord, 2011; Dishion, McCord, & Poulin, 1999; McCord, 1992). Activities that lack structure and adult direction, such as community centers were youth are encouraged to "hang out" with no planned activities are associated with increased delinquent behavior and substance use (Coley, Morris, & Hernandez, 2004; Mahoney, Stattin, & Lord, 2004).

Due to the mixed nature of the impacts of organized activity participation, studies that only conceptualize participation as a dichotomous "yes or no" category may lead to misleading interpretations regarding the benefits of organized activities (Bohnert, Fredricks, & Randall, 2010). A growing number of researchers have demonstrated that examining different dimensions of organized activity participation elucidates different developmental impacts (Simpkins, Little, & Weiss, 2004). For example, Busseri and Rose-Krasnor (2009) demonstrated unique developmental impacts of participating in a greater diversity of activities, referred to as organized activity breadth, and organized activity intensity, the impacts the general quantity of overall organized activity participation regardless of activity type. Although the positive impacts

of organized activities does not seem to be moderated by age (Mahoney & Vest, 2012), the length of time in which an adolescent has participated in activities, referred to as organized activity duration, has also been shown to be related to more positive outcomes for older adolescents who have greater opportunities to accumulate competencies in organized activity settings (Fredricks & Eccles, 2006b). While each dimension of organized activity participation has been linked to different developmental outcomes, to my knowledge, only one study has examined how the different dimensions are interconnected (Buserri & Rose-Krasnor, 2010).

Therefore, it is vital to examine multiple dimensions of organized activity participation in order to understand the complexity of adolescent experiences. As Bohnert and colleagues (2010) point out, few studies utilize multiple dimensions of organized activity participation, and how the combinations of these dimensions interact. For example, breadth of participation may appear to have a larger impact on adolescent outcomes because it is confounded by intensity effects. Additionally, few studies of organized activity participation among low-income, ethnic minority adolescents incorporate multiple dimensions of participation (Camacho & Fuligini, 2015; Fredricks & Eccles, 2006; Marsh & Kleitman, 2002). Therefore, this study aims to examine the individual and interconnected dimensions of organized activity participation on adolescent externalizing behavior and substance use.

Intensity of Participation

Beyond evidence that demonstrate any level of participation is related to more positive outcomes (Camacho & Fulingni, 2015; Mahoney & Vest, 2012), studies have found higher frequency of participation (measured either as total hours per week in each activity or as a general frequency scale of participation) is predictive of levels of academic and social outcomes

and lower levels of substance use and risk behaviors (Bohnert et al., 2010; Bohnert & Garber, 2007; Darling, 2005; Denault & Poulin, 2009; Fredricks & Eccles, 2006b; Gardner, Roth, & Brooks-Gunn, 2008; Rose-Krasnor, Busseri, Willoughby, & Chalmers, 2006). This is an important distinction between the dichotomous "yes/no" category of participation because the amount of time youth spend in organized activities per week varies widely (especially when comparing frequencies of low-income and middle-income samples). For example, studies using largely White, middle-class samples have shown on average adolescents spend about five hours a week in organized activities between two or three activities (Fredricks, 2011; Mahoney et al., 2006), while samples of African American youth have reported averages of about two hours per week (Dotterer, et al., 2007). This may stem from parenting differences reported in low-income and middle-class samples. In addition to financial barriers that low-income families face, middle class parents commonly report enrolling their children in activities that are customized to their child's interests and abilities, while low-income parents report choosing activities based on safety and opportunities for economic mobility (Bennet, Lutz, & Jayaram, 2012).

Despite the variety in frequency levels, in general, more time spent per week in organized activities is related to greater developmental benefits. This may simply be because youth who spend more time in supervised settings spend less time in unsupervised and unstructured contexts and thus have fewer opportunities to engage in risk behaviors (Osgood, O'Malley, Bachman, & Johnston, 1996). Further, more frequent participation in any organized activity, regardless of the type of activity, provides more exposure to the positive youth development resources that predict reductions in risk behaviors and increased civic engagement (Flanagan, Kim, Collura, & Kopish, 2015; Lerner et al., 2005). For example, youth who participate in community-based prosocial

programs, such as community service clubs, report as a result of their participation their supportive network of peers and adults grew, they learned problem-solving skills as part of a team, and had opportunities to explore their own identity relative to their wider community (Flanagan et al., 2015).

Importantly, more frequent participation in organized activities has been shown to be protective against maladaptive psychological symptoms and behaviors. For example, in a nationally representative sample, intensity of organized activity participation across adolescence was predictive of emotional and social well-being during young adulthood, even after controlling for prior levels of well-being and demographics (Mahoney & Vest, 2012). Further, the benefits of organized activity participation may serve as reinforcement for increased involvement in activities. In a sample of 240 adolescents considered at-risk for psychopathy, lower levels of participation in organized activities was related to higher levels of internalizing symptoms, which in turn predicts even lower involvement at the end of high school (Bohnert, Kane, & Garber, 2008). In particular, more time spent in extracurricular activities has been shown to be related to higher levels of school self-esteem and school bonding for African American youth (Dotterer, McHale, & Crouter, 2007).

Therefore, the dosage of activity participation, as captured by intensity levels, provides more opportunities for youth to spend supervised by adults. According to dual-process models, this reduces adolescent's opportunities to engage in risk behaviors by placing them in fewer contexts in which risk behaviors are taking place. This study incorporates two factors related to adult supervision, intensity of organized activity involvement and levels of parental monitoring, which may lead to a better understanding of ways to prevent adolescent engagement in risk

behaviors. Further, this study explores the patterns of intensity of participation among low-income adolescents, who traditionally have less access to school- and community-based activities.

Breadth of Participation

Over time adolescents show declines in intensity and breadth of activity participation, although intensity declines faster than breadth of participation (Denault & Poulin, 2009). Exploring the breath of activity participation has been proposed to capture the unique activity-related growth that occurs across settings (Hansen, Larson, & Dworkin, 2003). Similar to the theoretic benefits of more intense activity participation, engaging in multiple types of activities presents opportunities for adolescents explore different aspects of their identity, strengthen connections with peers and adults, and to gain different competencies (Flanagan et al., 2015; Bohnert et al., 2010). For example, the physical skills learned in sports activities may be quantitatively and qualitatively different than competencies gained in prosocial or community service activities. Breath scores have consistently been linked to better developmental outcomes in diverse samples of adolescents, including indicators of positive youth development such as well-being, academic orientation, and interpersonal functioning (Busseri, Rose-Krasnor, Willoughby, & Chalmers, 2006). For example, greater breadth of participation predicted increased GPA and school belongingness in a sample of immigrant youth living in Los Angeles (Camacho & Fuligni, 2015).

However, diversity in activity participation has also been linked to nonlinear impacts, such that adolescents who participate in the greatest number of activity contexts show detrimental outcomes. In a longitudinal study that followed 1,480 adolescents from 7th to 11th

grade, Fredricks and Eccles (2010), found greater breadth of participation in organized activities was negatively related to concurrent levels of alcohol and marijuana use, and negatively related to parent's report of externalizing behavior over time. Although this result seems to support the "over-scheduling" hypothesis, the relation between breadth of activity involvement and academic achievement only showed negative outcomes for participants who reported engaging in 6 or more different types of activities, suggesting the threshold for diminishing returns on breadth of participation is relatively high (Fredricks & Eccles, 2010). It is also worth noting curvilinear relations have been found in as few as 4 activity domains, with higher levels of academic outcomes and school belongingness found in adolescents who participated in two domains compared to youth in fewer or more activity types (Knifsend & Graham, 2012).

Additionally, reviews of breadth of participation have suggested that breadth reduces substance use among adolescents but may be unrelated to externalizing behaviors (Bohnert et al., 2010). For example in an examination of the breadth of activity involvement participation of 927 youth from Grades 7 to 12, youth who were more likely to participate in a broad range of activities showed higher composite indicators of positive youth development, but few differences across waves for levels of risk behavior. The exception to this finding was in grade 12, in which the higher participation group had lower rates of substance use compared to youth with narrower ranges of participation, and across waves, participants in the higher participation group reporting higher average depression scores (Agans, Champine, DeSouza, Mueller, Johnson, & Lerner, 2014). This finding is consistent with past literature which found higher levels of breadth participation linked to higher levels of depressive symptoms (Randall & Bohnert, 2009), and may point to higher levels of breadth increasing likelihood of detrimental effects, although this

pattern has not been found in relation to externalizing behavior and substance use (Mahoney & Vest, 2012).

In sum, breadth of activity participation has been shown to be beneficial to a certain extent during adolescence. It appears that adolescents benefit from at least attending 2 different categories of activity participation, while attending multiple categories may interfere with psychological functioning and increase levels of internalizing symptoms. However, it is not yet clear, whether similar patterns will exist when predicting levels of substance use and externalizing behaviors, particularly among youth who are at greater risk to engage in such behaviors.

Duration of Participation

Finally, the duration of participation is thought to capture adolescent's length of time or stability in organized activities. Few studies to date have examined how different levels of participation in organized activities changes over the course of the full calendar year (Bohnert et al., 2010; Mahoney, Cairns, & Farmer, 2003; Zaff, Moore, Papillo & Williams, 2003). However, it still remains an important dimension in organized activity participation for multiple reasons. For example, relationships with peers and adults and skill sets that are gained through participation may take multiple months or years to build. Additionally, lengthier participation over multiple years may reflect increased interest and commitment to participate at more specialized levels of organized activities (Bohnert et al., 2010).

In line with the dimensions of intensity and breadth, increased duration in participation, compared to occasional or inconsistent levels of participation, has been linked to more positive developmental outcomes (Mahoney et al., 2003; Zaff et al., 2003). For example, cumulative

participation in organized activities across 3 years of high school was found to be predictive of less marijuana and other drug use and more positive academic outcomes even after controlling for selection factors among a large sample of California youth (Darling, 2005). A study by Gardner, Roth & Brooks-Gunn (2008) found that youth who participated in 2 years of organized activities had higher levels of postsecondary educational attainment and greater odds of volunteering and voting 8 years after high school compared to youth who participated for 1 year and youth with no participation. Further, duration of participation across high school predicted lower levels of problematic alcohol use and depression in males one year post high school, even after controlling for prior levels of adjustment.

However, the study by Gardner and colleagues (2008) examined duration as a function of school-time participation and did not account for any summertime activities, thus one or two year of participation actually reflects only nine or eighteen months of participation respectively. Although past research has demonstrated that the risk of externalizing behaviors decrease as adolescents spend more time supervised during afterschool time, less is known about the cumulative effects of unsupervised time during the school year and summer months (Bohnert, Ward, Burdette, Silton, & Dugas, 2014; Light, Rusby, Nies, & Snijders, 2014; Mahoney, 2011; Parente, Sheppard, & Mahoney, 2012). To date, only one study has examined how various summer care arrangements impact the behaviors of adolescents (Parente et al., 2012). Parente and colleagues (2012) found although only a third of adolescents participated in organized activity over the summer months, those that were had higher levels of emotional well-being, academic scores, and lower levels of externalizing behaviors and BMI during the following school year. These results are parallel to studies of organized activities that take place during the

school year, which find only a small percentage of all children participate in after-school programs and adolescents are much more likely to not attend or drop out of organized activities (Osgood, Anderson, & Shaffer, 2010; Pedersen & Seidman, 2005; Persson, Kerr & Stattin, 2007). Importantly, the results of the study also indicated parental knowledge partially mediated the relation between organized activity participation and positive outcomes, and this relationship was moderated for older adolescents and those who were routinely left in self-care, meaning that organized activity participation was especially beneficial for these youth.

Therefore the understanding of how duration of participation is limited, but promising. While studies have linked longer duration in organized activities as protective, engagement in specific organized activity types over time may be harmful. For example, participation in team-sport activities is commonly associated with increased alcohol consumption, but decreases in tobacco and marijuana use (Eccles & Barber, 1999; Bartko & Eccles, 2003; Denault, Poulin, & Pedersen, 2009; Kwan, Bobko, Faulkner, Donnelly, & Cairney, 2014). Therefore, longer engagements in sport-team activities may actually increase adolescent substance use and externalizing behaviors, particularly if they are exposed to older peers as they join more competitive teams.

In sum, the goal of this study is to examine how unique dimensions of organized activity participation impact adolescent risk behaviors. This study will elucidate whether protective relations between dimensions are found in a sample of low-income, ethnic minority, urban youth. To date, few studies have examined multiple dimensions of activity participation on adolescent risk behaviors, and only one has demonstrated how multiple dimensions may be interconnected to predict adolescent behavior. This study contributes to the literature regarding the complexities

of adolescent experiences, as well as whether dimensions show linear or nonlinear benefits among underserved adolescents.

CHAPTER FIVE

THE CURRENT STUDY

Thus, this study has three main aims. The first aim is to discover the levels of externalizing behaviors and substance use among a sample of low-income, ethnic minority adolescents from predictors including individual dimensions of organized activity involvement, parental monitoring, and levels of impulsivity. This contributes to the general knowledge about adolescent behaviors, specifically the engagement in risk behaviors across late adolescence among an understudied population who is at greater risk for externalizing behaviors and substance use. Secondly, this study examines the contribution of multiple dimensions of organized activities involvement as a protective factor in reducing externalizing behaviors and substance use through multiple dimensions of participation (see Figure 1). The results of these analyses further clarifies the relation between organized activity involvement and risk behaviors for low-income youth. Finally, this study examines whether the measures and relations between factors differ as a function of earlier risk-engagement, in order to determine if individual indicators or pathways between variables are interpreted differently or are more meaningful for high- and low-risk subsamples.

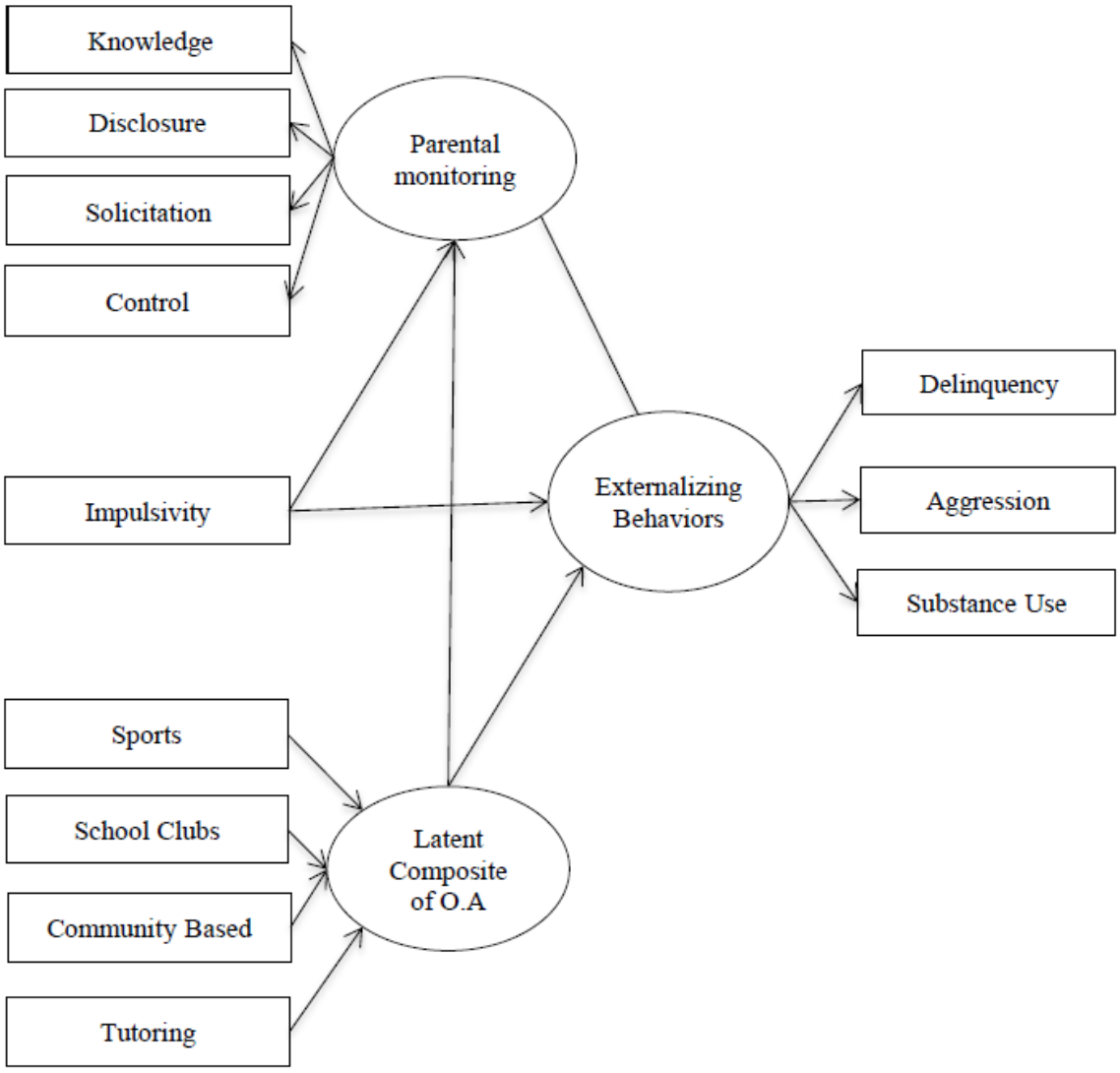

Figure 1. Conceptual Model

CHAPTER SIX

METHODS

Participants

Participants come from The Schools and Families Educating (SAFE) Children Study, an intervention for 424 kindergarten students and their primary caregivers with the stated goals of improving academic success for children, reduce antisocial behaviors over time, and promote protective parenting factors (Henry, Tolan, Gorman-Smith, Schoeny, Zwanziger, & Kim, 2012). In the initial sample, 51.2% of the recruited children were female (n=217). The sample also primarily consisted of ethnic minority families, with 42.5% of children classified as African American (n=180), 52.8% classified as Mexican or Hispanic American (n=224), and the remaining classified as European American or other (n=20). For this study, participant data was used from Wave 10, collected when participants were 16 to 18 years old (n=308, *M*= 16.9 *SD*=.45) and Wave 11, when participants were 17 to 19 (n=312, *M* =18.13 *SD*=.62).

To be included in the study, adolescents had to complete Waves 10 and 11 interviews, and have caregiver data from Wave 10. This reduced the sample size from the initial sample size of 424, to 291 participants. Additionally, 13 more participants were dropped who were not attending school during Wave 10, reducing the final sample size for this study to 278 participants (see Figure 2). In line with the initial demographics of the SAFE Children study, the final sample has slightly more 151 (54.1%) adolescent females than males. Additionally, the final sample had slightly more Hispanic/Latinx participants (n=145) than African American

participants (n=133). On average the sample was 16.88 years old (*sd*=.44) at Wave 10 and was 18.08 (*sd*=.61) at Wave 11.

At Wave 10, Caregivers were on average 41.81 years old (range: 32-50+, *sd*=5.25). 168 caregivers reported being married or living with a partner at Wave 10, while 110 reported not being married or living with a partner. Further, there was a wide variance in how much schooling caregivers had received- 37 (13.3%) caregivers reporting having under 7 years of schooling, 31 (11.2%) received 7-9 years of schooling, 56 (20.1%) had a high school diploma, 69 (24.8%) had some college experience but had not received a degree, 22 (7.9%) had an associates degree, and 18 (6.4%) had a bachelors or graduate degree.

Prior to analyses, sample was split into a "low-risk" externalizing group, and a "high risk" externalizing group by calculating a median split of total externalizing behaviors at Wave 10. The low-risk group (n=140) had total externalizing behavior scores of 0-7, with the high risk group (n=138) receiving scores of 8-40. The low risk group consisted of 80 females and 60 males, while the high risk group consisted of 71 females and 67 males. However, chi-square test did not reveal a significant relation between gender and high- or low-risk group membership (χ^2=0.91, *p*=.34). Further, the low-risk group was composed of 66 African American and 74 Hispanic/Latin American participants, while the high-risk group contained 67 African American participants and 71 Hispanic/Latin American adolescents. Again, chi-square tests did not reveal any significant relation between race and high- or low-risk group membership (χ^2=.06, *p*=.81). High and low-risk groups also did not differ on whether their caregiver was living with a partner

or not, (χ^2=.12, p=.73), or their initial intervention, booster, or control group condition (χ^2=1.02, p=.60).

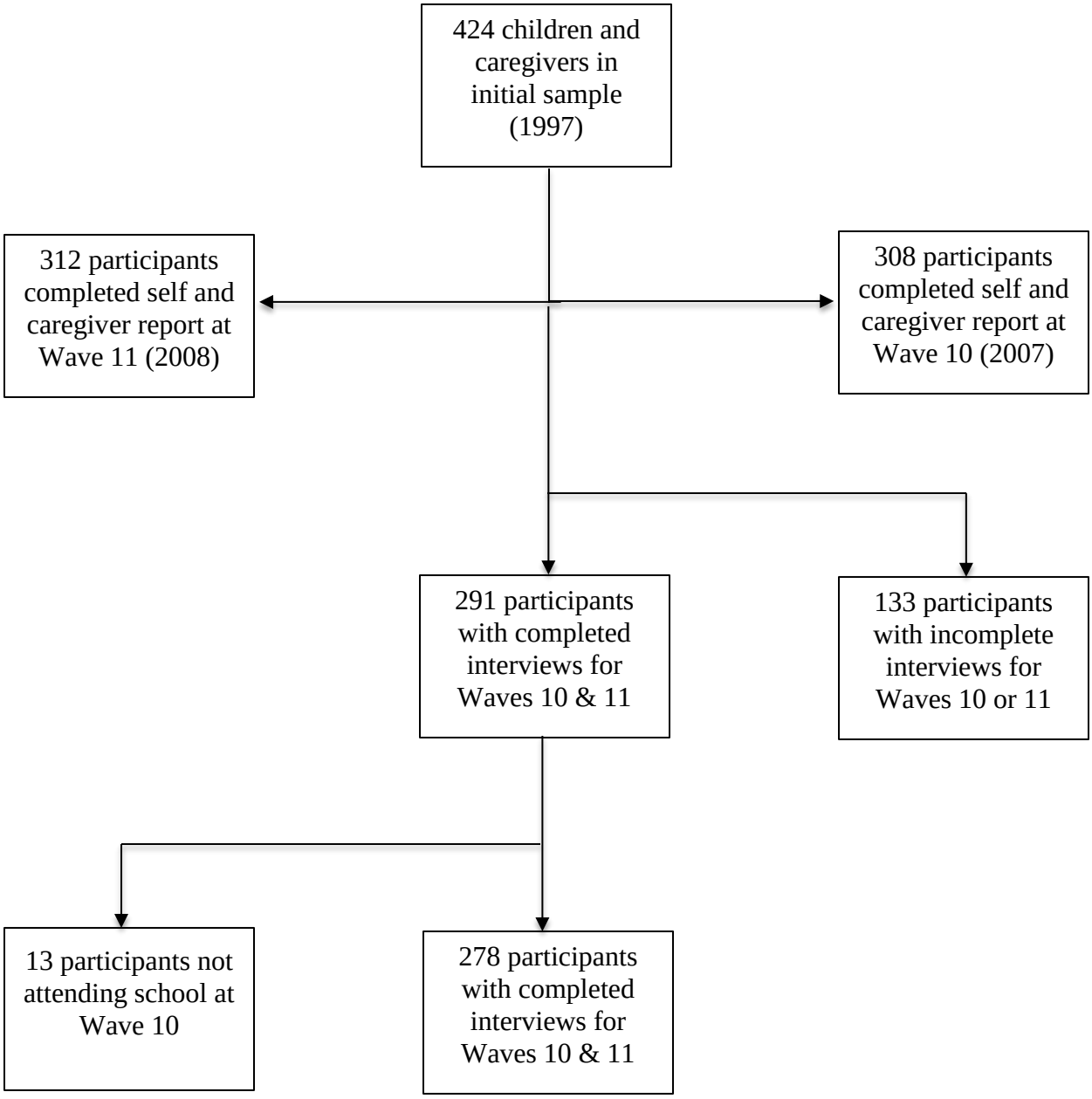

Figure 2. Flow of Participants for Final Dataset

Missing Data Analysis.

From the initial sample, 72.9% of children participated in Wave 10 and 73.6% participated in Wave 11. Additionally, 75% of parents from the initial sample participated in Wave 10 interviews. Very few variables in Waves 10 (1 participant was missing values for Youth Self Report) and Wave 11 (5 participants missing organized activity values) were missing values). Missing data was treated with full information maximum likelihood (FIML) in MPlus, which has been shown to result in unbiased parameter estimates, and is preferable to listwise deletion and multiple imputation in structural equation modeling (Enders & Bandalos, 2001).

Compared to adolescents who did not complete Wave 10, participants did not differ by initial intervention, booster program, or control condition status (χ^2=2.63, *p*=.27), gender (χ^2=2.58, *p*=.11), parental marital status (χ^2=.20, *p*=.66), mother's education (χ^2=4.84, *p*=.30), total family income at Wave 1 (χ^2=4.55, *p*=.34), caregiver age, (*t*(414)=-1.78, *p*=.08), or number of children living in household at Wave 10 (*t*(417)=.52, *p*=.60). Mexican or Hispanic American adolescent participants approached significance of having missing data for Wave 10, χ^2=5.58, *p*=.06. Additionally, participants with missing data were significantly more likely to be slightly older (*m*=6.17, *sd*=.32) at the initial intervention, *t*(422)=2.08, *p*=.04 compared to participants who completed to participants with complete data (*m*=6.10, *sd*=.30) at Wave 10.

Of the caregivers who did not complete Wave 10, participants did not differ by initial intervention, booster program, or control condition status (χ^2=4.02, *p*=.13), child gender (χ^2=2.65, *p*=.10), parental marital status (χ^2=.29, *p*=.59), mother's education (χ^2=4.52, *p*=.34), total family income at Wave 1 (χ^2=1.98, *p*=.74), caregiver age, (*t*(414)=-1.40, *p*=.6), or number

of children in household at Wave 1 ($t(417)=.131$, $p=.80$). Mexican or Hispanic American caregivers were significantly more likely to have missing data for Wave 10, $\chi^2=10.84$, $p=.004$.

Of the adolescents participants who did not complete Wave 11, participants did not differ by initial intervention, booster program, or control condition status ($\chi^2=3.76$, $p=.15$), gender ($\chi^2=.26$, $p=.61$), parental marital status ($\chi^2=.72$, $p=.40$), mother's education ($\chi^2=4.90$, $p=.30$), total family income at Wave 1 ($\chi^2=2.94$, $p=.57$), child age, ($t(422)=1.83$, $p=.07$), mothers age ($t(412)=-1.79$, $p=.08$), or number of children in household at Wave 1 ($t(417)=1.31$, $p=.19$). Mexican or Hispanic American adolescent participants were significantly more likely to have missing data for Wave 11, $\chi^2=6.07$, $p=.05$.

Sample Size & Power.

Utilizing a power analysis calculator, 89 participants would be necessary to detect effects at a 90% probability when there is an effect to be found (Preacher & Coffman, 2006). Sample sizes were determined with a power analysis of my full LISREL model with the parameters freely including autocorrelated measures estimated, $df=259$, $\alpha=.05$, RMSEA <.10 and a desired power level of .90. With the current sample size, I can be sufficiently sure my statistical models are fully identified, and that I have sufficient power to interpret small effects such as factor and measurement invariance across different groups.

Procedure

Beginning in 1997, participants were recruited from 5 elementary schools located in low-income, high-crime neighborhoods in Chicago, IL. During first grade, about half of the children and their primary caregivers (n=232 pairs) were randomly-assigned to receive a 20 week intervention

which included a twice-weekly reading tutoring program for the children. Parents in the treatment group attended a weekly meeting led by licensed therapists and social workers to provide information about child development, improve child-parent relationships, and build social support across parents (Henry, et al., 2012), while remaining families served as controls. Additionally, a little over half of children in the intervention group (n=101) were selected to receive a booster program to receive similar family sessions and a paired reading club across 20 weeks in 4th grade (Tolan, Gorman-Smith, Henry, & Schoeny, 2009). Following the intervention, children and parents were contacted for yearly follow-up interviews across 11 waves of data, until 2008, when children were, on average, 18 years old.

The SAFE children study had low rates of participation in the family sessions (51% of families assigned to the intervention condition did not attend any weekly sessions across the 20 weeks). This low participation rate (as well as significant differences in parent characteristics in who was likely to attend the group at minimal or high levels) was proposed to contribute to the non-significant impacts of the intervention. In general, by the end of first grade, no significant differences emerged between treatment and control groups in regards to bonding, and parent's perception of child's aggression, hyperactivity, and concentration. Children in the intervention group showed greater growth in reading ability in second grade compared to control children, as well as higher parental involvement in school (Tolan, Gorman-Smith, & Henry, 2004). Analyses of the 4th grade booster program demonstrated marginally significant reductions in aggression, significant reductions in children's impulsivity and improvement in their concentration in 5th grade in children who received the booster program compared to children who only received the

initial intervention (Tolan, Gorman-Smith, Henry, & Schoeny, 2009). No significant differences were found between initial intervention group and booster group in regards to academic achievement, school bonding, parental discipline or monitoring, or family cohesion and structure (Tolan et al., 2009).

Participants in the initial intervention when the children were in first grade and control group children did not differ in any of my variables of interest (*p*'s all >.10). Further, in my own analyses, no significant differences were found between treatment, control, or booster groups in aggressive behaviors ($F(2, 275)=.54$, $p=.58$), delinquency ($F(2, 275)=.08$, $p=.93$), substance use ($F(2,275)=.05$, $p=.96$), impulsivity ($F(2, 275)=2.71$, $p=.07$), dimensions of organized activity participation (*p*'s all >.05) or any levels of parental monitoring (*p*'s all >.39). Due to the trending significance of impulsivity between groups, post-hoc tests were run. Significant differences were found between the booster and treatment group ($p=.02$), with the treatment group being rated by caregivers as more impulsive on average ($m=2.59$, $sd=2.82$), compared to the booster group ($m=1.71$, $sd=1.89$). Because differences were not found between the control group and either the treatment or booster condition (implying no impact of the initial or booster intervention in increasing organized activity participation, parental monitoring, or in decreasing impulsivity or externalizing behaviors), in further analysis control, intervention, and booster groups are analyzed together.

Measures

Youth Self-Report Measures.

Substance use. 3 items at Wave 11 evaluated on how many occasions alcoholic beverages, tobacco products, or marijuana, were consumed since the last interview. Items were taken from the Monitoring the Future survey (Johnston et al., 2016). Items included; "During the last 12 months, how many times have you smoked cigarettes (used tobacco)?; During the last 12 months, on how many occasions (if any) have you had alcohol to drink?; and During the last 12 months, on how many occasions (if any) have you used marijuana/hashish?" Participants responded on a 6-point Likert-like scale from 0 (never/0 occasions) to 6 (40 or more occasions). Substance use scores were than averaged to create one substance use score (M=1.09, SD=1.46).

Externalizing behaviors. Externalizing behaviors were calculated by computing raw scores from Achenbach's Youth Self Report (derived from the Child Behavior Checklist for children between the ages of 12 to 18; Achenbach, 1991). During Wave 10 and 11, youth completed the items with self-report. The Youth Self-Report is a widely used measure that has been shown to be psychologically reliable and valid. The test-retest validity has been shown to be acceptable, r=.65, and show acceptable levels of criterion and content validity among clinical and non-clinical populations (Achenbach, 1991). The aggression and delinquency subscales are each scored on a 3 point Likert-like scale, from 0 (Not true) to 2 (Very often). As previously mentioned, participants externalizing scores (delinquency and aggression) in Wave 10 were summed, and a median split was conducted to divide the sample into a low-risk externalizing group (participants whose total scores were 0-7), and a high-risk externalizing group

(participants whose total scores were 8-40). On average, participants had total externalizing scores of 8.85 (*SD*=7.06) at Wave 10.

Externalizing behaviors is composed of two subscales, youth's aggression and delinquency scales. Delinquency scores were calculated from a total of 12 items including "I steal from home" and "I cut class or skip school". Youth report of delinquent behaviors met acceptable levels of internal reliability in Waves 11 (α=.74). On average, in Wave 11 had average delinquent scores of 3.08 (*SD*= 2.82, range, 0-20). Aggressive behaviors were calculated with 18 items including, "I get in many fights" and "I have a hot temper". Youth report of aggressive behaviors met acceptable levels of internal reliability in Waves 11 (α=.85). On average, youth in Wave 11 had aggression scores of 4.83 (*SD*=4.70, range 0-25).

As with substance use, the validity self-report method of externalizing behaviors has been questioned (Reiss, 1975; Huizinga & Elliot, 1986), as opposed to parental report or court documents. However, self-report has been found to match national and representative reports of substance use and delinquency (Brown, Clasen, & Eicher, 1986; Osgood et al., 1989) as well as statistical models that show convergent and discriminant validity for self-reported domains of delinquency and substance use (Farrell et al., 2000; Fletcher, Steinberg, & Williams-Wheeler, 2004).

Parental monitoring. Parental monitoring refers to active strategies parents use to track their child's whereabouts, activities, and friendships and the dynamic processes by which youth respond to parental monitoring (Brown & Bakken, 2011). During Wave 10, 8 items from the Parenting Practices Questionnaire (Gorman-Smith et al., 1996) were utilized to capture multiple

dimensions of parental monitoring set forth by Kerr and Stattin (2000a, b)— parental knowledge, adolescent disclosure, parent solicitation and parental control. Adolescents were instructed to think back across the past month, and report in a typical week how much they endorse or act in the following items.

Parental knowledge. 2 items including, "It is important for your parent to know what you are doing when you are out" and “How often do you talk with your parent about what you had actually done during the day".

Adolescent disclosure. 2 items including "How often you talk to your parent about your friends", and "How often did you go to your parent and talk about a problem you had".

Parent solicitation. 2 items that assesses, "How often do your parents talk to the parents of one of your friends; and "How many of your friends do your parents know well".

Parental control. 2 items including "Parents make clear rules about curfew" and " Parents make clear rules about substance use". All items were scaled on a 6 point Likert-scale from 1 (Never/None/Not at all Important) to 6 (Always/All/Very Important). Parent report of monitoring met acceptable levels of internal reliability (α=. 71).

Dimensions of organized activity involvement. Organized activity involvement during the school year and summer was assessed with 7 items from the Prosocial Involvement Scale (Tolan et al. 1997). Youth responded how often they participated in 6 different activities during the school year- school athletic teams; other school activities like clubs, band or choir, ROTC, or student government; community athletic teams (not including pick-up or sandlot games); community programs like Scouts, service clubs, or hobby clubs; activities at youth centers such

as YMCA or boys and girls clubs, and any tutoring programs outside of school (including receiving tutoring or volunteering as a tutor). Participants responded on a 4 point scale from 0 (never) to 3 (most of the time). One additional question assessed whether participants attended a summer program in the past year (scored with a Yes/No response). From these responses 3 different dimensions of organized activity can be assessed as follows:

Organized activity intensity. Organized activity intensity was calculated by averaging participant responses for each individual organized activity category (sports, school clubs, community-based organization, and tutoring) across Waves 10 and 11. On average, participants had the highest average intensity for school club participation (*M*=1.42, *SD*=1.00), followed by sports with an average intensity score of 1.02 (*SD*=.78). Community-based programs and tutoring were participated in with less frequency, with an average of .55 (*SD*=.63), and .52 (*SD*=.69), respectively.

Organized activity breadth. Breadth categories were calculated into 4 types following the same categorization as intensity: any type of sports involvement, school clubs (not including sports), community-based organized activities, and tutoring programs. Similar categories have used in previous studies of organized activity participation (Fredricks & Eccles, 2006a,b). Participant received a "1" if they indicated they participated in one of these categories in either Wave 10 or Wave 11, and would receive a "0" if they did not participate. Therefore, organized activity breadth scores had a range of 0 (participating in no activities) to 4 (participating in all 4 activity types). 4.7% (n=13) of participants did not participate in any type of activity, 12.9% (n=36) of participants attended only 1 category of activity, 21.1% (n=59) of participants reported

involvement in 2 categories of activity, 30.5% (n=85) of participants reported involvement in 3 categories of activity, and 30.8% (n=86) of participants reported involvement in all 4 categories of activity. Included in the organized activity breadth dimension was a sum of whether youth participated in summertime activities in Wave 10 and Wave 11 (from "0"=no participation in any summer activity to "2"= participation in summer activities in Wave 10 and Wave 11). 177 (63.7%) participants reported no summertime organized activities, 69 (24.8%) reported at least 1 summertime organized activity, and 32 (11.5%) reported 2 summers of organized activity participation.

Organized activity duration. Duration scores were calculated using the steps of Fredricks and Eccles (2006a). Mutually exclusive categories were created by participants were coded into 1 of 3 categories: 0= *no participation in organized activity across 2 waves*, 1= *participation in organized activity for 1 year only*, 2=*organized activity participation reported across 2 years*. Due to the linear dependency between organized activity intensity and duration, in Model 4, duration scores were multiplied by corresponding frequency score to determine consistency and intensity of activity participation.

Parent-Report Measures.

Impulsivity of child. Impulsivity scores were calculated from 7 items taken from the Hyperactivity/Impulsivity scale from Achenbach's Child Behavior Checklist (Achenbach, 1991). Parents responded to questions such as "My child acts without stopping to think" or "Fails to finish things they start" scored on a 3-point Likert-like scale, from 0 (Not true) to 2 (Very often). The hyperactivity/impulsivity scale was derived from the Attention Problems subscale of the

YSR as an indicator of Attention Deficit/Hyperactivity Disorder from the Diagnostic and Statistical Manual of Mental Disorders-IV (Achenbach, Dumenci, & Rescorla, 2003). The scale has been shown to have shown acceptable levels of internal consistency (α=.76), test-rest reliability (*r*=.79), and moderate but significant inter-rater agreement for youth and parent report (*r*=.45).

CHAPTER SEVEN

RESULTS

Univariate and Bivariate Calculations

Table 1 displays univariate statistics in the complete sample, and for the low-risk and high-risk groups.

Table 1. Descriptive Statistics for Full Sample and Low- and High Risk Externalizing Groups

	Overall Sample (n=278) *M* (*SD*)	Low-Risk Group (n=140) *M* (*SD*)	High-Risk Group (n=138) *M* (*SD*)
% Female	54.3%	57.1%	51.4%
% African American	47.8%	47.1%	48.6%
Child Age	16.88 (.44)	16.92(.42)	16.83(.46)
Parent Age	41.81 (5.25)	41.06 (5.24)	42.60(5.18)
Number of Children in Home	2.87(1.35)	2.90(1.36)	2.83(1.33)
Child Impulsivity	2.15(2.34)	1.63(1.86)	2.68(2.66)
Parental Monitoring			
Solicitation	3.41(1.33)	3.66(1.37)	3.17(1.24)
Knowledge	4.76(.1.03)	4.91(.97)	4.57(1.05)
Disclosure	3.87(1.42)	4.10(1.41)	3.65(1.40)
Control	5.00(.95)	5.21(.86)	4.80(.99)
Organized Activity Intensity			
Sports	1.02(.79)	1.07(.79)	.97(.79)
School clubs	1.42(1.00)	1.36(.97)	1.48(1.04)
Community-based	.56(.63)	.58(.65)	.53(.60)
Tutoring	.52(.69)	.58(.73)	.46(.65)

Organized Activity Breadth			
Wave 10 score	2.13(1.22)	2.15(1.19)	2.11(1.25)
Wave 11 score	1.98(1.32)	2.01(1.32)	1.94(1.33)
Organized Activity Duration			
Sports	1.35(.76)	1.37(.77)	1.33(.75)
School clubs	1.30(.78)	.89(.78)	.83(.79)
Community-based	.86(.78)	1.27(.79)	1.33(.78)
Tutoring	.59(.72)	.63(.72)	.56(.73)
Delinquency Score Wave 11	3.08(2.82)	2.04(1.83)	4.12(3.25)
Aggression Score Wave 11	4.83(4.70)	3.17(3.57)	6.67(5.33)
Substance Use Wave 11	1.09(1.46)	1.96(2.77)	4.54(5.23)

Bivariate calculations were run for all continuous variables in the full sample, and in the low-risk and high-risk groups (See Tables 2-5). Because child age, and whether parent was married or living with someone, were not significantly associated with any externalizing behaviors, they were dropped from all further analyses. Child gender, race, parental education, and parental age were all included as covariates in full SEM models due to their significant correlation with at least one externalizing or substance use behavior.

Table 2. Bivariate Correlations for Full Sample (n=278)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1. Age	1																					
2. P. Age	.02	1																				
3. # children	.10	-.24**	1																			
4. # adults	.09	.17**	.13*	1																		
5 P. Ed.	-.14*	-.13*	-.05	-.25**	1																	
6. Know	.0	-.08	-.08	.02	.08	1																
7. Disclose	.11	-.16**	-00	-.02	.07	.49**	1															
8. Solicit	-.05	-.10	-.02	-.08	.07	.34**	.48**	1														
9. Control	.06	-.11	-.06	-.05	-.01	.39**	.35**	.18**	1													
10. Impulsive	.01	.03	.10	.04	.03	-.12*	-.01	-.16**	-.18**	1												
11. SportIN	-.11	-.02	-.01	.04	.12*	.12*	.00	.09	.06	-.01	1											
12. SchIN	-.13*	.07	-.02	-.03	.07	.07	.10	.08	.08	-.10	.29**	1										
13. CboIN	.07	-.05	-.02	.01	.02	.04	.17**	.09	.05	-.11	.40**	.21**	1									
14. TutIN	-.03	.03	-.03	-.04	.02	.05	.07	.05	-.01	-.09	.22**	.28**	.35**	1								
15. W10OAbr	-.02	.06	-.03	-.01	.10	.14*	.14*	.13*	-.02	-.11	.49**	.53**	.54**	.55**	1							
16. W11OAbr	-.10	.02	-.07	.05	-.01	.04	.07	.07	.07	-.12*	.57**	.51**	.58**	.50**	.43**	1						
17. Spdr	-.15*	.01	-.05	.03	.12*	.09	.01	.12	.01	-.07	.81**	.32**	.32**	.23**	.55**	.63**	1					
18. Cbodr	.08	-.02	.00	.02	-.03	.06	.17**	.11	.04	-.09	.39**	.21**	.88**	.36**	.60**	.63**	.34**	1				
19. Schdr	-.07	.09	-.08	.01	.01	.08	.06	.04	.07	-.13*	.32**	.90**	.28**	.26**	.58**	.61**	.37**	.30**	1			
20. Tutdr	-.06	.06	-.04	.01	.05	.08	.11	.07	-.03	-.10	.25**	.29**	.37**	.93**	.61**	.55**	.26**	.40**	.29**	1		
21. W11.Deli	.01	.01	.03	-.03	.00	-.22**	-.21**	-.17**	-.28**	.24**	-.12*	-.03	-.11	-.09	-.09	-.06	-.10	-.08	.01	-.08	1	
22. W11.Agg	-.06	.02	.03	-.10	.05	-.21**	-.15*	-.06	-.22**	.27**	.04	.09	-.06	-.02	.03	.06	.04	.00	.11	.00	.67**	1
23. W11.SU	.06	.06	-.11	.09	-.08	-.16**	-.17**	-.19**	-.16**	.09	-.12*	-.06	-.03	-.14*	-.06	-.03	-.06	.00	.02	-.12*	.44**	.18**

Note: * indicates correlations significant a $p<.05$ level, ** indicates significance at $p<.001$ level

Table 3. Bivariate Correlations for Low-Risk Group (n=140)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1.Age	1																					
2. P. Age	.10	1																				
3. # Children	.16	-.19*	1																			
4. # Adults	.20*	.37**	.12	1																		
5. P.Ed.	-.21*	-.28**	-.05	-.26**	1																	
6. Know	-.04	-.01	-.17*	-.05	.21*	1	.															
7. Disclose	.16	-.15	.02	.02	.08	.45**	1															
8. Solic	-.21*	-.12	-.03	-.05	.18*	.32**	.43**	1														
9. Control	-.01	-.02	-.19*	-.06	.01	.42**	.30**	.18*	1													
10. Impulsive	.08	-.01	.20*	.01	.02	-.07	.06	-.05	-.10	1												
11.SportIN	-.05	-.04	.02	.05	.09	.12	-00	.17*	.04	-.05	1											
12.SchIN	-.09	.063	.05	-.06	.029	.16	.08	.08	.05	-.01	.29**	1										
13.CboIN	.110	.002	-.01	.01	-.09	.00	.22**	.07	.07	-.08	.38**	.20*	1									
14.TutIN	-.03	.058	.00	.05	-.04	.10	.06	.03	-.01	.02	.29**	.28**	.39**	1								
15.W10.Oabr	.03	.114	-.01	.07	.04	.17*	.14	.12	-.02	.02	.48**	.49**	.55**	.60**	1							
16. W11.OAbr	-.11	.043	-.02	.03	-.08	.05	.10	.14	.05	-.15	.60**	.52**	.56**	.48**	.45**	1						
17.Spdr	-.15	.002	-.03	.03	.05	.13	-.04	.22**	.01	-.13	.82**	.32**	.31**	.23**	.52**	.67**	1					
18.Cbodr	.13	.068	.01	.06	-.14	-.04	.23**	.11	.02	-.04	.33**	.17*	.87**	.38**	.63**	.59**	.32**	1				
19.Scdr	-.07	.101	-.03	-.01	.02	.13	.08	.05	.05	-.04	.31**	.90**	.24**	.25**	.56**	.62**	.39**	.26**	1			
20.Tutdr	-.05	.080	.01	.09	-.01	.13	.11	.04	-.02	-.02	.30**	.26**	.39**	.94**	.63**	.53**	.25**	.41**	.27**	1		
21. W11.Deli	.10	-.15	-.03	-.12	-.01	-.08	-.05	-.04	-.06	-.01	-.16	.05	-.14	-.11	-.13	-.09	-.15	-.16	.08	-.14	1	
22.W11.Agg	.018	-.13	.10	-.21*	-.01	-.11	.04	.07	-.05	.23**	.05	.17*	-.09	.06	.01	.08	-.01	-.06	.19*	.03	.55**	1
23.W11.SU	.09	-.18*	-.06	-.04	-.09	-.08	-.18*	-.07	-.06	-.10	-.02	-.09	-.02	-.21*	.00	-.09	.00	.05	.03	-.24*,	.32**	.16

Note: * indicates correlations significant at $p<.05$ level, ** indicates significance as $p<.001$ level

Table 4. Bivariate Correlations for High-Risk Group (n=138)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1. Age																						
2. Parent- age	-.02																					
3. # Children	.04	-.29**	1																			
4. # Adult	-.01	-.05	.15	1																		
5. P.Ed	-.04	-.03	-.04	-.26**	1																	
6. Know	.07	-.09	-.02	.11	.03	1																
7. Disclose	.02	-.14	-.03	-.05	.11	.51**	1															
8. Solicit	.09	-.02	-.03	-.11	.02	.31**	.50**	1														
9. Control	.08	-.14	.05	-.02	.03	.31**	.36**	.11	1													
10. Impulsive	.01	.01	.05	.05	-.02	-.09	.00	-.18*	-.17*	1												
11. SportIN	-.19*	.02	-.03	.03	.18*	.10	-.02	-.03	.06	.04	1											
12. SchIN	-.15	.06	-.08	-.01	.09	.03	.13	.10	.13	-.20*	.30**	1										
13. CboIN	.02	-.10	-.03	.02	.15	.07	.11	.09	.01	-.13	.42**	.24**	1									
14. TutIN	-.06	.03	-.07	-.12	.11	-.03	.05	.05	-.04	-.15	.13	.31**	.30**	1								
15 W10OAbr	-.07	.02	-.04	-.08	.16	.12	.14	.14	-.03	-.20*	.51**	.56**	.53**	.51**	1							
16 W11OAbr	-.09	.00	-.13	.07	.08	.03	.03	-.01	.08	-.09	.54**	.50**	.60**	.52**	.40**	1						
17. Spdr	-.15	.02	-.07	.04	.20*	.05	.06	-.01	.01	-.02	.80**	.32**	.34**	.23**	.58**	.58**	1					
18. Cbodr	.02	-.10	-.01	-.02	.09	.14	.10	.10	.04	-.12	.45**	.26**	.90**	.33**	.57**	.67**	.36**	1				
19. Schdr	-.07	.07	-.13	.03	-.01	.04	.04	.05	.10	-.22**	.33**	.89**	.32**	.29**	.60**	.59**	.35**	.34**	1			
20. Tutdr	-.08	.05	-.08	-.06	.13	.02	.10	.08	-.06	-.13	.20*	.32**	.35**	.93**	.60**	.56**	.27**	.39**	.32**	1		
21. W11.Deli	.04	.00	.09	-.01	-.09	-.21*	-.24**	-.17	-.31**	.26**	-.09	-.11	-.08	-.04	-.07	-.04	-.07	-.02	-.06	-.04	1	
22. W11.Agg	-.04	.02	.01	-.07	-.00	-.18*	-.21*	-.04	-.22**	.19*	.09	.02	-.02	-.02	.07	.07	.09	.07	.05	.02	.64**	1
23. W11.SU	.11	.13	-.13	.16	-.17*	-.13	-.12	-.21*	-.13	.07	-.16	-.08	-.01	-.07	-.09	.01	-.09	.00	-.01	-.04	.38**	.05

Note: * indicates correlations significant at $p<.05$ level, ** indicates significance as $p<.001$ level

Data Analysis Plan

All analyses were run in MPlus, a statistical software that can run a variety of analyses related to SEM. SEM models utilize covariance matrices to create measurement models of observed (or measured) indicators that are thought to reflect a common latent variable (Muthén & Muthén, 2009). Additionally, SEM models build structural paths between latent variables and observed measures through simultaneous regression equations to examine direct effects of exogenous variables on multiple outcomes.

The two-step process recommended by Anderson and Gerbing (1988) was utilized to test conceptual models. The first step included testing measurement models by running 3 confirmatory factor analyses that allows factor indices (the individual item scores or sums of parental monitoring, impulsivity, and externalizing behaviors) to load onto orthogonal (uncorrelated) latent variables. Because the data fit the 3 factor measurement model well, model re-specifications were run to improve overall fit of the data based on both statistical output and theoretical considerations (Anderson & Gerbing, 1988). The second step of Anderson and Gerbing's recommendation is to then build structural paths between latent variables, including models where all parameter are allowed to be freely estimated, a theoretical model of interest, and the "next most likely constrained and unconstrained models*"* (Anderson & Gerbing, 1988, pp. 418).

Latent variable path models are preferable over linear regression models when operationalizing involvement in youth activities and collecting data with continuous dependent variables (Busseri & Rose-Krasnor, 2010). The benefits associated with SEM including goodness-of-fit statistics, which indicates how well the collected data fits the proposed models,

including measures of absolute fit, (i.e. RMSEA<.08, and SRMR <.08) and measures of relative fit (i.e. CFI>.9; Bolen & Long, 1993; Hu & Bentler, 1999). Due to the non-normality of externalizing behaviors in this sample, robust maximum likelihood (MRL) estimators were used instead of maximum likelihood estimators, which can overestimate standard errors of parameters. When using the MRL estimator, it is necessary to adjust the chi-square value of model fit using the Satorra-Bentler scaling correction.

Models 1- 4 utilize latent composite variable of all indices of organized activity participation. This differs from latent variable path models in several ways. Latent composite variables, rather than assuming to be the underlying conceptual cause of each indicator as typical latent variables are considered to be the product of the indicators (Bollen & Bauldry, 2011; Busseri & Rose-Krasnor, 2010). Each indicator is not assumed to be equal and interchangeable manifestations of the latent variable, therefore recognizing the unique contributions of organized activity types and settings. Importantly, latent composite variables overcome multicollinearity issues of linear regressions and latent variable path models by having the aggregate scores for breadth, duration, and intensity be unobserved composites rather than measured directly.

Finally, Models 1-4 utilize multigroup invariance analysis with full structural equation modeling (SEM) to examine the relation between exogenous (predictors) and endogenous (outcome) variables, and whether estimated factor loadings differ between my high- and low-risk externalizing groups. Mutltigroup analyses involves 4 progressively more restrictive models which are compared to previously tested measurement or structural invariance model (beginning with a baseline model that tests whether it is appropriate to use the same items across groups).

First, a model testing metric invariance between high- and low-risk subsamples. This constrains factor loadings to be equal while allowing intercepts, means, and variances of the latent variables to vary between groups. Next, a model testing scalar invariance is tested, in which factor loadings, observed indicator intercepts, and factor means are held equal. If measurement invariance is achieved by metric and scalar invariance, models of strict invariance were run, where the factor loadings, intercepts, pathway coefficients and residual variances of latent variables are constrained to be equal. Finally, after tests of strict invariance, pathway invariance were tested by constraining pathways between latent variables to be equal across groups. While metric and scalar invariance test that participants across groups interpret questions in a similar way, tests of strict and pathway invariance test for population differences through structural invariance. Meaning, if strict and pathway invariance is not found, it can be concluded that low- and high-risk groups differ significantly in their relations between predictors and externalizing behaviors. Nested models can be compared with both a chi-squared difference test (with a non-significant chi-square result indicating model is not significantly worsened by the addition of the new parameters), and by measures of absolute and relative fit. Because chi-square tests can be overly sensitive with larger sample sizes, while both methods were used to test for model fit, measures of relative and absolute fit were ultimately used to determine whether data match proposed models.

Model 1. Intensity of Organized Activity Participation Predicting Externalizing Behavior

Overall model. Full SEM path models were run following Busseri and Rose-Krasnor's (2010) recommendation. First, an intensity composite latent variable was created from participant's intensity scores in each of the 4 different activity types. In this model, participant's

frequency scores were averaged across Waves 10 and 11 according to one of 4 categories (sports, school, community-organizations, or tutoring) with each path model to the formative factor fixed at one (indicating equal weighting into a composite score of overall organized activity participation). The unconstrained model did not met acceptable levels of model fit, (RMSEA=.06, CFI=.82, SRMR=.06). Model indices indicated model fit could be improved by correlating variances of gender and sports intensity. The new model had improved, but not acceptable levels, of model fit (RMSEA=.05, CFI=.86, SRMR=.06). The errors of child impulsivity and child disclosure were next correlated, which again showed improved but not acceptable model fit (RMSEA=.05, CFI=.88, SRMR=.06). A final model was run with correlated errors of community-based involvement and child disclosure. The model showed acceptable levels of model fit (RMSEA=.05, CFI=.90, SRMR=.06), although the Satorra-Bentler scale chi-square indicating non-improved fit, χ^2=50.44, df=4, p<.001. The final model explained 14.9% of the variance of externalizing behaviors at Wave 11. Overall, organized activity intensity was not a significant predictor of externalizing behavior (λ=-.09, p=.11). Parental monitoring was a significant negative predictor of externalizing behavior, (β=-.26, p=.001), whereas impulsivity levels (λ =.16, p=.01) and gender (meaning males had greater levels of externalizing behavior, λ =.22, p=.05) were positive predictors of externalizing behaviors. Parental monitoring was also significantly negatively associated with levels of impulsivity (λ =-.25, p=001), parental age (λ =-.03, p=.02), and child gender (meaning females reported higher levels of parental monitoring, λ =-.57, p<.001). See Figure 3 for a model showing standardized and unstandardized pathways between factors in the overall sample.

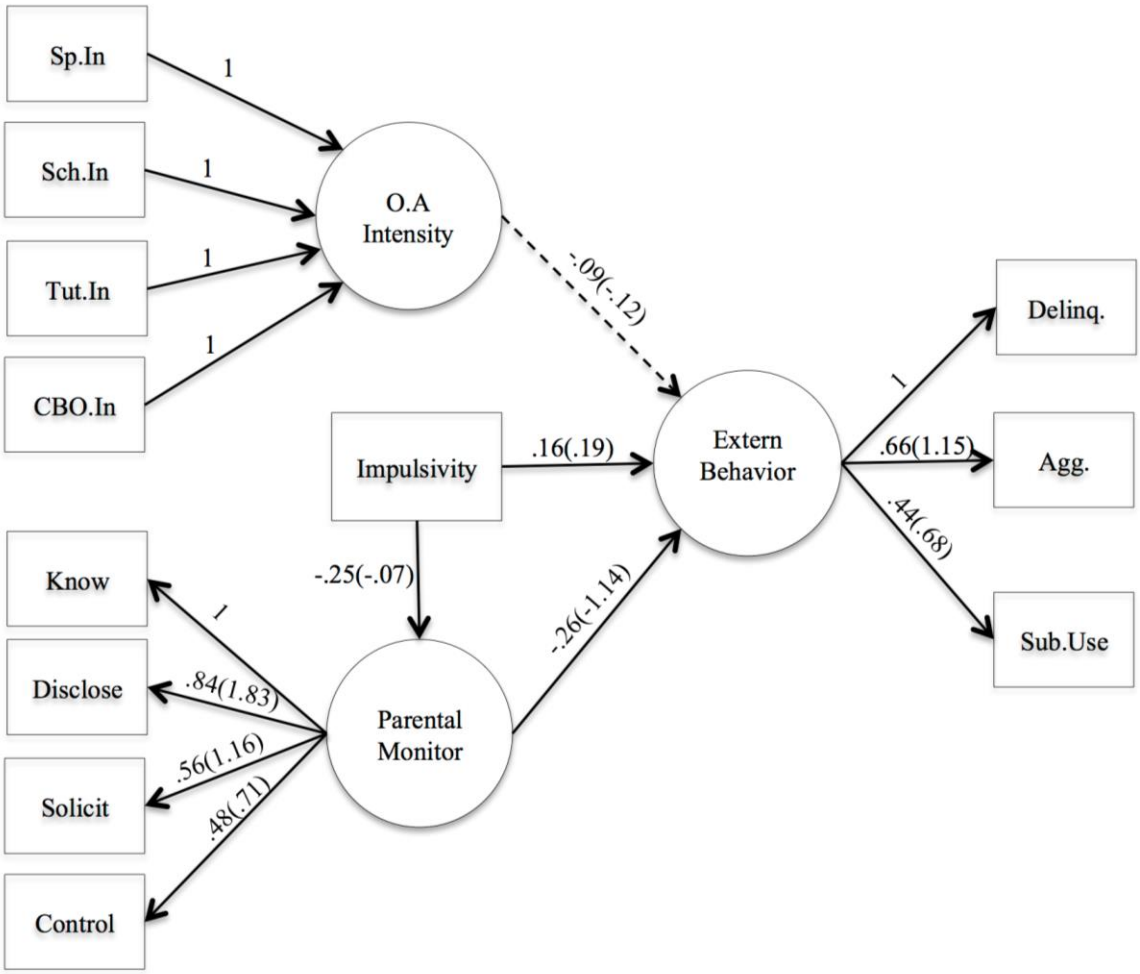

Figure 3. Results of Impulsivity, Parental Monitoring, and Organized Activity Intensity Predicting Adolescent Externalizing Behaviors: Overall Model

Low-risk vs. high-risk group. To determine whether predictors hold different values and variances depending on group-membership (i.e. high versus low risk groups) a multiple group analysis was run. First, a configural model was run to determine whether individual measures are appropriate to use for both groups. The baseline model met acceptable levels of model fit (RMSEA=.05, CFI=.91, SRMR=.06), indicating indicators of the model are appropriate to include for high- and low-risk groups.

Next, a test of metric invariance that constrained factor loadings while allowing all other parameters of the model to vary met acceptable levels of model fit (RMSEA=.05, CFI=.91, SRMR=.06). Additionally, the chi-square difference test showed improved levels of model fit compared to the baseline model, Satorra-Bentler χ^2=8.90, df=4, *p*=.06. This indicates that while models of high and low-risk groups show acceptable levels of fit using the same items, the model was not significantly worsened by forcing factor loadings to be equal across groups. This implies that youth in the high- and low-risk groups assign similar meanings to individual items.

Next, models of scalar invariance were run to determine whether measured indicators and means of latent variables showed variance across groups. This holds factor loadings and intercepts of observed indicators equal across groups. This did not show acceptable levels of model fit (RMSEA=.05, CFI=.88, SRMR=.07). Model indices showed a model where delinquency intercepts were allowed to vary between groups would improve model fit. The new model showed significant model fit, (RMSEA=.04, .CFI=.92, SRMR=.07) and improvement compared to the metric invariant test, Satorra-Bentler χ^2=33.82, df=22, *p*=.05. This indicates that as would be expected, there are significant differences in the factor mean for youth's delinquency behavior between the high- and low-risk groups. Among the high-risk group, the estimated average delinquency score was 4.12 (intercept =3.17), compared to an average of 2.04 (intercept=4.66) among the low-risk group. Because the data were found to fit the model well while still constraining some intercepts and means of observed variables, models can be considered partially invariant, therefore structural invariance can be tested as well.

Finally, models of strict invariance were tested to examine differences in structural pathways and unexplained error in latent variables. A model was run that constrained the

unexplained error for organized activity intensity, parental monitoring, and externalizing behavior between high and low risk groups which met acceptable levels of model fit (RMSEA=.04, CFI=.93, SRMR=.07). Next, individual residual covariances were constrained to be equal across groups. This did not meet acceptable levels of model fit (RMSEA=.07, CFI=.79, SRMR=.12). Model indices indicated model fit would be significantly improved by freeing the residual covariance of substance use, which met nearly acceptable levels of model fit (RMSEA=.05, CFI=.90, SRMR=.09). Next, the residual covariance of aggression was freed, which met acceptable levels of model fit (RMSEA=.04, CFI=.92, SRMR=.08), Satorra-Bentler χ^2=9.79, df=11, p=.55.

By establishing partial measurement invariance, structural pathway invariance between latent variables could be tested. First, a model that constrained all structural pathways to be equal was run. This did not meet acceptable levels of model fit, (RMSEA=.08, CFI=.74, SRMR=.10). Next a model was run that freed the pathways between parental monitoring and externalizing behavior. This had near levels of acceptable model fit (RMSEA=.06, CFI=.83, SRMR=.11). A model was then run that freed the pathways between parental monitoring and organized activity participation, which showed improved model fit (RMSEA=.04, CFI=.92, SRMR=.08), Satorra-Bentler chi-square test, χ^2=152.91, df= 3, p<.01. Across both groups, impulsivity (unstandardized λ =.17, p=.04), and gender (λ =.18, p=.01) were significant predictors of externalizing behavior. Impulsivity (unstandardized λ =-.07, p=.01), parental age (λ =-.10, p=.05), and gender (λ =-.30, p<.01) were also significantly related to parental monitoring across both groups. In the high-risk group parental monitoring (β=-.29, p=.01), remained a significant predictor of externalizing behavior, but was not a significant predictor in the low-risk group (β=-

.90, p=.07). Additionally, in the high-risk group a significant correlation of covariance between organized activity and parental monitoring was found (p=.03), but in the low-risk group, this correlation was not significant (p=.26). Table 5 displays a summary of comparative model results. Figures 4 and 5 display standardized and unstandardized pathways for high-risk and low-risk subsamples respectively.

Table 5. Results of Overall Model Fit of Organized Activity Intensity, Parental Monitoring, and Impulsivity, Predicting Externalizing Behaviors and Measurement Invariance Analyses between High- and Low-Risk Subsamples

Name of Model	Sattora-Bentler χ^2	df	p	RMSEA	SRMR	CFI
Overall Sample Results						
Model 1. Final Full Model	137.94	86	<.001	.05	.06	.90
Model 2. Nested Model (no constraints)	184.50	90	<.001	.06	.06	.82
Multigroup Analysis Results						
Model 3. Configural Invariance (baseline model)	158.71	114	<.001	.05	.06	.91
Model 4. Metric Invariance (factors loadings constrained to be equal)	147.83	118	<.001	.05	.06	.91
Model 5. Scalar Invariance (factor loadings & intercepts constrained to be equal)	173.01	134	.02	.04	.07	.92
Model 6. Strict Invariance (factor loading, intercept, means & residual variances invariance)	181.60	145	.02	.04	.08	.92
Model Comparisons	$\Delta\chi^2$	Δdf	p			
Model 1 vs. Model 2	50.44	4	.001	-	-	-
Model 3 vs. Model 4	8.90	4	.06*	-	-	-
Model 4 vs. Model 5	33.82	22	.05*	-	-	-
Model 5 vs. Model 6	9.79	11	.55*	-	-	-

Note: * indicates significant model fit improvement between models.

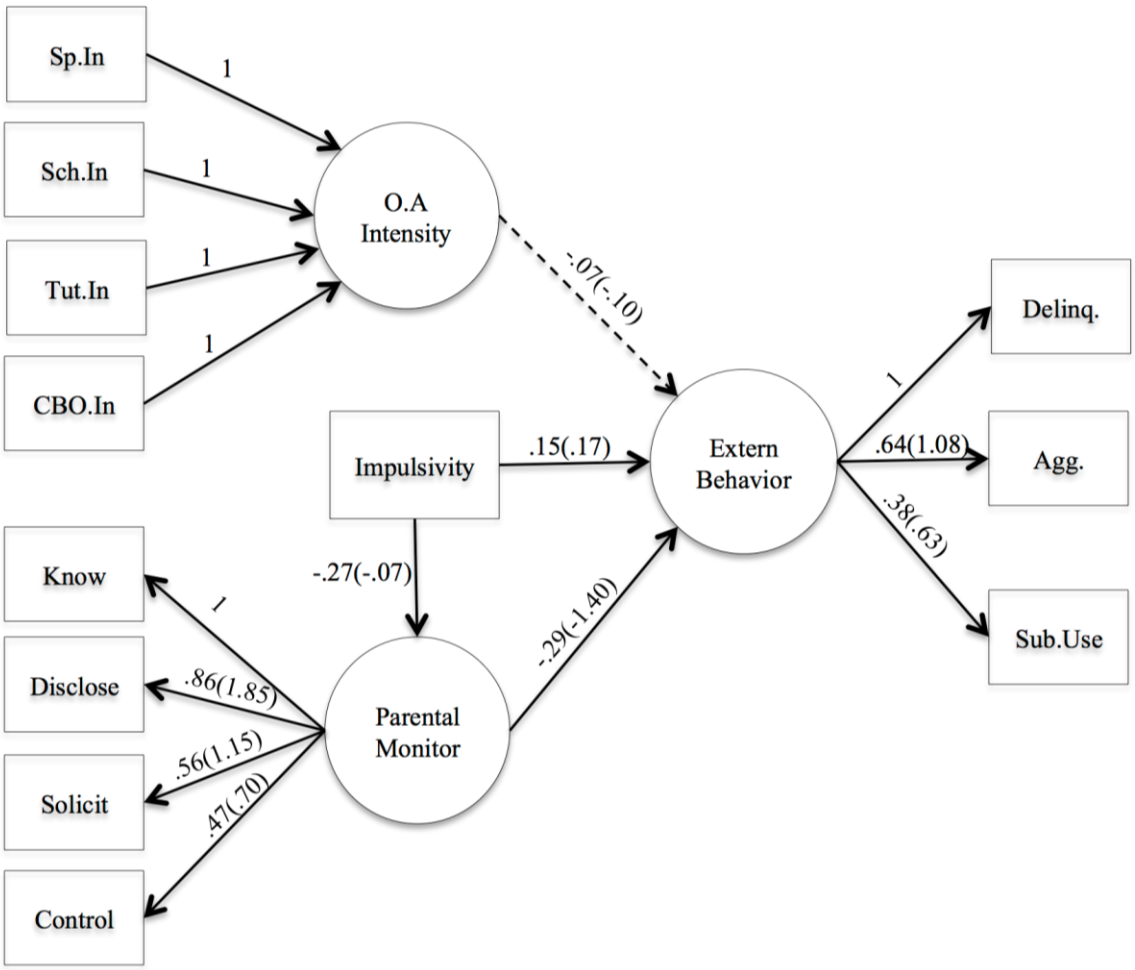

Figure 4. Results of Impulsivity, Parental Monitoring, and Organized Activity Intensity Predicting Adolescent Externalizing Behaviors: High-Risk Subsample

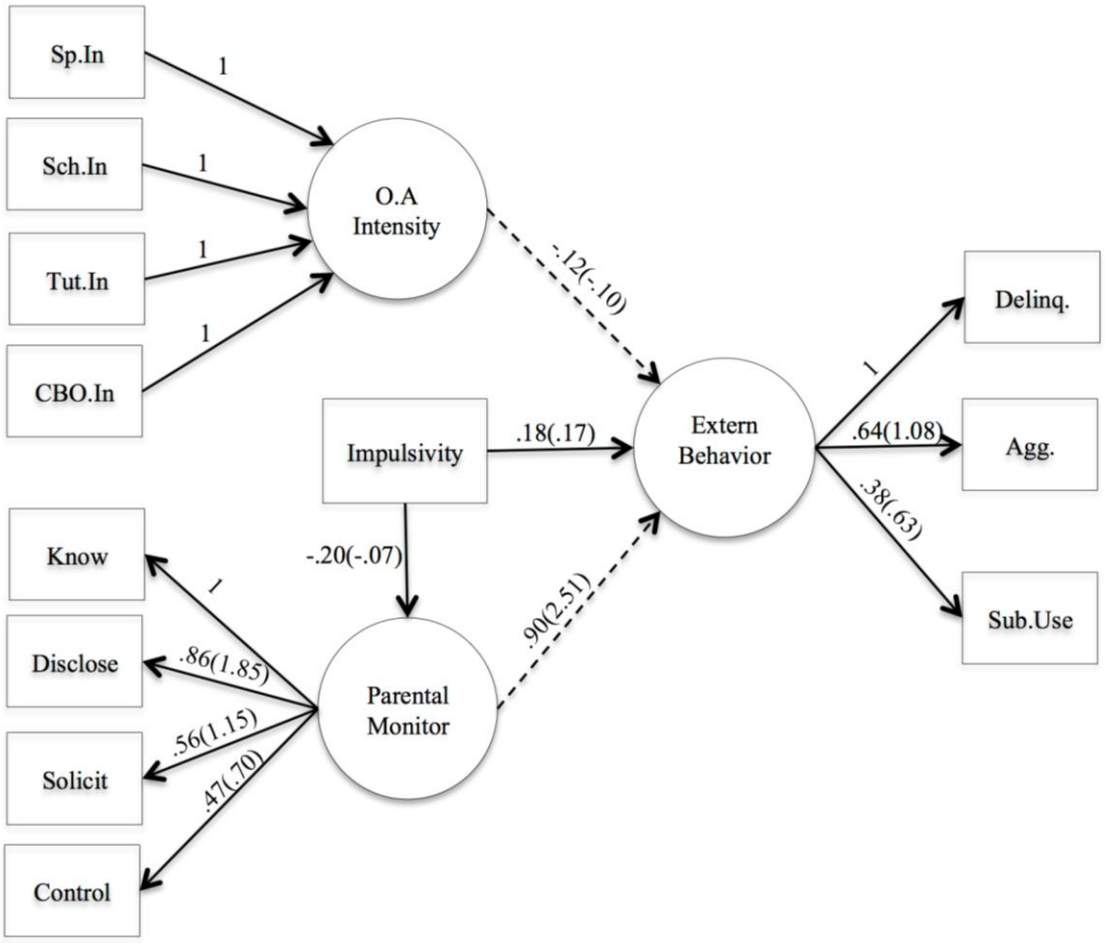

Figure 5. Results of Impulsivity, Parental Monitoring, and Organized Activity Intensity Predicting Adolescent Externalizing Behaviors: Low-Risk Subsample

Model 2. Summer Program and Breadth of Organized Activity Participation Predicting Externalizing Behavior

Overall model. Next, impulsivity, parental monitoring, summertime activity participation, and breadth scores were directly regressed with no model restraints onto externalizing behavior in Wave 11. The unconstrained model did not meet acceptable levels of model fit, (RMSEA=.05, CFI=.89, SRMR=.06). The model was constrained by adding correlated errors of impulsivity and child disclosure. The constrained model showed acceptable levels of

model fit, (RMSEA=.05, CFI=.92, SRMR=.06), Satorra-Bentler χ^2=14.25, df=1, p<.01. As found in the previous model, parental monitoring (β= -.26, p<.01), and impulsivity (λ =.17, p=.01), were significant predictors of externalizing behaviors, while organized activity breadth and summertime participation (λ = -.05, p=.36) were not. 14.3% of the variance of externalizing behavior was found to be predicted by the model. As found in model 1, impulsivity was also significantly negatively related to parental monitoring (λ =-.24, p<.01), as was gender (λ =-.59, p<.01). Figure 6 displays a model showing standardized and unstandardized pathways between factors for the overall sample.

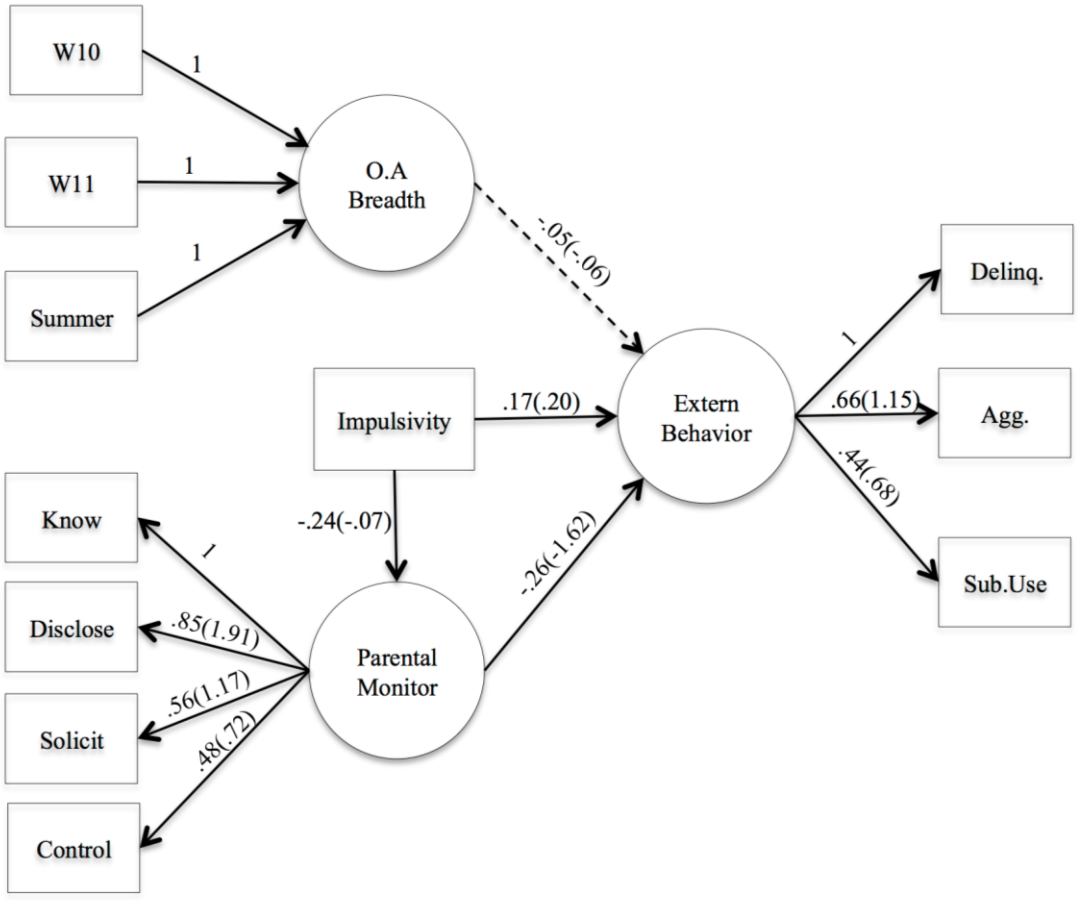

Figure 6. Testing the Model Fit of the Adolescent Externalizing Behaviors and Substance Use from Impulsivity, Parental Monitoring, and Organized Activity Breadth: Overall Model

Low-risk vs. high-risk group. Models of measurement invariance were run to determine whether measurement and structural models showed invariance across groups. First, a configural model was run to determine whether individual measures are appropriate to use for both groups. The baseline model met acceptable levels of model fit (RMSEA=.05, CFI=.92, SRMR=.06). This confirms observed indicators of the model are appropriate to include for high- and low-risk groups.

Next, models of metric invariance were run to determine whether factor loadings showed invariance across groups. This met acceptable levels of model fit (RMSEA=.05, CFI=.93, SRMR=.07), and chi-square difference test showed model fit was not significantly worsened by the new parameters, Satorra-Bentler χ^2=1.36, df=5, p=.93. This indicates factor loadings from latent variables to observed indicators are similar across high- and low-risk groups.

Next, tests of scalar invariance were run. This had near levels of acceptable model fit (RMSEA=.05, CFI=.89, NFI=.07). Model indices showed the model would be improved by allowing the intercept of child delinquency to vary between groups. This showed improved model fit (RMSEA =.04, CFI=.92, SRMR=.07), χ^2=23.73, df=22, p=.36. As in the test of scalar invariance in Model 1, this indicates that the means and intercepts of child delinquency differs between the high-risk group and the low- risk group.

Finally, tests of strict invariance were run to constrain latent variances and observed indicator variances. A model that constrained latent variables variances to be equal failed to meet acceptable levels of model fit (RMSEA=.06, CFI=.85, SRMR=.10). Model indices indicated model fit would be improved by freeing the variance of externalizing behavior between high- and low-risk group, which improved model fit significantly (RMSEA=.04, CFI=.92,

SRMR=.07). Ten, additional constraints were added to make observed indicator covariances equal across groups. This did not meet levels of acceptable model fit (RMSEA=.08, CFI=.74, SRMR=.14). Modification indices showed that the model would be improved by freeing the covariance for substance use, (RMSEA=.06, CFI=.87, SRMR=.10). Finally, model indices indicated aggression covariance should be freed, which showed acceptable levels of model fit (RMSEA=.04, CFI=.93, SRMR=.08), χ^2=1.62, df=1, *p*=.20.

Because partial measurement invariance was reached, models that constrained structural pathways between latent variables were run. The model with all structural pathways constrained had nearly acceptable levels of model fit (RMSEA=.08, CFI=.76, SRMR=.11). Model indices showed that the model would be improved by freeing the pathway between impulsivity and externalizing behavior (RMSEA=.06, CFI=.85, SRMR=.10). Next model indices showed the model would be improved by freeing the pathway between organized activity breadth and externalizing behaviors, RMSEA=.05, CFI=.89, SRMR=.10. Then, a model was run that freed the structural pathway between parental monitoring and externalizing behavior, RMSEA=.04, CFI=.93, SRMR=.08), χ^2=96.23, df=3, *p*<.001. In the high-risk group, parental monitoring (β= -.39, *p*=.001) and impulsivity (λ =.16, *p*=.04) significantly predicted externalizing behaviors, while in the low-risk group, only breadth of organized activities (λ =-.16 *p*=.05) significantly predicted externalizing behaviors. See Table 6 for a summary of comparative model results. Standardized and unstandardized pathways for high-risk and low-risk subsamples are displayed in Figures 7 and 8, respectively.

Table 6. Results of Overall Model Fit of Organized Activity Breadth, Parental Monitoring, and Impulsivity, Predicting Externalizing Behaviors and Measurement Invariance Analyses between High- and Low-Risk Subsamples

Name of Model	Satorra-Bentler χ^2	df	*p*	RMSEA	SRMR	CFI
Overall Sample Results						
Model 1.	106.68	59	<.001	.05	.05	.92
Multigroup Analysis Results						
Model 2. Configural Invariance (baseline model)	135.46	100	.01	.05	.06	.92
Model 3. Metric Invariance (factors loadings constrained to be equal)	135.04	105	.03	.05	.07	.93
Model 4. Scalar Invariance (factor loadings & intercepts constrained to be equal)	158.80	127	.03	.04	.07	.92
Model 5. Strict Invariance (factor loading, intercept, means & residual variances invariance)	160.38	128	.03	.04	.07	.92
Model Comparisons	$\Delta\chi^2$	Δdf	*p*			
Model 2 vs. Model 3	1.36	5	.93*	-	-	-
Model 3 vs. Model 4	23.73	22	.36*	-	-	-
Model 4 vs. Model 5	1.62	1	.20*	-	-	-

Note: * indicates significant model fit improvement between models.

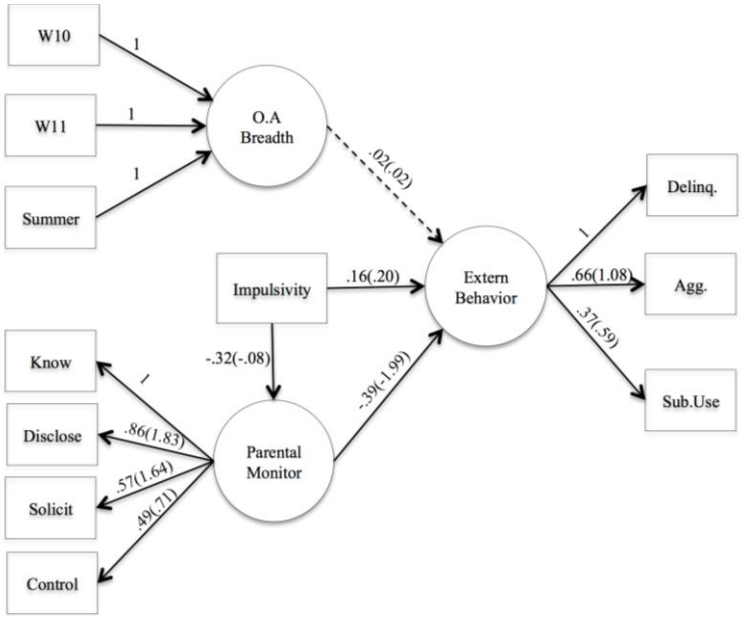

Figure 7. Testing the Model Fit of the Adolescent Externalizing Behaviors and Substance Use from Impulsivity, Parental Monitoring, and Organized Activity Breadth: High-Risk Subsample

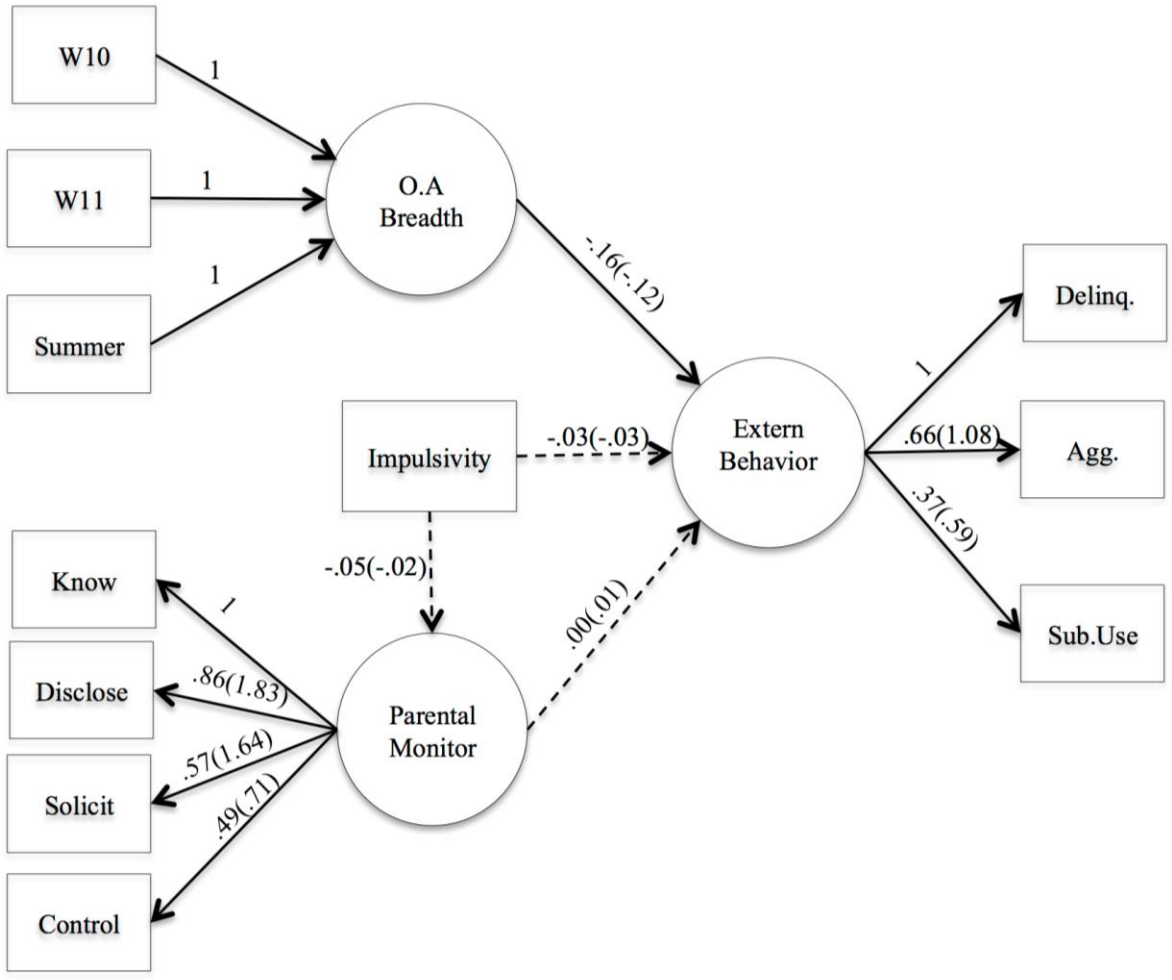

Figure 8. Testing the Model Fit of the Adolescent Externalizing Behaviors and Substance Use from Impulsivity, Parental Monitoring, and Organized Activity Breadth: Low-Risk Subsample.

Model 3. Duration of Organized Activity Participation Predicting Externalizing Behavior

Overall model. An unconstrained model was run with organized activity duration, impulsivity, and parental monitoring predicting externalizing behaviors. The unconstrained model did not meet acceptable levels of model fit, (RMSEA=.05, CFI=.86, SRMR=.06). Next parameter restraints were added to improve model fit. A constrained model was run with correlated errors from impulsivity and child disclosure showed near acceptable model fit

(RMSEA=.05, CFI=.89, SRMR =.06). Next, a model was run that correlated the errors of community-based participation duration and disclosure, and had acceptable levels of model fit (RMSEA=.05, CFI=.91, SRMR=.06), Satorra-Bentler scale chi-square χ^2=46.74, df=22, p<.01. Parental monitoring (β=-.26, p=.01), impulsivity (λ =.16, p=.01) were significant predictors of externalizing behaviors, while duration of participation (λ =-.05, p=.45) was not. 14.2% of the variance of externalizing behaviors was predicted by the model. Additionally, impulsivity was significant related to levels of parental monitoring (λ =.17, p=<.01). See Figure 9 for a model showing standardized and unstandardized pathways between factors for the overall sample.

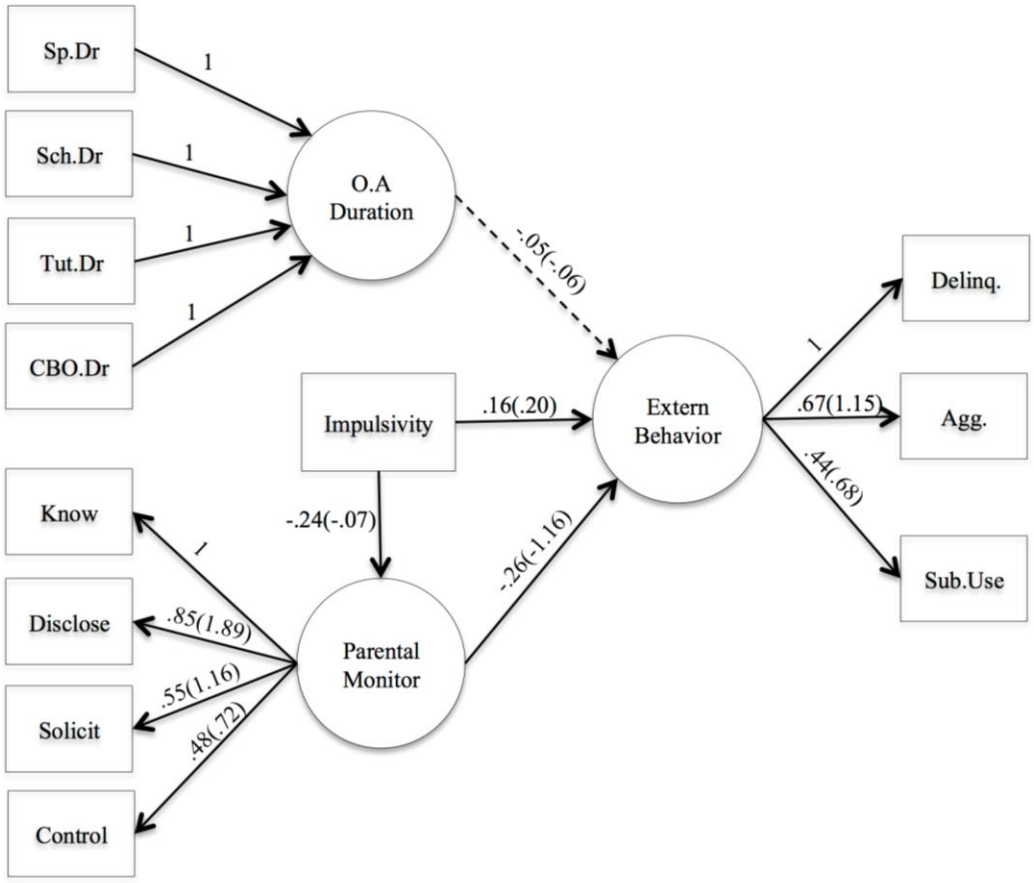

Figure 9. Testing the Model Fit of the Adolescent Externalizing Behaviors and Substance Use from Impulsivity, Parental Monitoring, and Organized Activity Duration: Overall Model

Low-risk vs. high-risk group. A configural model was run to determine whether individual measures are appropriate to use for both groups. The baseline model met acceptable levels of model fit (RMSEA=.06, CFI=.90, SRMR=.06), indicating indicators of the model are appropriate to include for high- and low-risk groups.

First, a model was run testing metric invariance between my high and risk group. A model that constrained parameters met acceptable levels of model fit (RMSEA=.05, CFI=.90, SRMR=.06) and had a non-significant Satorra-Bentler chi-square difference test indicating fit was not significantly worsened by constraining factor loadings, Satorra-Bentler χ^2=1.52, df=5, p=.91.

Next, models of scalar invariance were run to determine whether intercepts and means of latent variables showed invariance across groups. This did not meet acceptable levels of model fit (RMSEA=.06, CFI=.85, SRMR=.07). A model was run that freed the intercept of delinquency. This met near acceptable levels of model fit (RMSEA=.05, CFI=.89, SRMR=.07). Next, a model was run that freed the intercept of child gender. This met acceptable levels of model fit (RMSEA=.04, CFI=.91, SRMR=.06), and had a non-significant Satorra-Bentler scale chi-square indicating improved fit, Satorra-Bentler χ^2=20.15, df=23, p=.63. The average gender in the high-risk is slightly higher than the low-risk group, most likely due to a higher proportion of males in the high-risk group compared to the proportion in the low-risk group.

Models of strict invariance were then tested. A model that constrained variances of latent variables to be equal did meet levels of acceptable model fit (RMSEA=.06, CFI=.83, SRMR=.09). A model was then run that freed the covariance for externalizing behavior, which met acceptable levels of model fit (RMSEA=.08, CFI=.7, SRMR=.12). Next, the covariance of

substance use was allowed to vary across groups, which showed improved model fit (RMSEA=.06, CFI=.84, SRMR=.09). Finally, the variance of child aggression was allowed to vary across groups, which met acceptable levels of model fit (RMSEA=.05, CFI=.90, SRMR=.08), Satorra-Bentler χ^2=.58 df=2, p=.75.

Because partial measurement invariance was achieved, models were then run to compare structural pathways across high- and low-risk groups. A model that constrained all structural pathways to be equal across groups did not meet levels of acceptable fit (RMSEA=.08, CFI-=.72, SRMR=.12). Model indices showed the pathway between parental monitoring and externalizing behavior varied across groups, (RMSEA=.06, CFI=.86, SRMR=.10). Next, model indices indicated improved model fit by allowing the pathway between impulsivity and externalizing behavior to vary (RMSEA=.05, CFI=.91, SRMR=.09). Then a model was run that freed the pathway between organized activity duration and externalizing behavior, which met acceptable levels of model fit (RMSEA=.05, CFI=.90, SRMR=.08), Satorra-Bentler χ^2=5.14, df=5, p=.40. In the high-risk group, parental monitoring (β=-.31, p<.01), impulsivity (λ =.17, p=.05), and parental age (λ =-.08, p=.04) significantly predicted externalizing behaviors, while in the low-risk group, parental monitoring (β=-.06, p=.58) and impulsivity (λ =-.02, p=.79) were not significant predictors. See Table 7 for a summary of comparative model results. Figures 10 and 11 display standardized and unstandardized pathways for high-risk and low-risk subsamples respectively.

Table 7. Results of Overall Model Fit of Organized Activity Duration, Parental Monitoring, and Impulsivity, Predicting Externalizing Behaviors and Measurement Invariance Analyses between High- and Low-Risk Subsamples

Name of Model	Satorra-Bentler χ^2	df	*p*	RMSEA	SRMR	CFI
Overall Sample Results						
Model 1. Final Model (with additional parameters)	116.83	68	<.01	.05	.06	.91
Model 2. Nested Model (no constraints)	163.55	90	<.01	.05	.06	.86
Multigroup Analysis Results						
Model 3. Configural Invariance (baseline model)	159.90	112	<.01	.06	.06	.90
Model 4. Metric Invariance (factors loadings constrained to be equal)	160.01	117	<.01	.05	.06	.92
Model 5. Scalar Invariance (factor loadings & intercepts constrained to be equal)	176.35	135	.01	.05	.06	.91
Model 6. Strict Invariance (factor loading, intercept, means & residual variances invariance)	178.48	133	.01	.05	.08	.90
Model Comparisons	$\Delta\chi^2$	Δdf	*p*			
Model 1 vs. Model 2	14.84	1	<.01	-	-	-
Model 3 vs. Model 4	1.52	5	.91*	-	-	-
Model 4 vs. Model 5	20.15	23	.63*	-	-	-
Model 5 vs. Model 6	4.84	8	.77*	-	-	-

Note: * indicates significant model fit improvement between models.

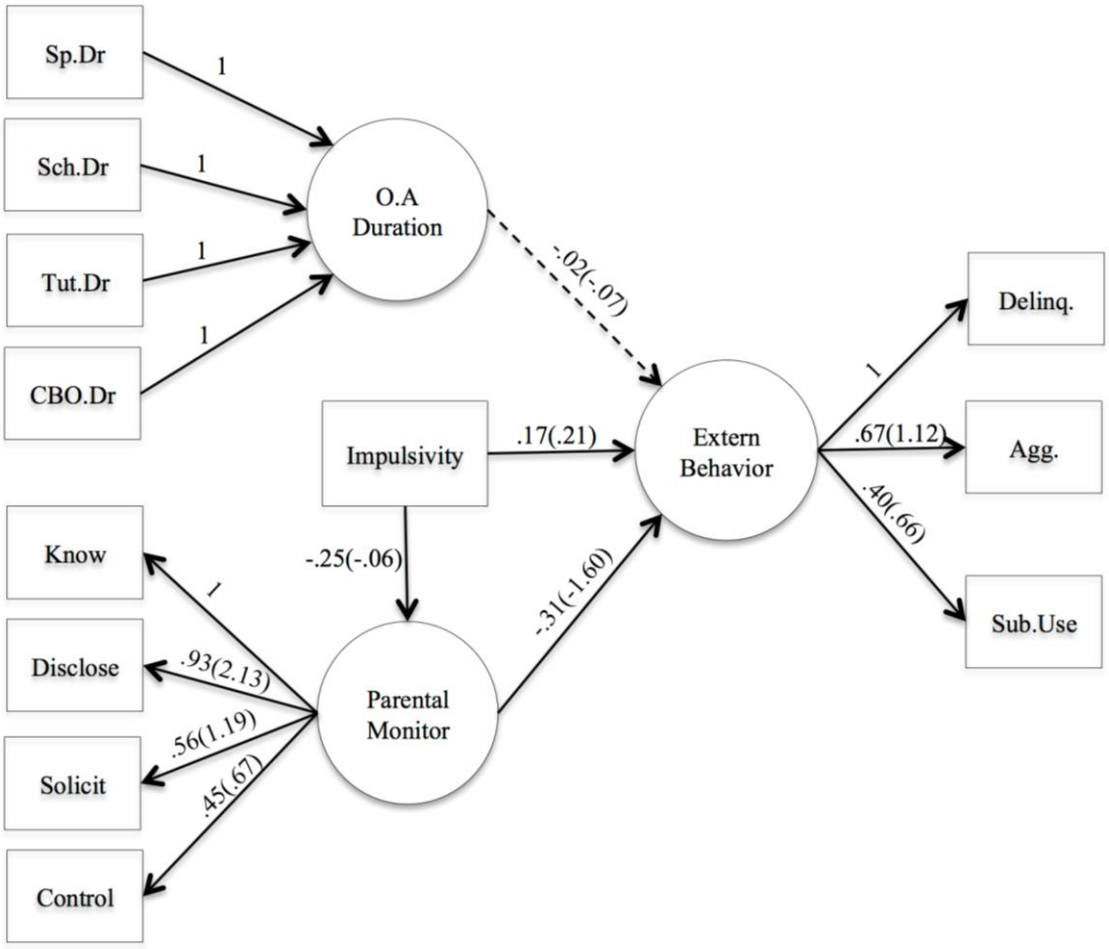

Figure 10. Testing the Model Fit of the Adolescent Externalizing Behaviors and Substance Use from Impulsivity, Parental Monitoring, and Organized Activity Duration: High-Risk Subsample

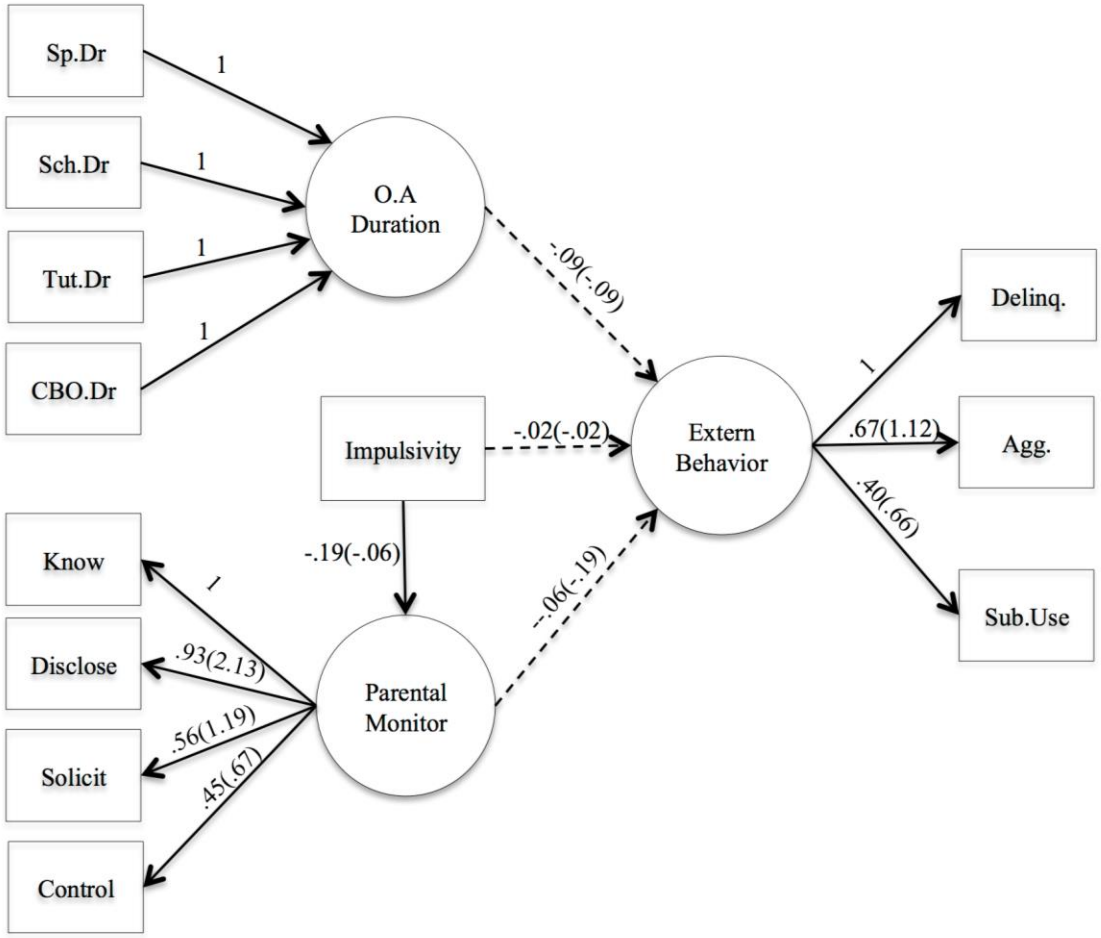

Figure 11. Testing the Model Fit of the Adolescent Externalizing Behaviors and Substance Use from Impulsivity, Parental Monitoring, and Organized Activity Duration: Low-Risk Subsample

Model 4. Multiple Dimensions of Organized Activity Participation Predicting Externalizing Behavior (Combined Latent Construct Model).

Overall model. To examine multiple dimensions of organized activity, a model was run which multiplied each organized activity intensity score with its duration score. Additionally, breadth, and a new dichotomous variable of any participation were run as predictors of externalizing behaviors along with impulsivity, parental monitoring, and covariates. The model did not meet levels of acceptable model fit, (RMSEA=.06, CFI=.83, SRMR=.06). Next, a model was run that correlated the residual error of sports participation and gender. This improved

overall fit, but did not meet acceptable levels of model fit (RMSEA=.05, CFI=.85, SRMR=.06). The model was constrained further by correlating the errors of impulsivity and child disclosure (RMSEA=.05, CFI=.89, SRMR=.06). Finally, a model was run correlating the errors of parental monitoring and gender. This had near acceptable levels of model fit (RMSEA=.05, CFI=.88, SRMR=.05). Next, the errors of sport participation and impulsivity were correlated, which met acceptable levels of model fit (RMSEA=.04, CFI=.92, SRMR=.05), Satorra-Bentler chi-square, χ^2=62.45, df=11, p<.01. Parental monitoring (β=-.28, p<.01), impulsivity (λ =.16, p=.01), and gender (λ =.11, p=.05) were significant predictors of externalizing behavior. Additionally, parental age (λ =-.15, p=.02), impulsivity (λ =-.25, p<.01), and gender (λ =.81, p=.04) were all significantly related to levels of parental monitoring. 16.1% of the variance of externalizing behaviors were able to be predicted from the final model. See Figure 12 for a model showing standardized and unstandardized pathways between factors for the overall sample.

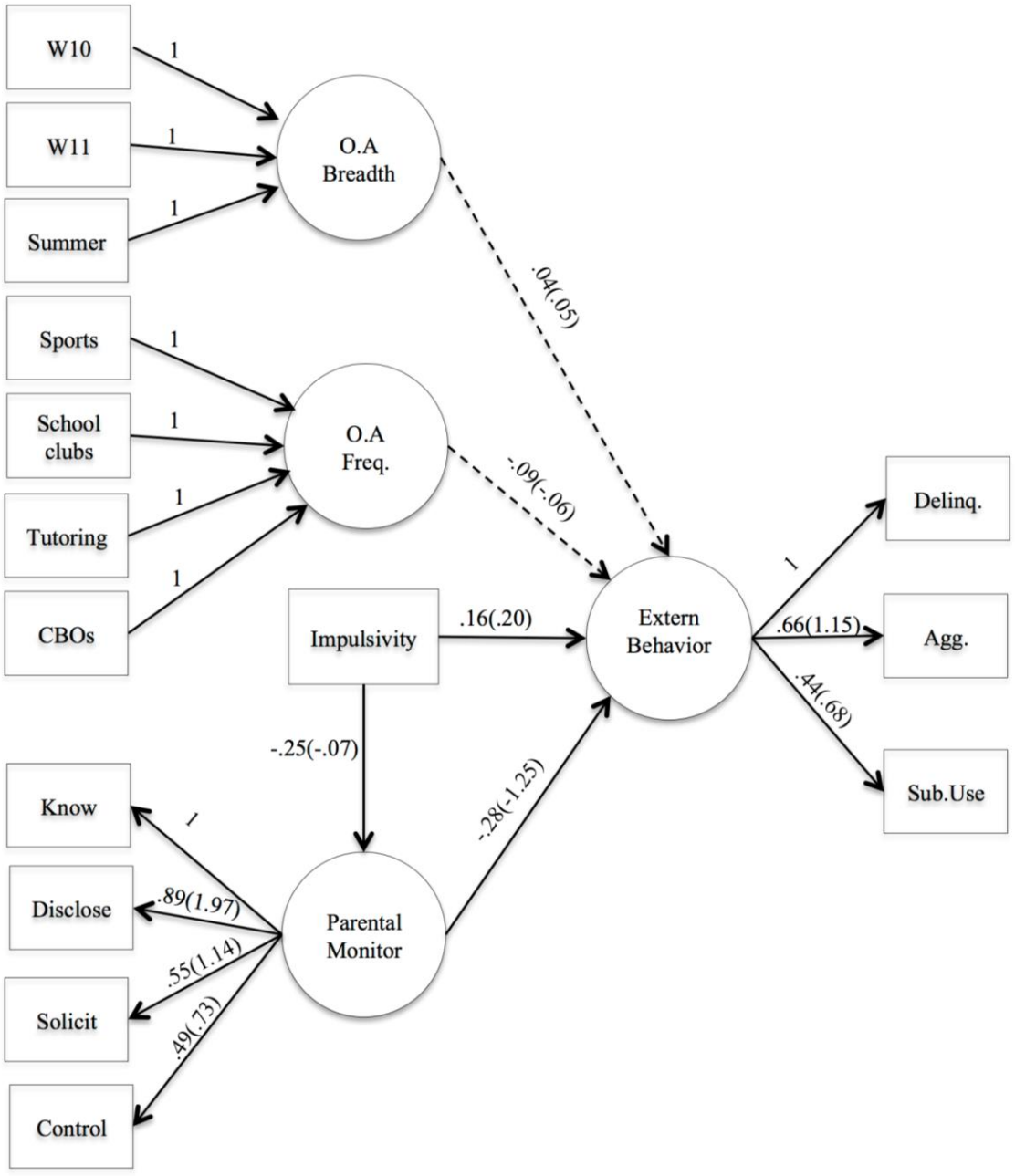

Figure 12. Testing the Model Fit of the Adolescent Externalizing Behaviors and Substance Use with Multiple Dimensions of Organized Activity Participation: Overall Model

Low-risk vs. high-risk group. A configural model was run to determine whether individual measures are appropriate to use for both groups. The baseline model met acceptable

levels of model fit (RMSEA=.05, CFI=.91, SRMR=.06), indicating indicators of the model are appropriate to include for high- and low-risk groups.

Next, models of metric invariance were run to determine whether factor loadings showed invariance across groups. A model that constrained parameters met acceptable levels of model fit (RMSEA=.05, CFI=.90, SRMR=.06), χ^2=9.64, df=6, *p*=.14. This implies that factor loadings are similar across high- and low-risk groups. A model testing scalar invariance was then run, but did not meet acceptable levels of model fit (RMSEA=.05, CFI=.88, SRMR=.06). Model indices showed that model fit could be improved by freeing the intercept of child delinquency between groups. This model met acceptable levels of model fit (RMSEA= .04, CFI=.92, SRMR=.06), χ^2=16.74, df=24, *p*=.86.

Models of strict invariance were then run constraining latent variable and observed indicator variances. A model that constrained latent variables to be equal across groups did not meet acceptable levels of model fit (RMSEA=.05, CFI=.85, SRMR=.08). A model that allowed the variance of externalizing behavior to vary across groups met acceptable level of model fit (RMSEA=.04, CFI=.92, SMR=.06). Next, a model then constrained all of the covariances of observed indicators did not meet acceptable levels of model fit (RMSEA=.07, CFI=.70, SRMR=.11). Model indices indicated model fit would be improved by freeing the covariance for the child disclosure variable. This improved model fit, but not to acceptable levels (RMSEA=.07, CFI=.75, SRMR=.10). Model indices indicated model fit would be improved by also freeing the covariance of substance use across groups (RMSEA=.05, CFI=.85, SRMR=.08). Next, a model was run that freed the covariance of impulsivity between groups (RMSEA =.05, CFI=.88, SRMR=.07). Finally, a model was run that freed the covariance of aggression between groups

which met acceptable levels of model fit (RMSEA=.04, CFI=.90, SRMR=.07), χ^2=1.02, df=6, p=.98.

Because partial measurement invariance was achieved, structural pathways could be compared. A model that constrained all structural pathways to be equal did not meet acceptable levels of model fit (RMSEA=.07, CFI=.74, SRMR=.09). Next, model indices showed the pathway between parental monitoring and externalizing behavior should be free (RMSEA=.05, CFI=.87, SRMR=.08). A model was then run that freed the structural pathway between parental age and parental monitoring (RMSEA=.05, CFI=.89, SRMR=.08). Finally, the pathway between impulsivity and externalizing behavior was allowed to vary across both groups. This model showed acceptable levels of model fit (RMSEA=.04, CFI=.90, SRMR=.08), χ^2=200.62, df=3, p<.01. In the high-risk group, parental monitoring (β=-.42, p=.01), impulsivity (λ =.17, p=.04) and parental age (λ =-.09, p=.02) remained significant predictors of externalizing behaviors. Child impulsivity (β=-.21, p=.02) and parental age (β= -.29, p<.01) also remained significantly associated with levels of parental monitoring. Within the low-risk group, impulsivity (λ =-.21, p=.02), and parental age (λ =-.29, p=.01) remained significantly associated with levels of parental monitoring, but only parental age (λ =-.17, p=.02) remained a significant predictor of externalizing behavior. Table 8 displays a summary of comparative model results. Results for standardized and unstandardized pathways for high-risk and low-risk subsamples are displayed in Figures 13 and 14, respectively.

Table 8. Results of Overall Model Fit of Multiple Dimension of Organized Activity Participation, Parental Monitoring, and Impulsivity, Predicting Externalizing Behaviors and Measurement Invariance Analyses between High- and Low-Risk Subsamples

Name of Model	Satorra-Bentler χ^2	df	*p*	RMSEA	SRMR	CFI
Overall Sample Results						
Model 1. Final Model (with additional parameters)	131.07	88	<.01	.04	.05	.92
Model 2. Nested Model (no constraints)	194.67	99	<.01	.06	.06	.83
Multigroup Analysis Results						
Model 3. Configural Invariance (baseline model)	298.32	155	.01	.05	.06	.91
Model 4. Metric Invariance (factors loadings constrained to be equal)	208.69	161	.01	.05	.06	.90
Model 5. Scalar Invariance (factor loadings & intercepts constrained to be equal)	224.64	185	.02	.04	.06	.92
Model 6. Strict Invariance (factor loading, intercept, means & residual variances invariance)	224.05	179	.01	.04	.07	.90
Model Comparisons	$\Delta\chi^2$	Δdf	*p*			
Model 1 vs. Model 2	62.45	11	<.01	-	-	-
Model 3 vs. Model 4	9.64	6	.14*	-	-	-
Model 4 vs. Model 5	16.74	24	.86*	-	-	-
Model 5 vs. Model 6	1.02	6	.98*	-	-	-

Note: * indicates significant model fit improvement between models.

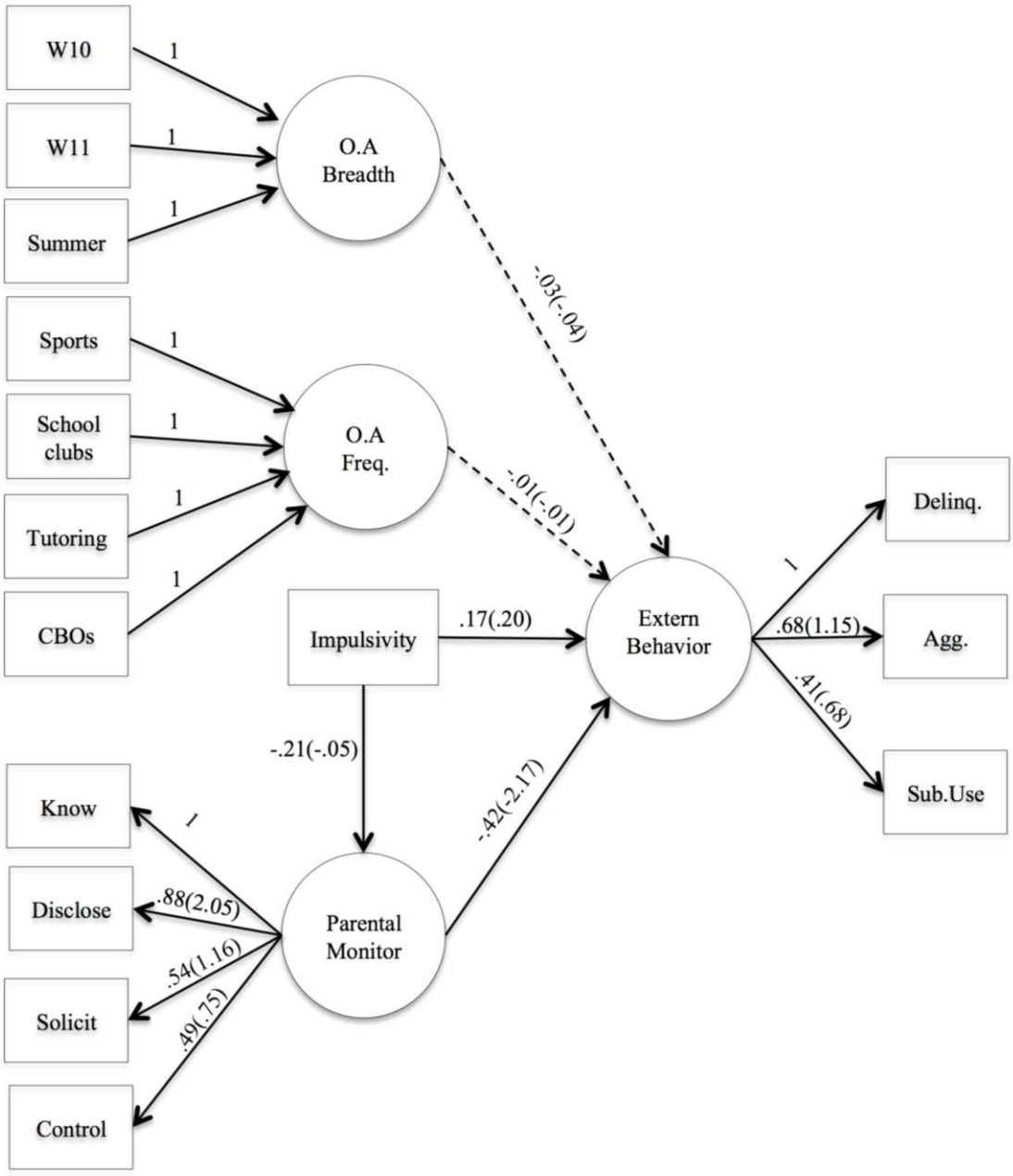

Figure 13. Testing the Model Fit of the Adolescent Externalizing Behaviors and Substance Use with Multiple Dimensions of Organized Activity Participation: High-Risk Subsample

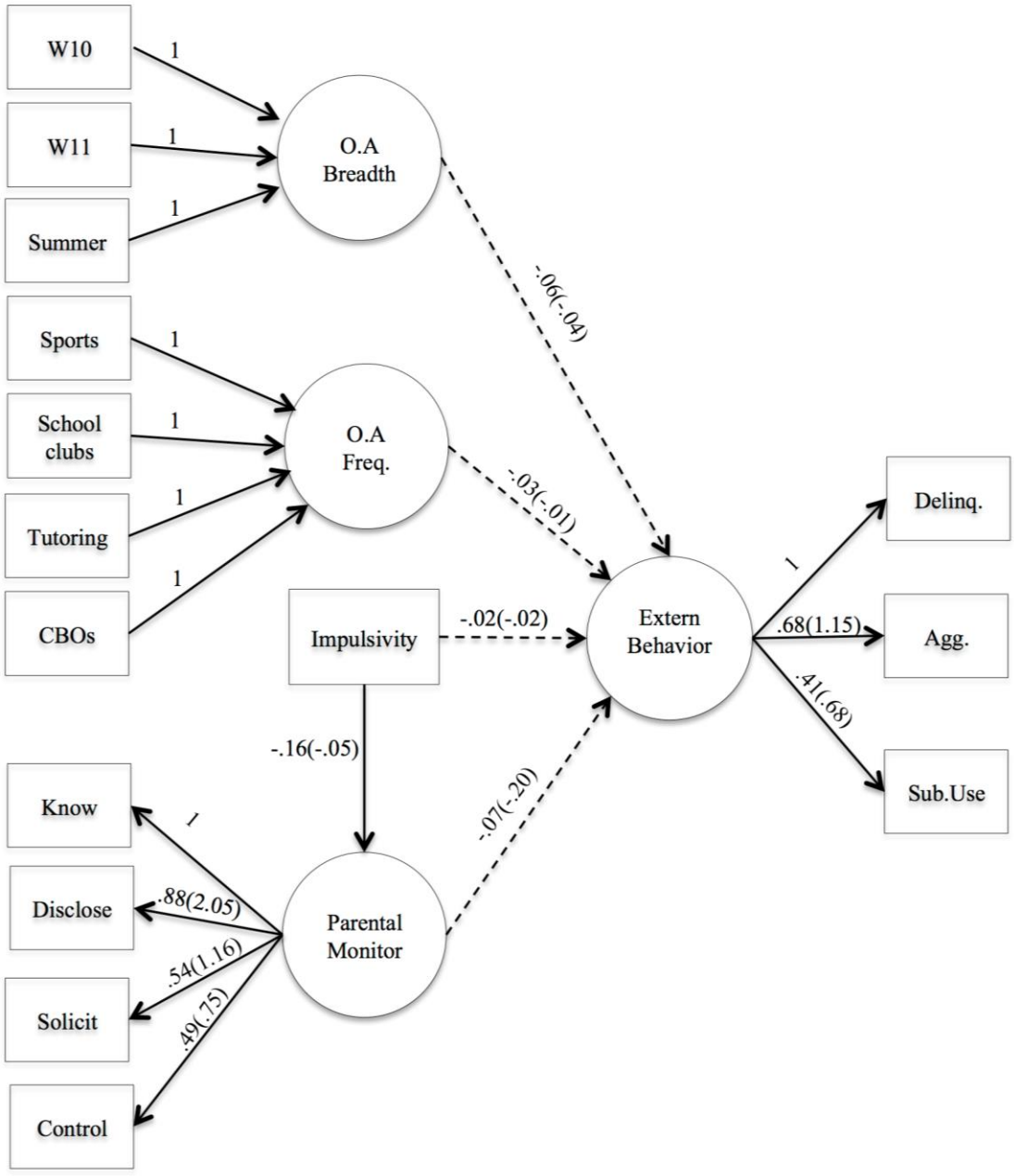

Figure 14. Testing the Model Fit of the Adolescent Externalizing Behaviors and Substance Use with Multiple Dimensions of Organized Activity Participation: Low-Risk Subsample

CHAPTER EIGHT

DISCUSSION

This study assessed how different dimensions of organized activity participation, in addition to parental monitoring and impulsivity, predicted adolescent externalizing behaviors (aggression, delinquency, and substance use) within a sample of low-income, ethnic minority adolescents. This study adds to previous research regarding low-income adolescent's risk behaviors in several ways. First, while past research been able to examine organized activity participation with samples of low-income and ethnic minority adolescents (Gardner, Browning, & Brooks-Gunn, 2012), few studies have utilized latent composite models to simultaneously examine multiple dimensions of organized activity participation among this population. Latent composite models overcome limitations of traditional operationalizations of organized activity involvement. Specifically, latent composite models allow for the simultaneous examinations of multiple dimensions of organized activity participation. This reduces multicollinearity and linear dependency issues of using similar or overlapping items in multiple dimensions of participation, because latent composite variables share unexplained error variance from unmeasured latent variables rather than from observed indicators (Busseri & Rose-Krasnor, 2010). Although this study did not find significant contributions of different dimensions of activity participation in predicting youth externalizing behavior, this approach allowed organized activity intensity, duration, and breadth of participation to be examined simultaneously as contributors to adolescent behavior.

This study took also took the unique approach of examining the sample of 278 youths as a whole group, and by analyzing the measurement and structural invariance of a low- and high-risk subsample. Including measurement and structural invariance models in this study was necessary and informative for several reasons. Prior to utilizing measurement and structural invariance, models were run that predicted later levels of externalizing behaviors (at Wave 11) while controlling for concurrent externalizing levels (at Wave 10), but the relation between concurrent and later externalizing behaviors was extremely high (β=.81), which prevented any other predictor from gaining significance and indicated redundancy between the measures. Rather than dropping concurrent levels of delinquency completely from analysis, a median split was run to create the "high" and "low" risk of externalizing groups. Tests of measurement and structural invariance, therefore, would be able to determine whether proposed indicators similarly reflected factors of organized activity involvement, parental monitoring, and impulsivity, and whether the relation between the factors was similar across groups. Due the partial measurement invariance and significant structural differences between the high- and low-risk samples, it does appear that certain indicators and factors may be more protective or important depending on the adolescent's engagement in externalizing and substance use behaviors.

By examining a high-risk and low-risk subsample, selection effects, which may impact who participates in organized activities, could be partially accounted for. Although overall models predicted later externalizing and substance use behaviors from Wave 10 and Wave 11 activity participation, because participants self-select into organized activities, it is unclear whether participation in organized activities lowers externalizing behaviors, or whether

characteristics of youth who decide to join organized activities are what reduce externalizing and substance use behaviors. Research has shown that when accounting for self-selection factors, the relation between organized activity participation and positive outcomes is significantly reduced or becomes non-significant (Fredricks & Eccles, 2006; Larson, 2000). If participation rates significantly differed between the high- and low-risk subsamples, it may have indicated that individual characteristics of each group impacted to what degree youth participated in organized activities. However, because participation rates did not differ between high- and low-risk subsamples, it could be concluded that individual characteristics that would influence whether or not an adolescent would participate in an organized activity and would also impact externalizing behavior, does not seem to be impactful in this sample. This adds to the literature by demonstrating that the relation between organized activity involvement and reduced externalizing behavior is not likely to be due to a spurious association.

Measurement and structural invariance findings from this study also have theoretic developmental implications. Measurement invariance is useful to determine whether high- and low-risk groups assessed the individual questions in a similar manner, whether they placed similar emphasis on indicators, and whether latent factor means can be compared between groups. Across all 4 models at least partial measurement invariance was achieved. This is important because non-equivalent measurement and structural invariance can confound impacts of predictors on externalizing behaviors over time when all constructs are measured by self-report (Dishman et al., 2004). When differences were found regarding structural invariance, they was found among the variances of externalizing behaviors (delinquency, aggression, and substance use) in Models 1, 2 and 3, and among the covariances of child disclosure and

impulsivity in Model 4. The difference among delinquency, aggression and substance use between the high and low risk group is not surprising given the samples were created using a median-split of externalizing behaviors at Wave 10. Therefore, it can be concluded that differences among pathways between latent factors is a result of group differences and not in different interpretation of the questionnaires.

Past research has shown that measures of strict invariance, while sometimes overly restrictive, is important in determining heterogeneity between groups (Deshon, 2004). Structural invariance analysis in Model 4 demonstrates that youth disclosure significantly differed between low-risk and high-risk subsamples, in terms of means and levels of unexplained variance. This relation of differing disclosure rates among youth who engage in problem behaviors compared to those who do not engage in any problem behavior has support in the literature (Kerr & Stattin, 2000; Willoughby & Hamza, 2011). Youth who engage in risk behaviors have more to hide from parents, and therefore disclose less to parents in an attempt to avoid punishment (Darling, Cumsille, Caldwell, & Dowdy, 2006). For example, a longitudinal study of adolescents found bi-directional links between child disclosure and delinquency, with higher levels of delinquency predicting later lower levels of later youth disclosure (Keijsers et al., 2010). Research has also suggested that adolescent's decision to disclose information to their parents may be context- and situationally-dependent (Darling et al., 2006).

The unexplained variance differences between high- and low-risk groups may be a reflection of how much youth choose to actively hide from their parents, as opposed to how much information they choose to freely disclose. For example, adolescents may actively withhold information from parents that they feel is beyond parent's "right to know", when their

behavior does not violate an explicit rule, or when adolescents fear the emotional or behavioral consequences of disclosure (Darling et al., 2006; Rote & Smetana, 2015). Indeed, what adolescents choose not to tell parents (as opposed to the behaviors they decide to disclose) has been suggested to be a crucial predictor of externalizing behavior (Frijns, Keijsers, Branje, & Meeus, 2010). Overall it appears that differences found between low- and high-risk groups in average levels of disclosure may reflects the bi-directional relationship between levels of parental monitoring and child delinquency rates. Youth who have, on average, lower levels of externalizing behavior, are likely to disclose more information to parents, but it was also found that youth in the high-risk group who disclosed more information had lower levels of later externalizing behavior.

Additionally, the covariance of child impulsivity was found to differ between low-risk and high-risk groups. This is supported in the literature that finds youth who engage in higher levels of risky behavior have greater impulsivity than youth who do not participate in any risk behavior (Mason & Spoth, 2012). However, because child disclosure and impulsivity was frequently found to covary in overall models, the structural invariance between high- and low-risk groups may also reflect an unmeasured variable that is operating differently between the high-risk and low-risk subsamples and impacting both impulsivity and disclosure (Deshon, 2004; Wu, Li, & Zumbo, 2007). One possibility is that home environment, such home chaos levels, or parental characteristics, such as parental receptivity and warmth, impacts both impulsivity and child disclosure (Tilton-Weaver, Kerr, Pakalniskeine, Tokic, Salihovic, & Stattin, 2010). This is in line with Gottfredson and Hirschi's (1990) general theory of criminal engagement, which states that involvement in crime is related to poor self-control, and that self-control is primarily

developed by parental management style and home environment. Therefore, the connection between child disclosure and impulsivity may be a reflection of home environments that place emphasis on structured and consistent parental reactions to misbehavior (Gibbs, Giever, & Martin, 1998). It is also possible this unmeasured variable is related to a general failure of self-regulation, which leads youth to both act more impulsively in the presence of rewards, and to disclose more information to parents (Nigg, 2017).

Across models with the full sample of adolescents, parental monitoring, impulsivity, and gender were found to be the strongest predictors of later adolescent externalizing behavior. Although the amount of explained variance of externalizing behaviors in the overall models is relatively small (between 14.2%-16.1% explained across models), this is a similar amount of explained variance predicted by parenting behaviors from a meta-analysis of 161 studies (Hoeve et al., 2009). This is also consistent with past research that shows while peers may have strong influence on adolescent risk behaviors, parents still matter in late adolescence (Simons-Morton, Haynie, Crump, Eitel, & Saylor, 2001; Wood, Read, Mitchell, & Brand. 2004). However, findings from the structural invariance analyses revealed a more nuanced finding between parental monitoring and externalizing, such that the association was only significant within the high-risk group and was not impactful in the low-risk group. This finding may indicate the relation between parental monitoring and externalizing behaviors may be moderated by past levels of delinquency and substance use.

While past research (which has not differentiated between high- and low-risk subsamples) has demonstrated that parental monitoring is one of the most robust protective factors against later externalizing behavior (Crouter & Head, 2000; Stouthamer-Loeber, Loeber,

Wei, Farrington, & Wikstrom, 2002), similar results have been found when comparing the impact of monitoring between groups who show different levels of externalizing behaviors. For example, within a sample of 692 9th and 10th graders, Borawski, Ievers-Landis, Lovegreen, and Trapl (2003) demonstrated high levels of parental monitoring decreased male adolescent risky sexual activities and alcohol use, but within the female sample, parental monitoring was not associated with any behavioral outcomes. Similarly, in a large-scale study of youth aged 12-17, Neumann and colleagues (2010) found neighborhood risks related to living in low-income communities, impulsivity and parental knowledge, were significant predictors of the antisocial behaviors for males but not for female participants. Therefore, it may be inferred from the structural invariance findings of this study, that group status moderates the relation between parental monitoring and externalizing behaviors. Within groups of adolescents who are at low-risk to engage in externalizing behaviors, other context-dependent factors, such as peer deviancy, and the specific risk behavior, may instead better predict externalizing behaviors instead of parental monitoring (Mason et al., 2015). Within high-risk groups, parental monitoring does seem to play a protective role against later externalizing behavior, which is in line with interventions that find the most effective treatments to reduce adolescent externalizing behavior among high-risk groups involves whole-family, multi-contextual approaches rather than solely targeting adolescents and their behaviors (Dishion & Andrews, 1995).

As with youth disclosure, the reciprocal nature of parental monitoring and externalizing behavior has been questioned, specifically whether youth who show more problem behavior receive lower levels of parental monitoring. This may in part be due to frustration or exacerbation on the part of parents who “give up” trying to monitor or control their children’s

whereabouts and friendships as youth get older (Neumann et al., 2010). Other family-level factors have also been found to relate to increases in adolescent problem behavior and poor monitoring, such as high levels of family conflict, which may create a spurious association between monitoring and externalizing behaviors in this sample (Avry et al., 1999). Overall, due to the correlation nature of this study, it is impossible to prove a causal relation between parental monitoring and externalizing behaviors. However, a substantial body of research points to the relation between parenting and adolescent adjustment difficulties, including delinquency and substance use, as bidirectional and dynamic in nature (Racz & McMahon, 2011; Stice & Barrera, 1995).

Beyond findings related to parental monitoring in overall, measurement, and structural invariance models, there was also significant support for the impact of both individual level predictors of externalizing behavior, namely, child gender and impulsivity, and parental characteristics, such as parental age, on externalizing behaviors. Impulsivity also was found to be a significant predictor of externalizing behavior across both high-risk and low-risk groups. This is consistent with past research that has demonstrated adolescent's ability to self-regulate and avoid sensation seeking is linked to current and future substance use (Nigg, 2017), as well as their engagement in delinquency and aggression. This is also consistent with conceptualization of impulsivity, that is impulsive behaviors are driven by the presence of immediate rewards in the environment, and therefore might impact high- and low-risk samples in similar ways (Stauz & Cooper, 2014; Weichold et al. 2014).

It is interesting to note that in addition to positively relating to levels of externalizing behaviors, impulsivity was significantly negatively related to levels of parental monitoring. This

may be similar to bidirectional impacts of externalizing and levels of parental monitoring, because impulsivity is thought of as a relatively stable trait from childhood to adolescence, more impulsive children may receive lower amounts of parental monitoring over time, in part because of non-compliance from youth and parent's increasing perceptions of powerlessness to control their children's behavior (Glatz, Stattin, & Kerr, 2011). This relation between impulsivity and parental monitoring has been found in other studies of middle adolescence or within samples of middle-class families (Nuemann et al., 2010). For example, Khurana and colleagues (2015) found higher levels of impulsive actions was related to lower levels of parental monitoring among 14 and 15 year olds. This study supports the conclusions that parents who view their children as more impulsive may make fewer efforts to monitor their children's engagement in externalizing behavior.

Similarly, two demographic variables which were used as covariates were found to be significantly related to externalizing and parental monitoring behavior. As expected and in line with background literature, males reported higher levels of externalizing behavior than females (e.g. Monahan et al., 2013; Trucco et al., 2014) and females reported higher levels of perceived parental monitoring (Li et al., 2000). Males and females did not differ in other factors in overall models, such as levels of impulsivity, or their likelihood of high-risk or low-risk group membership. This implies other biological or social forces may encourage or excuse greater externalizing behaviors among male adolescents, particularly those who grow up in low-income, urban environments (Richards et al., 2004). Further, parental age was significantly and negatively related to externalizing behaviors. This is consistent with research that suggested older parents, particularly among low-income populations, may have more experience or

resources when raising their children and have children who are at lower-risk to engage in problem behaviors (Tearne, 2015).

There was little support for hypotheses related to organized activity participation and lower levels of externalizing behaviors in both overall and measurement invariance analyses. Overall, different dimensions of organized activity participation had few effects, with the exception of breadth of activity participation which was predictive of lower levels of externalizing behaviors among the low-risk sample. This is contrary to the main hypotheses of this study. There may be several reasons for these findings. First, participation in organized activities was found to be extremely high in this sample (96% reported participating in at least 1 activity over the course of 2 years). Therefore, it was impossible to compare the impacts of a dichotomous any participation versus no participation in organized activities, which may have impacted adolescent's externalizing behaviors. This result is in line with past research which has found that among samples of youth who all participate in afterschool activities, the frequency or intensity of participation does not seem to have much impact (Roth, Malone, & Brooks-Gunn, 2010).

Organized activity intensity and duration were not significant predictors in multigroup or overall models, which contradicts past literature that has found intensity and duration of organized activities to be protective for low-income, ethnic minority youth (Dotter et al., 2007; Gardner et al., 2008). Research has suggested the comparison of non-participating versus participating youth is what seems to play a more significant difference on academic, behavioral, and socio-emotional outcomes instead of comparing levels of participation among youth who all participate (Roth et al., 2010). Although there were no differences among organized activity

participation between the initial intervention, booster program, and control group, it is possible that selection effects of the families that decided to participate in the original SAFE Children intervention study differentiate them from the larger population of low-income, ethnic minority families. That is, families who agreed to participate in the initial study may be more willing or motivated to enroll their children in afterschool organized activities compared to the general population of "inner city" families. This theory is supported given the high rate of organized activity participation among this sample that has multiple characteristics that traditionally predict low rates of participation (i.e. ethnic-minority, low-income, older adolescents, Pedersen & Seidman, 2005). Taken together, the findings from this study are in line with research that shows any amount of participation may be protective for low-income, ethnic minority adolescents, and that few impacts may be seen across different participants.

Across all models only organized activity dimension that was found to be related to lower levels of externalizing behavior was breadth of participation (which includes summertime activity involvement) among the low-risk group. This suggests youth may gain extra competencies and skills from multiple types of activity involvement, across different time points in the year, to be better able to resist pressures or temptation to engage in externalizing behaviors. For example, youth involved in both team-sports and fine arts programs have opportunities to develop cooperation and initiative, while also developing perceived self-competence in both areas (Hansen et al., 2003; Larson et al., 2006). Further, participating in a wider array of activities may expose youth to different types of peers. This may increase social bonds, exposure to new peers with diverse backgrounds and perspectives, and spend time with

youth who do not engage in risky behaviors. However, these skills may not be enough to resist risky behavior once adolescents have already begun engaging in externalizing behaviors.

The finding that greater diversity in organized activity participation, including summertime programs, can be protective against externalizing behavior is in line with research that demonstrates breadth of participation is related to better developmental outcomes (Bohnert, McLeod, Marshall, & Grant, 2016; Fredricks & Eccles, 2006; 2010). Busseri and Rose-Krasnor (2010) also found breadth of participation was related to lower levels of risk behaviors using a latent composite model. In the same model, Busseri and Rose-Krasnor (2010) similarly did not find that intensity of involvement was related to lower levels of risk behavior. This may imply that past research that has examined just frequency or intensity of participation may be confounded by the overlap with breadth of participation (i.e. involvement in multiple types of organized activities would be positively associated with more frequent organized activity involvement). This was reflected in the model that examined multiple dimensions of organized activity involvement, which showed a significant correlation between organized activity frequency and breadth. This may explain why in the low-risk sample, organized activity breadth was no longer a significant predictor of externalizing behavior. Overall, the personal and social competencies gained from having a wide breadth of activities may be overlooked as a dimension of organized activity participation.

This finding is also interesting, because other studies of organized activity breadth has found limited or detrimental impacts of participation in multiple activity categories (Agans et al., 2014; Bohnert et al., 2010; Fredricks & Eccles, 2010). Detrimental impacts may not have been found in this sample due to the limited number of activity categories examined. While past

studies have found declining impacts from participation in 6 or more activity categories (Fredrick & Eccles, 2010), the maximum number of activity categories for this study was 4. This may be due to one limitation of this study, such that that school- and community based activities were not differentiated by more specific activity types (e.g. theater, fine arts, debate, etc.). It is possible with a greater differentiation between activity categories, a diminishing effect on breadth of organized activities and externalizing behaviors may have been found.

Although at least one study has found that when examined simultaneously, greater breadth and intensity of participation over time did not uniquely predict risky behavior or internalizing behaviors (Denault & Poulin, 2009). One possible reason for the lack of findings regarding organized activity participation may be the overlap in parental monitoring and organized activity participation. For example, because parental monitoring includes strategies to minimize or control how youth spend their time while unsupervised, it may be thought that parental monitoring is a more important predictor of adolescent's leisure activities whereas organized activity participation is an outcome or results of higher levels of monitoring. This is supported in the analyses of Model 1, which found a significant correlation between the latent variables for parental monitoring and organized activity intensity. To my knowledge, few studies examined the overlap between parental monitoring and organized activity participation in reducing adolescent risk behaviors (Coley, et al., 2004; Kristjansson, James, Allegrante, Sigfusdottir, & Halgason, 2010). Research regarding parental monitoring instead focuses on the frequency in which youth spend in unstructured activities (Caldwell & Darling, 1999) rather than the amount of time they spend in structured activities.

Further, other factors related to organized activity involvement, beyond dimensions of participation, such as quality of programming and engagement with materials, may be more important in influencing adolescent behavior beyond just measuring participation (Bohnert et al., 2010, Vandell & Posner, 1999). It is possible youth in this sample who engaged in organized activities either through their school or through community programs were not exposed to low-quality programs, programs with a lack of structure, or show little engagement or emotional connection to the material. For example, programs that do not meet standards for high-quality programming (Eccles & Gootman, 2002), may not provide structure and supervision for the youth attending the programs, in which case participation has been linked to increases in antisocial behaviors (Durlak, &Weissberg, 2007; Mahoney, Stattin, & Lord, 2004, Vandell, Shumow, & Posner, 2005). While high-quality programs have been found to exist within low-income neighborhoods (Vandell et al., 2005), low-income neighborhoods may face significant challenges in providing the staffing, facilities, and finances to maintain high-quality organized activities (Halpern, 1999). Therefore, it could be that quality of the organized activities in which the participants of this study were enrolled, did not meet sufficient levels to fully engage and motivate participants to decrease externalizing behaviors over time.

This study had a few limitations that may affect the interpretation of results. As previously stated, participants in this longitudinal study were not selected randomly, and therefore results may not generalize to the population of low-income, ethnic minority families as a whole. Moreover, measures of activity participation may have been too broad to capture unique contributions to externalizing behavior. Past literature has shown small to moderate effect sizes for organized activity participation on delinquency and substance use (Mahoney & Vest, 2012),

so it is possible in this study measures of organized activity involvement were not specific enough to capture unique effects. For example, questions regarding summertime program participation was formatted as a yes/no question, therefore reducing variability in participant's responses. Similarly, measures of school-time organized activity intensity was coded for organized activity participation in the past month was coded on a 4-point Likert scale rather than direct measures of hours per week spent in each activity. Direct and specific measures of organized activity involvement can directly impact whether developmental outcomes related to participation are found (Bohnert et al., 2010). Additionally, organized activity involvement can vary from month to month depending on other time commitments and requirements of participation depending on season (i.e. sport schedules may become more intense during certain parts of the year), while this study broadly asked participants to think how much they participated "in the past year". Multiple assessments of school-time participation at different time points during the year, would give a fuller picture of organized activity participation and consistency of participation across multiple years.

Future longitudinal studies may further examine the relation between parental monitoring, and the decision to enroll children in organized activities. Organized activities may be indirectly related to reductions in externalizing behavior due to their impact on parental monitoring, or may be an outcome related to parental monitoring. Cross-lagged longitudinal studies therefore can help to determine directionality and significant relation between parental monitoring and organized activity participation over time. Future experimental designs could also disentangle the impacts of organized activities on levels of parental monitoring and the impact of self-selection in organized activities on externalizing behaviors. The study has several

important implications. Although unique impacts from organized activities were not found in this study, if indeed any organized activity participation is protective for low-income, ethnic minority adolescents, greater resources should be dedicated to promoting or providing high-quality programming. Because breadth of participation was found to be protective in the low-risk sample, parents and schools should emphasize that adolescents try new and diverse types of activities, particularly among youth who are already protected against externalizing behaviors. Further, parental monitoring was found to be one of the most consistent and important predictors of later externalizing behavior, particularly for the high-risk subsample. Interventions that are designed to reduce externalizing behaviors among at-risk or high-risk groups should target both adolescent and parent behaviors in multiple contexts. There was significant associations between impulsivity and parental monitoring, also suggesting that parents should be coached to provide additional supports for children they feel are impulsive or who lack self-control. Therefore, interventions that target family processes and increase parental monitoring, rather than solely focus on adolescent behavior, may be more effective at reducing engagement in externalizing behaviors.

In conclusion, these findings suggest that parental monitoring may be the most significant predictor in low-income, ethnic minority adolescent's externalizing behaviors. However, this may be particularly valuable in preventing externalizing behavior among adolescents who are already engaging in higher levels of risk or for children who demonstrate high levels of impulsivity. While organized activities did not seem to play an important role in reducing risk behavior, the high levels of organized activity participation among this sample may fail to distinguish organized activities as a protective context when compared to youth who do not

participate in any amount of organized activity. Overall, despite nearing the end of adolescence, youth still need to rely on adult guidance to avoid circumstances that may endanger themselves or others.

REFERENCE LIST

Abar, C. C., Jackson, K. M., & Wood, M. (2014). Reciprocal relations between perceived parental knowledge and adolescent substance use and delinquency: The moderating role of parent-teen relationship quality. *Developmental Psychology, 50,* 2176-2187. doi: 10.1037/a0037463

Abar, C. C., Jackson, K. M., Colby, S. M., & Barnett, N. P. (2014). Common and unique parenting predictors of adolescent tobacco and alcohol use. *Addictive Behaviors, 39,* 1528-1532. doi: 10.1016/j.addbeh.2014.06.003

Achenbach, T. M., Dumenci, L., &. Rescorla, L. A. (2003) DSM-Oriented and empirically based approaches to constructing scales from the same item pools. *Journal of Clinical Child and Adolescent Psychology, 32,* 328-340, doi: 10.1207/ S15374424JCCP3203_02

Akiva, T., Cortina, K. S., Eccles, J. S., & Smith, C. (2013). Youth belonging and cognitive engagement in organized activities: A large-scale field study. *Journal of Applied Developmental Psychology, 34,* 208-218. doi: 10.1016/j.appdev.2013.05.001

Albert, D., Chein, J., & Steinberg, L. (2013). The teenage brain: Peer influences on adolescent decision making. *Current Directions in Psychological Science, 22,* 114-120. doi: 10.1177/0963721412471347

Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin, 103,* 411-423. doi: 10.1037/0033-2909.103.3.411

Andrade, F. H. (2013). Can the school context moderate the protective effect of parental support on adolescents' alcohol trajectories in urban Chicago? *Drug and Alcohol Dependence, 133,* 330-337. doi: 10.1016/j.drugalcdep.2013.06.010

Arnett, J. J., & Taber, S. (1994). Adolescence terminable and interminable: When does adolescence end? *Journal of Youth and Adolescence, 23,* 517-537. doi: 101007/BF01537734

Atkins, S. M., Bunting, M. F., Bolger, D. J., & Dougherty, M. R. (2012). Training the adolescent brain: Neural plasticity and the acquisition of cognitive abilities. In V. F. Reyna, S. B. Chapman, M. R. Dougherty, & J. Confrey (Eds.), *The adolescent brain: Learning, reasoning, and decision making.* (pp. 211-241). Washington, DC: American Psychological Association.

Bandura, A., Caprara, G. V., Barbaranelli, C., Gerbino, M., & Pastorelli, C. (2003). Role of affective self-regulatory efficacy in diverse spheres of psychosocial functioning. *Child Development, 74,* 769-782. doi: 10.1111/1467-8624.00567

Barber, B. K. (1996). Parental psychological control: Revisiting a neglected construct. *Child Development, 67,* 3296-3319. doi: 10.1111/j.1467-8624.1996.tb01915.x

Barber, B. K., Olsen, J. E., & Shagle, S. C. (1994). Associations between parental psychological and behavioral control and youth internalized and externalized behaviors. *Child Development, 65,* 1120-1136. doi: 10.1111/j.1467-8624.1994.tb00807.x

Barber, B. K., Stolz, H. E., Olsen, J. A., Collins, A., & Burchinal, M. (2005). Parental support, psychological control, and behavioral control: Assessing relevance across time, culture, and method. *Monographs of the Society for Research in Child Development, 70,* 1-147. Retrieved from http://www.jstor.org/stable/3701442

Barnes, G., Farrell, M. P., & Banerjee, S. (1994). Family influences on alcohol abuse and other problem behaviors among Black and White adolescents in a general population sample. *Journal of Research on Adolescence, 4,* 183-201. doi: 10.1207/s15327795jra0402_2

Bartko, W. T., & Eccles, J. S. (2003). Adolescent participation in structured and unstructured activities: A person-oriented analysis. *Journal of Youth and Adolescence, 32,* 233-241. doi: 10.1023/A:1023056425648

Bean, R. A., Barber, B. K., & Crane, D. R. (2007). Parental support, behavioral control, and psychological control among African American youth: The relationships to academic grades, delinquency, and depression. *Journal of Family Issues, 27,* 1335-1355. doi: 10.1177/0192513X06289649

Beck, K. H., Boyle, J. R., & Boekeloo, B. O. (2004). Parental monitoring and adolescent drinking: Results of a 12-month follow up. *American Journal of Health Behavior, 28,* 272-279. doi: 10.5993/AJHB.28.3.8

Bjork, J. M., Lynee-Lansman, S. D., Sirocco, K., & Boyce, C. A. (2012). Brain maturation and risky behavior: The promise and challenges of neuroimaging-based accounts. *Child Development Perspectives, 6,* 385-391. doi:10.1111/cdep.12001

Blakemore, S., & Robbins, T. W. (2012). Decision-making in the adolescent brain. *Nature Neuroscience, 15,* 1184-1191. doi: 10.1038/nn.3177

Blustein, E. C., Munn-Chernoff, M. A., Grant, J. D., Sartor, C. E., Waldron, M., Bucholz, K. K., ... & Heath, A. C. (2015). The association of low parental monitoring with early substance use in European American and African American adolescent girls. *Journal of Studies on Alcohol and Drugs, 76,* 852-861. doi:10.15288/jsad.2015.76.852

Bohnert, A., Fredricks, J., & Randall, E. (2010). Capturing unique dimensions of youth organized activity involvement: Theoretical and methodological considerations. *Review of Educational Research, 80,* 576-610. doi: 10.3102/0034654310364533

Bohnert, A. M., Ward, A. K., Burdette, K. A., Silton, R. L., & Dugas, L. R. (2014). Active summers matter: Evaluation of a community-based summertime program targeting obesogenic behaviors of low-income, ethnic minority girls. *New Directions for Youth Development, 143,* 133-150. doi: 10.1002/yd.20107

Bollen, K. A., & Bauldry, S. (2011). Three Cs in measurement models: Causal indicators, composite indicators, and covariates. *Psychological Methods, 16,* 265-284. doi: 10.1037/a0024448.

Borawski, E. A., Ievers-Landis, C. E., Lovegreen, L. D., & Trapl, E. S. (2003). Parental monitoring, negotiated unsupervised time, and parental trust: The role of perceived parenting practices in adolescent health risk behaviors. *Journal of Adolescent Health, 33,* 60-70. doi: 10.1016/S1054-139X(03)00100-9

Bowers, E. P., Li, Y., Kiely, M. K., Brittian, A., Lerner, J. V., & Lerner, R. M. (2010). The Five Cs model of positive youth development: A longitudinal analysis of confirmatory factor structure and measurement invariance. *Journal of Youth and Adolescence, 39,* 720-735. doi: 10.1007/s10964-010-9530-9

Bradley, R. H., & Corwyn, R. F. (2002). Socioeconomic status and child development. *Annual Review of Psychology, 53,* 371-399. doi: 10.1146/annurev.psych.53.100901.135233

Briere, F. N., Fallu, J. S., Morizot, J. & Janosz, M. (2014). Adolescent illicit drug use and subsequent academic and psychosocial adjustment: An examination of socially-mediated pathways. *Drug and Alcohol Dependence, 135,* 45-51. doi:10.1016/j.drugalcdep.2013.10.029

Brooks-Gunn, J., & Duncan, G. (1997). The effects of poverty on children. *The Future of Children, 7,* 55-71. doi: 10.2307/1602387

Brooks-Russell, A., Farhat, T., Haynie, D., & Simons-Morton, Bruce. (2014). Trends in substance use among 6th- to 10th-grade students from 1998 to 2010: Findings from a national probability study. *The Journal of Early Adolescence, 34,* 667-680. doi: 10.1177/0272431613501409

Brown, B. B., & Bakken, J. P. (2011). Parenting and peer relationships: Reinvigorating research on family-peer linkages in adolescence. *Journal of Research on Adolescence, 21,* 153-165. doi: 10.1111/j.1532-7795.2010.00720.x

Brown, B. B., Clasen, D. R., & Eicher, S. A. (1986). Perceptions of peer pressure, peer conformity dispositions, and self-reported behavior among adolescents. *Developmental Psychology, 22,* 521-530. doi: 10.1037/0012-1649.22.4.521

Brown, S. A., & Tapert, S. F. (2004). Adolescence and the trajectory of alcohol use: Basic to clinical studies. *Annals of the New York Academy of Sciences, 1021,* 234-244. doi: 10.1196/annals.1308.028

Burke, J. D., Pardini, D. A., & Loeber, R. (2008). Reciprocal relationships between parenting behavior and disruptive psychopathology from childhood through adolescence. *Journal of Abnormal Child Psychology, 36,* 679-692. doi: 10.1007/s10802-008-9219-7

Burt, S. A., Barnes, A. R., McGue, M., & Iacono, W. G. (2008). Parental divorce and adolescent delinquency: Ruling out the impact of common genes. *Developmental Psychology, 44,* 1668-1677. doi: 10.1037/a0013477

Busseri, M. A., & Rose-Krasnor, L. (2009). Breadth and intensity: Salient, separable, and developmentally significant dimensions of structured activity involvement. *British Journal of Developmental Psychology, 27,* 907-933. doi: 10.1348/026151008X397017

Busseri, M. A., & Rose-Krasnor, L. (2010). Addressing three common issues in research on youth activities: An integrative approach for operationalizing and analyzing involvement. *Journal of Research on Adolescence, 20,* 583-615. doi: 10.1111/j.1532-7795.2010.00652.x

Busseri, M. A., Rose-Krasnor, L., Willoughby, T., & Chalmers, H. (2006). A longitudinal examination of breadth and intensity of youth activity involvement and successful development. *Developmental Psychology, 42,* 1313-1326. doi: 10.1037/0012-1649.42.6.1313

Camacho, D. E., & Fuligni, A. J. (2015). Extracurricular participation among adolescents from immigrant families. *Journal of Youth and Adolescence, 44,* 1251-1262. doi: 10.1007/s10964-014-0105-z

Casey, B. J., & Caudle, K. (2013). The teenage brain: Self-control. *Current Directions in Psychological Science, 22,* 82-87. doi: 10.1177/0963721413480170

Casey, D. M., Ripke, M. N. & Huston, A. C. (2010). Activity participation and the well-being of children and adolescents in the context of welfare reform. In J. L. Mahoney, R. W. Larson, & J. S. Eccles (Eds), *Organized activities as contexts of development: Extracurricular activities, after-school and community programs* (pp. 65-84). Mahway, NJ: Lawrence Erlbaum Associates.

Catalano, R. F., Berglund, M. L., Ryan, J. A. M., Lonczak, H. S., & Hawkins, J. D. (2004). Positive youth development in the United States: Research findings on evaluations of positive youth development programs. *The ANNALS of the American Academy of Political and Social Science, 591,* 98-124. doi: 101177/0002716203260102

Center for Disease Control and Prevention (2015). *Fact sheets-Underage drinking,* Retrieved from http://www.cdc.gov/alcohol/fact-sheets/underage-drinking.htm

Chapman, S. B., Gamino, J. F., & Mudar, R. A. (2012). Higher order strategic gist reasoning in adolescence. In V. F. Reyna, S. B. Chapman, M. R. Dougherty, & J. Confrey (Eds.). *The adolescent brain: Learning, reasoning, and decision making.* (pp. 123-151). Washington, DC: American Psychological Association.

Chen, X., & Adams, M. (2010). Are teen delinquency abstainers social introverts? A test of Moffitt's theory. *Journal of Research in Crime and Delinquency, 47,* 439-468. doi: 10.1177/0022427810375575

Chen, E. & Berdan, L. E. (2006). Socioeconomic status and patterns of parent-adolescent interactions. *Journal of Research on Adolescence, 16,* 19-27. doi: 10.1111/j.1532-7795.2006.00117.x

Christakou, A., Gershman, S. J., Niv, Y., Simmons, A., Brammer, M., & Rubia, K. (2013). Neural and psychological maturation of decision-making in adolescence and young adulthood. *Journal of Cognitive Neuroscience, 25,* 1807-1823. doi: 10.1162/jocn_a_00447

Cleveland, M. J., Feinberg, M. E., & Jones, D. E. (2012). Predicting alcohol use across adolescence: Relative strength of individual, family, peer, and contextual risk and protective factors. *Psychology of Addictive Behaviors, 26,* 703-713. doi:10.1037/a0027583

Cleveland, M. J., Gibbons, F. X., Gerrard, M., Pomery, E. A., & Brody, G. H. (2005). The impact of parenting on risk cognitions and risk behavior: A study of mediation and moderation in a panel of African American adolescents. *Child Development, 76,* 900-916. doi:10.1111/j.1467-8624.2005.00885.x

Coley, R. L., Morris, J. E., & Hernandez, D. (2004). Out-of-school care and problem behavior trajectories among low-income adolescents: Individual, family, and neighborhood characteristics as added risks. *Child Development, 75,* 948-965. doi: 10.1111/j.1467-8624.2004.00716.x

Coley, R. L., Sims, J., Dearing, E., & Spielvogel, B. (2017). Locating economic risks for adolescent mental and behavioral health: poverty and affluence in families, neighborhoods, and schools. *Child Development*. Online Early View. doi: 10.1111/cdev.12771

Cottrell, L., Li, X., Harris, C., D'Alessandri, D., Atkins, M., Richardson, B. & Stanton, B. (2003). Parent and adolescent perceptions of parental monitoring and adolescent risk involvement. *Parenting: Science and Practice, 3,* 179-195. doi:10.1207/S15327922PAR0303_01

Criss, M. M., Shaw, D. S., Moilanen, K. L., Hitchings, J. E., & Insgoldsby, E. M. (2009). Family, neighborhood, and peer characteristics as predictors of child adjustment: A longitudinal analysis of additive and mediation models. *Social Development, 18,* 511-535. doi: 10.1111/j.1467-9507.2008.00520.x

Damon, W. (2004). What is positive youth development? *The Annals of the American Academy of Political and Social Science,* 591, 13-24. doi: 10.1177/0002716203260092

Darling, N. (2005). Participation in extracurricular activities and adolescent adjustment: Cross-sectional and longitudinal findings. Journal of Youth and Adolescence, 34, 493-505. doi: 10.1007/s10964-005-7266-8

Darling, N., Cumsille, P., Caldwell, L. L., & Dowdy, B. (2006). Predictors of adolescent disclosure to parents and perceived parental knowledge: Between- and within-person differences. *Journal of Youth and Adolescence, 35,* 667-678. doi: 10.1007/s10964-006-9058-1

Denault, A. S., & Poulin, F. (2009). Intensity and breadth of participation in organized activities during the adolescent years: Multiple associations with youth outcomes. *Journal of Youth and Adolescence, 38,* 1199-1213. doi: 10.1007/s10964-009-9437-5

Denault, A. S., Poulin, F., & Pedersen, S. (2009). Intensity of participation in organized youth activities during the high school years: Longitudinal associations with adjustment. *Applied Developmental Science, 13,* 74-87. doi: 10.1080/10888690902801459

Deshon, R. P. (2004). Measures are not invariant across groups with error variance homogeneity. *Psychology Science, 46,* 137-149. doi: 2004-19990-008

DeWit, D. J., Adlaf, E. M., Offord, D. R., & Ogborne, A. C. (2000). Age at first alcohol use: A risk factor for the development of alcohol disorders. *The American Journal of Psychiatry, 157,* 745-750. doi: 10.1176/appi.ajp.157.5.745

DiClemente, R. J., Wingood, G. M., Crosby, R., Sionean, C., Cobb, B K, & Oh, M. K. (2001). Parental monitoring: Associations with adolescents' risk behaviors. *Pediatrics, 107,* 1363-1368. doi: 101542/peds10761363

Dillon, F. R., Pantin, H., Robbins, M. S., & Szapocznik, J. (2008). Exploring the role of parental monitoring of peers on the relationship between family functioning and delinquency in the lives of African American and Hispanic adolescents. *Crime & Delinquency, 54,* 65-94. doi:10.1177/0011128707305744

Dishion, T. J., & Andrews, D. W. (1995). Preventing escalation in problem behaviors with high-risk young adolescents: Immediate and 1-year outcomes. *Journal of Consulting and Clinical Psychology, 63,* 538-548. doi: 10.1037/0022-006X.63.4.538

Dishion, T. J., McCord, J., Poulin, F. (1999). When interventions harm: Peer groups and problem behaviors. *American Psychologist, 54,* 755-764. doi: 10.1037/0003-066X.54.9.755

Dishion, T. J., Nelson, S. E., & Bullock, B. M. (2004). Premature adolescent autonomy: Parent disengagement and deviant peer process in the amplification of problem behavior. *Journal of Adolescence, 27,* 515-530. doi: 10.1016/j.adolescence.2004.06.005

Dishion, T. J. & Tipsord, J. M. (2011). Peer contagion in child and adolescent social and emotional development. *Annual Review of Psychology, 62*, 189-214. doi:10.1146/annurev.psych.093008.100412

Dishman, R. K., Motl, R. W., Saunders, R., Felton, G., Ward, D. S., Dowda, M., & Pate, R. R. (2004). Self-efficacy partially mediates the effects of a school-based physical-activity intervention among adolescent girls. *Prevention Medicine, 38,* 628-636. doi: 101.106/j.ypmed.2003.12.007

Dotterer, A. M., Lowe, K., & McHale, S. M. (2014). Academic growth trajectories and family relationships among African American youth. *Journal of Research on Adolescence, 24,* 734-747. doi: 10.1111/jora.12080

Durlak, J. A., Weissberg, R. P., & Pachan, M. (2010). A meta-analysis of after-school programs that seek to promote personal and social skills in children and adolescents. *American Journal of Community Psychology, 45,* 294-309. doi: 10.1007/s10464-010-9300-6

Eccles, J. S., & Barber, B. L. (1999). Student council, volunteering, basketball, or marching band: What kind of extracurricular involvement matters? *Journal of Adolescent Research, 14,* 10-43. doi: 10.1177/0743558499141003

Eccles, J., & Gootman, J. A. (2002). *Community programs to promote youth development*. Washington, DC: Committee on Community-Level Programs for Youth Board on Children, Youth and Families, Commission on Behavioral and Social Sciences Education, National Research Council and Institute of Medicine.

Enders, C. K., & Bandalos, D. L. (2001). The relative performance of full information maximum likelihood estimation for missing data in structural equation models. *Structural Equation Modeling, 8,* 430-457. doi: 10.1207/S15328007SEM0803_5

Epstein, M., Hill, K. G., Bailey, J. A., & Hawkins, J. D. (2013). The effect of general and drug-specific family environments on comorbid and drug-specific problem behavior: A longitudinal examination. *Developmental Psychology, 49,* 1151-1164. doi: 10.1037/a0029309

Farb, A. F., & Matjasko, J. L. (2012). Recent advances in research on school-based extracurricular activities and adolescent development. *Developmental Review, 32, 1*-48. doi: 10.1016/j.dr.2011.10.001

Federal Interagency Forum on Child and Family Statistics (2015). *America's children: Key national indicators of well-being, 2015*. Retrieved from http://www.childstats.gov/americaschildren/beh_fig.asp#beh5

Ferrer, E., Whitaker, K. J., Steele, J. S., Green, C. T., Wendelken, C., & Bunge, S. A. (2013). White matter maturation supports the development of reasoning ability through its influence on processing speed. *Developmental Science, 16,* 941-951. doi: 10.1111/desc.12088

Finkenauer, C., Engels, R. C. M. E., & Baumeister, R. F. (2005). Parenting behavior and adolescent behavioural and emotional problems: The role of self-control. *International Journal of Behavioral Development, 29,* 58-69. doi: 10.1080/01650250444000333

Flanagan, C. A., Kim, T., Collura, J., & Kopish, M. A. (2015). Community service and adolescents' social capital. *Journal of Research on Adolescence, 25,* 295-309. doi: 10.1111/jora.12137

Flannery, D. J., Williams, L. L., & Vazsonyi, A. T. (1999). Who are they with and what are they doing? Delinquent behavior, substance use, and early adolescents' after-school time. *American Journal of Orthopsychiatry, 69,* 247-253. doi: 10.1037/h0080426

Fletcher, A. C., Steinberg, L., & Williams-Wheeler, M. (2004). Parental influences on adolescent problem behavior: Revisiting Stattin and Kerr. *Child Development, 75,* 781-796. doi: 10.1111/j.1467-8624.2004.00706.x

Fredricks, J. A. (2011). Engagement in School and Out-of-School Contexts: A Multidimensional View of Engagement. *Theory into Practice, 50,* 327-335. doi: 10.1080/00405841.2011.607401

Fredricks J. A., & Eccles, J. S. (2006a). Extracurricular involvement and adolescent adjustment: The impact of duration, number of activities, and breadth of participation. *Applied Developmental Science, 10,* 132-146. doi: 10.1207/s1532480xads1003_3

Fredricks J. A., & Eccles, J. S. (2006b). Is extracurricular participation associated with beneficial outcomes? Concurrent and longitudinal relations. *Developmental Psychology, 42,* 698-713. doi: 10.1037/0012-1649.42.4.698

Fredricks, J. A., & Simpkins, S. D. (2013). Organized out-of-school activities and peer relationships: Theoretical perspectives and previous research. *New Directions for Child and Adolescent Development, 140,* 1-17. doi: 10.1002.cad/20034

Fredricks, J. A., Bohnert, A. M., & Burdette, K. (2014). Moving beyond attendance: Lessons learned from assessing engagement in afterschool contexts. *New Directions for Youth Development, 144,* 45-58. doi: 10.1002/yd.20112

Frijins, T., Keijesers, L., Branje, S., & Meeus, W. (2010). What parents don't know and how it may affect their children: Qualifying the disclosure-adjustment link. *Journal of Adolescence, 33,* 261-270. doi: 10.1016/j.adolescence.2009.05.010

Fuligini, A. J., & Eccles, J. S. (1993). Perceived parent-child relationships and early adolescents' orientation toward peers. *Developmental Psychology, 29,* 622-632. doi: 10.1037/0012-1649.29.4.622

Galván, A. (2012). Risky behavior in adolescents: The role of the developing brain. In V. F. Reyna, S. B. Chapman, M. R. Dougherty, & J. Confrey (Eds.). *The adolescent brain: Learning, reasoning, and decision making.* (pp. 267-289). Washington, DC: American Psychological Association.

Gardner, M. Browning, C., & Brooks-Gunn, J. (2012). Can organized youth activities protect against internalizing problems among adolescents living in violent homes? *Journal of Research on Adolescence, 22,* 662-677. doi: 10.1111/j.1532-7795.2012.00811.x

Gardner, M., Roth, J., & Brooks-Gunn, J. (2008). Adolescents' participation in organized activities and developmental success 2 and 8 years after high school: Do sponsorship, duration, and intensity matter? *Child Development, 44,* 814-830. doi: 10.1037/0012-1649.44.3.814

Garbarino, J., Sebes, J., & Schellenbach, C. (1984). Families at risk for destructive parent-child relations in adolescence. *Child Development, 55,* 174-183. doi: 10.2307/1129843

Gibbs, J. J., Giever, D., & Martin, J. S. (1998). Parental management and self-control: An empirical test of Gottfredson and Hirschi's general theory. *Journal of Research in Crime and Delinquency, 35,* 40-70. doi: 10.1177/0022427898035001002

Glatz, T., Stattin, H., & Kerr, M. (2011). Parents' reactions to youths' hyperactivity, impulsivity, and attention problems. *Journal of Abnormal Child Psychology, 39,* 1125-1135. doi: 10.1007/s10802-011-9541-3

Goerge, R. M., & Chaskin, R. J. (2004). *What ninth grade students in the Chicago public schools do in their out-of-school time: Preliminary results.* Retrieved from https://www.chapinhall.org/sites/default/files/old_reports/119.pdf

Goldstein, S. E. (2015). Adolescents' disclosure and secrecy about peer behavior: Links with cyber aggression, relational aggression, and overt aggression. *Journal of Child and Family Studies, 25,* 1430-1440. doi:10.1007/s10826-015-0340-2

Gottfredson, D. C., Gerstenblith, S. A., Soulé, D. A., Womer, S. C., & Lu, S. (2004). Do after school programs reduce delinquency? *Prevention Science, 5,* 253-266. doi: 10.1023/B:PREV.0000045359.41696.02

Grant, B. F. & Dawson, D. A. (1997). Age of onset of alcohol use and its association with DSM-IV alcohol abuse and dependency: Results from the National Longitudinal Alcohol Epidemiologic Survey. *Journal of Substance Abuse, 9,* 103-110. doi: 10.1016/S0899-3289(97)90009-2

Grant, B. F. & Dawson, D. A. (1998). Age of onset of drug use and its association with DSM-IV drug abuse and dependency: Results from the National Longitudinal Alcohol Epidemiologic Survey. *Journal of Substance Abuse, 10,* 163-173. doi: 10.1016/S0899-3289(99)80131-X

Gratz, K. L., & Roemer, L. (2004). Multidimensional assessment of emotion regulation and dsyregulation: Development, factor structure, and initial validation of the difficulties in emotion regulation scale. *Journal of Psychopathology and Behavioral Assessment. 26,* 41- 54. doi: 10.1023/B:JOBA.0000007455.08539.94

Greene, K. M., Lee, B., Constance, N., & Hynes, K. (2013). Examining youth and program predictors of engagement in out-of-school time programs. *Journal of Youth and Adolescence, 42,* 1557-1572. doi: 10.1007/s10964-012-9814-3

Gruber, S. A., Dahlgren, M. K., Sagar, K. A., Gonenc, A., & Lukas, S. E. (2014). Worth the wait: Effects of age of onset of marijuana use on white matter and impulsivity. *Psychopharmacology, 231,*1455-1465. doi: 10.1007/s00213-013-3326-z

Guerri, C. & Pascual, M. (2010). Mechanisms involved in the neurotoxic, cognitive, and neurobehavioral effects of alcohol consumption during adolescence, *Alcohol, 44,* 15-26. doi: 10.1016/j.alcohol.2009.10.003

Guilamo-Ramos, V., Jaccard, J., & Dittus, P. (2010). *Parental Monitoring of Adolescents: Current Perspectives for Researchers and Practitioners.* Columbia University Press: New York

Gutman, L. M., McLoyld, V. C., & Tokoyawa, T. (2005). Financial strain, neighborhood stress, parenting behaviors, and adolescent adjustment in urban African American families. *Journal of Research on Adolescence, 15,* 425-449. doi: 10.1111/j.1532-7795.2005.00106.x

Hadley, W., Houck, C. D., Barker, D., & Senocak, N. (2015). Relationships of parental monitoring and emotion regulation with early adolescents' sexual behaviors. *Journal of Developmental and Behavioral Pediatrics, 36,* 381-388. doi:10.1097/DBP.0000000000000160

Hair, E. C., Park, M. J., Ling, T. J., & Moore, K. A. (2009). Risky behaviors in late adolescence: Co-occurrence, predictors, and consequences. *Journal of Adolescent Health, 45,* 253-261. doi: 10.1016/j.adohealth.2009.02.009

Hall, G., Yohalem, N., Tolman, J., Wilson, A. (2003). How afterschool programs can most effectively promote positive youth development as a support to academic achievement: A report commissioned by the Boston After-School for all Partnership. National Institute on Out-of-School Time and the Forum for Youth.

Hamilton, S. F., Hamilton, M. A., & Pittman, K. (2004). Principles for youth development. In S. F. Hamilton & M. A. Hamilton (Eds.) *The Youth Development Handbook: Coming of Age in American Communities* (pp. 3-22). Thousand Oaks CA, US: Sage Publications

Hansen, D.M., Larson, R. W., & Dworkin, J. B. (2003). What adolescents learn in organized youth activities: A survey of self-reported developmental experiences. *Journal of Research on Adolescence, 13,* 25–55. doi: 10.1111/1532-7795.1301006

Hardaway, C. R., & Cornelius, M. D. (2014). Economic hardship and adolescent problem drinking: Family processes as mediating influences. *Journal of Youth and Adolescence, 43(7),* 1191-1202. doi: 10.1007/s10964-013-0063-x

Hartos, J. L., Beck, K. H., & Simons-Morton, B. G. (2004). Parents' intended limits on adolescents approaching unsupervised driving. *Journal of Adolescent Research, 19,* 591-606. doi:10.1177/0743558403260007

Hawk, S. T., Becht, A., & Branje, S. (2016). Snooping as a distinct parental monitoring strategy: Comparisons with overt solicitation and control. *Journal of Adolescent Research.* Advance online publication. doi: 10.1111/jora.12204

Hawkins, J. D., Herrenkohl, T. I., Farrington, D. P., Brewer, D., Catalano, R. F., Harachi, T. W., & Cothern, L. (2000). *Predictors of youth violence.* (DOJ Publication No. NCJ-179065) Washington DC: Office of Juvenile Justice and Delinquency Prevention.

Hemovich, V., Lac, A., & Crano, W. D. (2011). Understanding early-onset drug and alcohol outcomes among youth: The role of family structure, social factors, and interpersonal perceptions of use. *Psychology, Health & Medicine, 16,* 249-267. doi:10.1080/13548506.2010.532560

Heron, M. (2015). Deaths: Leading causes for 2012. *National Vital Statistics Reports, 64,* 1-93. Retrieved from http://www.cdc.gov/nchs/data/nvsr/nvsr64/nvsr64_10.pdf

Hoeve, M., Dubas, J. S., Eichelsheim, V. I., van der Laan, P. H., Smeenk, W., & Gerris, J. R. M. (2009). The relationship between parenting and delinquency: A meta-analysis. *Journal of Abnormal Child Psychology, 37,* 749-775. doi: 10.1007/s108002-009-9310-8

Huang, D. Y. C, Murphy, D. A., & Hser, Y-I. (2011). Parental monitoring during early adolescence deters adolescent sexual initiation: Discrete-time survival mixture analysis. *Journal of Child and Family Studies, 20,* 511-520. doi:10.1007/s10826-010-9418-z

Huizinga, D., & Elliot, D. S. (1986). Reassessing the reliability and validity of self-report delinquency measures. *Journal of Quantitative Criminology, 2*, 293-327. doi: 10.1007/BF01064258

Institute of Medicine (IOM) & National Research Council (NRC) (2011). *The Science of Adolescent Risk-Taking: Workshop Report*. Washington, DC: National Academies Press Committee on the Science of Adolescence

Jacob, B. A., & Lefgren, L. (2003). Are idle hands the devil's workshop? Incapacitation, concentration and juvenile crime. *American Economic Review,* 1560-1577. doi: 10.3386/w9653

Jacobson, K. C., & Crockett, L. J. (2000). Parental monitoring and adolescent adjustment: An ecological perspective. *Journal of Research on Adolescence, 10*, 65-97. doi: 10.1207/SJRA1001_4

Jacobus, J., Squeglia, L. M., Meruelo, A. D., Castro, N., Brumback, T., Giedd, J. N. & Tapert, S. F. (2015). Cortical thickness in adolescent marijuana and alcohol users: A three-year prospective study from adolescence to young adulthood. *Developmental Cognitive Neuroscience, 16*, 101-109. doi: 10.1016/j.dcn.2015.04.006

Jelicic, H., Bobek, D. L., Phelps, E., Lerner, R. M., & Lerner, J. V. (2006). Using positive youth development to predict contribution and risk behaviors in early adolescence: Findings from the first two waves of the 4-H Study of Positive Youth Development. *International Journal of Behavioral Development, 31*, 263-273. doi: 10.1177/0165025407076439

Johnston, L. D., O'Malley, P. M., Miech, R. A., Bachman, J. G., & Schulenberg, J. E. (2016). Monitoring the Future national survey results on drug use, *1975*-2015*:* Overview, key *f*indings on adolescent drug use. Ann Arbor: Institute for Social Research, The University of Michigan.

Jones, J. D., Ehrlich, K. B.. Lejuez, C. W., & Cassidy, J. (2015). Parental knowledge of adolescent activities: Links with parental attachment style and adolescent substance use. *Journal of Family Psychology, 29(2),* 191-200. doi: 10.1037/fam0000070

Jöreskog, K. & Sörbom, D. (2001) LISREL 8: User's reference guide. Lincolnwood, IL: Scientific Software International, Inc.

Kaminski, J. A., & Sloutsky, V. M. (2012). Representation and transfer of abstract mathematical concept in adolescence and young adulthood. In V. F. Reyna, S. B. Chapman, M. R. Dougherty, & J. Confrey (Eds.). *The adolescent brain: Learning, reasoning, and decision making.* (pp. 67-93). Washington, DC: American Psychological Association.

Keijsers, L., Branje, S. J. T., VanderValk, I. E., & Meeus, W. (2010). Reciprocal effects between parental solicitation, parental control, adolescent disclosure, and adolescent delinquency.

Journal of Research on Adolescence, 20, 88-113. doi: 10.1111/j.1532-7795.2009.00631.x

Keijsers, L., Branje, S., Hawk, S. T., Schwartz, S. J., Frijns, T., Koot, H.M. ... & Meeus, W. (2012). Forbidden friends as forbidden fruit: Parental supervision of friendships, contact with deviant peers, and adolescent delinquency. *Child Development, 83,* 651-666. doi: 10.1111/j.1467-8624.2011.01701.x

Kelley, A. E., Schochet, T., & Landry, C. F. (2004). Risk taking and novelty seeking in adolescence: Introduction to Part 1. *Annuals of the New York Academy of Sciences, 1021,* 27-32. doi: 10.1196/annals.1308.003

Kerr, M., & Stattin, H. (2000a). Parental monitoring: A reinterpretation. *Child Development, 71,* 1072-1085. doi: 10.1111/1467-8624.00210

Kerr, M., & Stattin, H. (2000b). What parents know, how they know it, and several forms of adolescent adjustment: Further support for a reinterpretation of monitoring. *Developmental Psychology, 36,* 366-380. doi: 10.1037/0012-1649.36.3.366

Kerr, D. C. R., Capaldi, D. M., Pears, K. C. & Owen, L. D. (2012). Intergenerational influences on early alcohol use: Independence from the problem behavior pathway. *Development and Psychopathology, 24,* 889-906. doi:10.1017/S0954579412000430

Kerr, M., Stattin, H., & Burk, W. J. (2010). A reinterpretation of parental monitoring in longitudinal perspective. *Journal of Research on Adolescence, 20,* 39-64. doi: 10.1111/j.1532-7795.2009.00623.x

Kerr, D. C. R.; Tiberio, S. S., & Capaldi, D. M. (2015). Contextual risks linking parents' adolescent marijuana use to offspring onset. *Drug and Alcohol Dependence, 154,* 222-228. doi: 10.1016/j.drugalcdep.2015.06.041

Khurana, A., Romer, D., Betancourt, L. M., Brodsky, N. L., Giannetta, J. M., & Hurt, H. (2015). Stronger working memory reduces sexual risk taking in adolescents, even after controlling for parental influences. *Child Development, 86,* 1125-1141. doi:10.1111/cdev.12383

Kids Count Data Book (2017). State trends in child well-being. Retrieved from: http://www.aecf.org/m/resourcedoc/aecf-2017kidscountdatabook.pdf

Kim, J. E., Hetherington, E. M., & Reiss, D. (1999). Associations among family relationships, antisocial peers, and adolescents' externalizing behaviors: Gender and family type differences. *Child Development, 70,* 1209-1230. doi: 10.1111/1467-8624.00088

Knifsend, C.A. & Graham, S. (2012). Too much of a good thing? How breadth of extracurricular participation relates to school-related affect and academic outcomes

during adolescence. *Journal of Youth Adolescence, 41*, 379-389. doi: 10.1007/s10964-011-9737-4

Kristjansson, A. L., James, J. E., Allegrante, J. P., Sigfusdottir, I. D., & Helgason, A. R. (2010). Adolescent substance use, parental monitoring, and leisure-time activities: 12-year outcomes of primary prevention in Iceland. *Prevention Medicine, 51*, 168-171. doi: 10.1016/j.ypmed.2010.05.001

Kwan, M., Bobko, S., Faulkner, G., Donnelley, P., & Cairney, J. (2017). Sport participation and alcohol and illicit drug use in adolescents and young adults: A systematic review of longitudinal studies. *Addictive Behaviors, 39,* 497-506. doi: 10.1016/j.addbeh.2013.11.006

Lahey, B. B., Van Hulle, C. A., D'Onofrio, B. M., Rodgers, J. L., & Waldman, I. D. (2008). Is parental knowledge of their adolescent offspring's whereabouts and peer associations spuriously associated with offspring delinquency? *Journal of Abnormal Child Psychology, 36,* 807-823. doi:10.1007/s10802-008-9214-z

Laird, R. D., Marrero, M. M., & Sherwood, J. K. (2010). Developmental and interactional antecedents of monitoring in early adolescence. In V. Guilamo-Ramos, J. Jaccard & P. Dittus (pp. 39-66). Columbia University Press: New York

Laird, R. D., Pettit, G. S., Bates, J. E., & Dodge, K. A. (2003). Parents' monitoring-relevant knowledge and adolescents' delinquent behaviors: Evidence of correlated developmental changes and reciprocal influences. *Child Development, 74,* 752-768. doi: 10.1111/1467-8624.00566

Larson, R. W., & Richards, M. H. (1994). Family emotions: Do young adolescents and their parents experience the same states? *Journal of Research on Adolescence, 4,* 567-583. doi: 10.1207/s15327795jra0404_8

Larson, R. W., & Tran, S. P. (2014). Invited commentary: Positive youth development and human complexity. *Journal of Youth and Adolescence, 43,* 1012-1017. doi: 10.1007/s10964-014-0124-9

Lee, K. T. H. & Vandell, D. L. (2015). Out-of-school-time and adolescent substance use. *Journal of Adolescent Health, 57,* 523-529. doi: 10.1016/j.jadohealth.2015.07.003

Leeman, R. F., Patock-Peckham, J. A., Hoff, R. A., Krishnan-Sarin, S., Steinberg, M. A., Rugle, L. J., & Potenza, M. N. (2014). Perceived parental permissiveness toward gambling and risky behaviors in adolescents. *Journal of Behavioral Addictions, 3,* 115-123. doi: 10.1556/JBA.3.2014.012

Lempers, J. D., Clark-Lempers, D., & Simons, R. L. (1989). Economic hardship, parenting, and distress in adolescence. *Child Development, 60,* 25-39. doi: 10.2307/1131068

Lerner, R. M., & Galambos, N. L. (1998). Adolescent development: Challenges and opportunities for research, programs, and policies. *Annual Review of Psychology, 49,* 413-446. doi: 10.1146/annurev.psych.49.1.413

Lerner, R. M., Lerner, J. V., Almerigi, J. B., Theokas, C., Phelps, E., Gestsdottir, S., ... & Smith, L. M. (2005). Positive Youth Development, Participation in community youth development programs, and community contributions of fifth-grade adolescents findings from the first wave of the 4-H study of Positive Youth Development. *The Journal of Early Adolescence, 25,* 17-71. doi: 10.1177/0272431604272461

Lerner, R. M., Lerner, J. V., Bowers, E. P., & Geldhof, G. J. (2015). Positive youth development and relational-developmental systems. *Handbook of Child Psychology and Developmental Science, 1,* 1-45. doi: 10.1002/9781118963418.childpsy116

Light, J. M., Rusby, J. C., Nies, K. M., & Snijders, T. A. B. (2014). Antisocial behavior trajectories and social victimization within and between school years in early adolescence. *Journal of Research on Adolescence, 24,* 322-335. doi: 10.1111/jora.12055

Lippold, M. A., Fosco, G. M., Ram, N., & Feinberg, M. E. (2016). Knowledge lability: Within-person changes in parental knowledge and their associations with adolescent problem behavior. *Prevention Science, 17(2),* 274-283. doi: 10.1007/s11121-015-0604-5

Loeber, R. & Farrington, D. P. (2014). Age-crime curve. In G. Bruinsma & D. Weisburd (Eds). *Encyclopedia of Criminology and Criminal Justice* (pp. 12-18). New York: Springer. doi: 10.1007/978-1-4614-5690-2_474

Luciana, M., & Ewing, S. W. F. (2015). Introduction to the special issue: Substance use and the adolescent brain: Developmental impacts, interventions, and longitudinal outcomes. *Developmental Cognitive Neuroscience, 16,* 1-4. doi: 10.1016/j.dcn.2015.10.005

Mahoney, J. L., & Stattin, H. (2000). Leisure activities and adolescent antisocial behavior: The role of structure and social context. *Journal of Adolescence, 23,* 113-127. doi: 10.1006/jado.2000.0302

Mahoney, J. L., & Vest, A. E. (2012). The over-scheduling hypothesis revisited: Intensity of organized activity participation during adolescence and young adult outcomes. *Journal of Research on Adolescence, 22,* 409-418. doi: 10.1111/j.1532-7795.2012.00808.x

Mahoney, J. L. (2011). Adolescent Summer Care Arrangements and Risk for Obesity the Following School Year. *Journal of Adolescence, 34,* 737–749. doi: 10.1016/j.adolescence.2010.08.010

Mahoney, J. L., Harris, A. L., & Eccles, J. S. (2006). Organized activity participation, positive youth development and the over-scheduling hypothesis. *Social Policy Report, 20,* 1-32. Retrieved from http://files.eric.ed.gov/fulltext/ED521752.pdf

Mahoney, J. L., Larson, R. W., Eccles, J. S., & Lord, H. (2005). Organized activities as developmental contexts for children and adolescents. In J. L. Mahoney, R. W. Larson, & J. S. Eccles (Eds.) *Organized activities as contexts of development* ((pp.3-22). Mahway, NJ: Lawrence Erlbaum Associates

Mahoney, J. L., Lord, H., & Carryl, E. (2005). An ecological analysis of after-school program participation and the development of academic performance and motivational attributes for disadvantaged children. *Child Development, 76,* 811-825. doi: 10.1111/j.1467-8624.2005.00879.x

Mahoney, J. L., Stattin, H., & Lord, H. (2004). Unstructured youth recreation centre participation and antisocial behaviour development: Selection influences and the moderating role of antisocial peers. *International Journal of Behavioral Development, 28,* 553-560. doi: 10.1080/01650250444000270

Makarios, M., Cullen, F. T., & Piquero, A. R. (2015). Adolescent criminal behavior, population heterogeneity, and cumulative disadvantage: Untangling the relationship between adolescent delinquency and negative outcomes in emerging adulthood. *Crime & Delinquency*. Advance online publication. doi: 10.1177/001128715572094

Maloney, P. W., Grawitch, M. J., & Barber, L. K. (2012). The multi-factor structure of the Brief Self-Control Scale: Discriminant validity of restraint and impulsivity. *Journal of Research in Personality, 46,* 111-115. doi: 10.1016/j.jrp.2011.10.001

Marotta, P. L., & Voisin, D. R. (2017). Testing three pathways to substance use and delinquency among low-income African American adolescents. *Child and Youth Services Review, 75,* 7-14. doi: 10.1016/j.childyouth.2017.02.009

Marsh, H., & Kleitman, S. (2002). Extracurricular school activities: The good, the bad, and the nonlinear. *Harvard Educational Review, 72,* 464-515. doi: 10.17763/haer.72.4.051388703v7v7736

Maslowsky, J., Schulenberg, J. E., & Zucker, R. A. (2014). Influence of conduct problems and depressive symptomatology on adolescent substance use: Developmentally proximal versus distal effects. *Developmental Psychology, 50,* 1179-1189. doi: 10.1037/a0035085

Mason, W. A., & Spoth, R. L. (2012). Sequence of alcohol involvement from early onset to young adult alcohol abuse: Differential predictors and moderation by family-focused preventive intervention. *Addiction, 107,* 2137-2148. doi:10.1111/j.1360-0443.2012.03987.x

Mazza, J. R. S., Lambert, J., Zunzunegui, M. V., Tremblay, R. E., Boivin, M., & Côté, S. M. (2017). Early adolescence behavior problems and timing of poverty during childhood: A comparison of lifecourse models. *Social Science & Medicine, 177*, 35-42. doi: 10.1016/j.socscimed.2017.01.039

McCombs, J. S., Augustine, C. H., Schwartz, H. L., Bodilly, S. J., McInnis, B., Lichter, D. S. & Cross, A. B. (2011). *Making summer count: How summer programs can boost children's learning*. (Report Number: MG-1120). Rand Corporation.

McCord, J. (1992). The Cambridge-Somerville Study: A pioneering longitudinal experimental study of delinquency prevention. In J. McCord & R. Ernest (Eds.). *Preventing antisocial behavior: Interventions from birth through adolescence* (pp. 196-206). New York, NY: Guilford Press

Meier, M.H., Hill, M. L., Small, P. J., & Luthar, S. S. (2015). Associations of adolescent cannabis use with academic performance and mental health: A longitudinal study of upper middle class youth. *Drug and Alcohol Dependence, 156,* 207-212. doi: 10.1016/j.drugalcdep.2015.09.010

Mercer, N., Keijsers, L., Crocetti, E., Branje, S., & Meeus, W. (2016). Adolescent abstention from delinquency: Examining the mediating role of time spent with (delinquent) peers. *Journal of Research on Adolescence.* Advance online publication. doi: 10.1111/jora.12246

Mirman, J. H., Albert, D., Jacobsohn, L. S., & Winston, F. K. (2012). Factors associated with adolescents' propensity to drive with multiple passengers and to engage in risky driving behaviors. *Journal of Adolescent Health, 50*, 634-640. doi:10.1016/j.jadohealth.2011.10.256

Moffitt, T. E. (1993). Adolescence-limited and life-course-persistent antisocial behavior: A developmental taxonomy. *Psychological Review, 100,* 674-701. doi: 10.1037/0033-295X.100.4.674

Moffitt, T. E., Caspi, A., Harrington, H., & Milne, B. J. (2002). Males on the life-course-persistent and adolescent-limited antisocial pathways: Follow-up at age 26 years. *Development and Psychopathology, 14,* 179-207. doi: 10.1017/S0954579402001104

Monahan, K. C., Rhew, I. C., Hawkins, J. D., & Brown, E. C. (2013). Adolescent pathways to co-occurring problem behavior: The effects of peer delinquency and peer substance use. *Journal of Research on Adolescence, 24,* 630-645. doi: 10.1111/jora.12053

Monahan, K. C., Steinberg, L., & Cauffman, E. (2009). Affiliation with antisocial peers, susceptibility to peer influence, and antisocial behavior during the transition to adulthood. *Developmental Psychology, 45,*1520-1530. doi: 10.1037/a0017417

Moss, H. B., Chen, C. M., & Yi, H. (2014). Early adolescent patterns of alcohol, cigarettes, and marijuana polysubstanc use and young adult substance use outcomes in a nationally representative sample. *Drug and Alcohol Dependence, 136,* 51-62. doi: 10.1016/jdrugalcdep.2013.12.011

Neumann, A., Barker, E. D., Koot, H. M., & Maughan, B. (2010). The role of contextual risk, impulsivity, and parental knowledge in the development of adolescent antisocial behavior. *Journal of Abnormal Psychology, 119,* 534-545. doi:10.1037/a0019860

Nigg, J. T. (2107). Annual research review: On the relations among self-regulation, self-control, executive functioning, effortful control, cognitive control, impulsivity, risk-taking, and inhibition for developmental psychopathology. *Journal of Child Psychology and Psychiatry, 58,* 361-383. doi: 10.1111/jcpp.12675

Nguyen-Louie, T. T., Castro, N., Matt, G. E., Squeglia, L. M., Brumback, T., & Tapert, S. F. (2015). Effects of emerging alcohol and marijuana use behaviors on adolescents' neuropsychological functioning over four years. *Journal of Studies on Alcohol and Drugs, 76(5),* 738-748. doi: 10.15288/jsad.2015.76.738

O'Connor, R. M & Colder, C. R. (2015). The prospective joint effects of self-regulation and impulsive processes on early adolescence alcohol use. J*ournal of Studies on Alcohol and Drugs, 76, 884*-894. doi: 10.15288/jsad.2015.76.884

Office of Juvenile Justice and Delinquency Prevention (2014). *Juvenile arrests 2012.* (National Report Series No. NCJ 248513). Retrieved from http://www.ojjdp.gov/pubs/248513.pdf

Osgood, D. W., Anderson, A., & Shaffer, J. N. (2010). Unstructured leisure in the after-school hours. In J. L. Mahoney, R. W. Larson, & J. S. Eccles (Eds.), *Organized activities as contexts of development* (pp. 45-64). Mahway, NJ: Lawrence Erlbaum Associates.

Osgood, D. W., Feinberg, M. E., & Ragan, D. T. (2015). Social networks and the diffusion of adolescent problem behavior: Reliable estimates of selection and influence from sixth through ninth grades. *Prevention Science, 16,* 832-843. doi: 10.1007/s11121-015-0558-7

Osgood, D. W., Ragan, D. T., Wallace, L., Gest, S. D., Feinberg, M. E., & Moody, J. (2013). Peers and the Emergence of Alcohol Use: Influence and Selection Processes in Adolescent Friendship Networks. *Journal of Research on Adolescence, 23,* doi: 10.1111/jora.12059.

Osgood, D. W., Wilson, J. K., O'Malley, P. M., Bachman, J. G., & Johnston, L. D. (1996). Routine activities and individual deviant behavior. *American Sociological Review, 61,* 635-655. doi: 10.2307/2096397

Padilla-Walker, L. M., Carlo, G., Christensen, K. J., & Yorgason, J. B. (2012). Bidirectional relations between authoritative parenting and adolescents' prosocial behaviors. *Journal of Research on Adolescence, 22,* 400-408. doi: 10.1111/j.1532-7795.2012.00807.x

Pardini, D. A., Loeber, R., & Stouthamer-Loeber, M. (2005). Developmental shifts in parent and peer influences on boys' beliefs about delinquent behavior. *Journal of Research on Adolescence, 15,* 299-323. doi: 10.1111/j.1532-7795.2005.00098.x

Parente, M. E., Sheppard, A., & Mahoney, J. L. (2012). Parental knowledge as a mediator of the relation between adolescent summer care arrangement configurations and adjustment the following school year. *Applied Developmental Science, 16,* 84-97. doi: 10.1080/1088691.2012.668341

Parker, J. S., & Benson, M. J. (2004). Parent-adolescent relations and adolescent functioning: Self-esteem, substance abuse, and delinquency. *Adolescence, 39,* 519-530. Retrieved from http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=psyc4&NEWS=N&AN=2004-22478-008.

Patterson, G. R., & Stouthamer-Loeber, M. (1984). The correlation of family management practices and delinquency. *Child Development, 55,* 1299-1307. doi: 10.2307/1129999

Pedersen, S., & Seidman, E. (2005). Contexts and correlates of out-of-school participation among low-income urban adolescents. In J. L. Mahoney, R. W. Larson, & J. S. Eccles (Eds.), *Organized activities as contexts of development* (pp. 85-109). Mahway, NJ: Lawrence Erlbaum Associates.

Persson, A., Kerr, M., & Stattin, H. (2007). Staying in or moving away from structured activities: Explanations involving parents and peers. *Developmental Psychology, 43,* 197-207. doi: 10.1037/0012-1649.43.1.197

Pettit, G. S., Bates, J. E., Dodge, K. A., & Meece, D. W. (1999). The impact of after-school peer contact on early adolescent externalizing problems is moderated by parental monitoring, perceived neighborhood safety, and prior adjustment. *Child Development, 70,* 768-778. doi: 10.1111/1467-8624.00055

Posner, J. K., & Vandell, D. L. (1999). After-school activities and the development of low-income urban children: a longitudinal study. *Developmental Psychology, 35,* 868-879.

Preacher, K. J., & Coffman, D. L. (2006). *Computing power and minimum sample size for RMSEA. (Computer software).* Available from http://quantpsy.org.

Price, J., Wight, V. R., Hunt, B. R., & Bianchi, S. M. (2010). The time use of teenagers. *Social Science Research, 38,* 792-809. doi: 10.1016/j.ssresearch.2009.05009

Rai, A. A., Stanton, B., Wu, Y., Li, X., Galbraith, J., Cottrell, L., ... & Burns, J. (2003). Relative influences of perceived parental monitoring and perceived peer involvement on adolescent risk behaviors: An analysis of six cross-sectional data sets. *Journal of Adolescent Health, 33,* 108-118. doi:10.1016/S1054-139X%2803%2900179-4

Racz, S. J., & McMahon, R. J. (2011). The relationship between parental knowledge and monitoring and child and adolescent conduct problems: A 10-year update. Clinical Child and Family Psychology Review, 14, 377-398. doi: 10.1007/s10567-011-0099-y

Randall, E. T., & Bohnert, A. M. (2009). Organized activity involvement, depressive symptoms, and social adjustment in adolescents: Ethnicity and socioeconomic status as moderators. Journal of Youth and Adolescence, 38, 1187-1198. doi: 10.1007/s10964-009-9417-9

Ramey, H. L., & Rose-Krasnor, L. (2012). Contexts of structured youth activities and positive youth development. *Child Development Perspectives, 6, 85*-91. doi: 10.1111/j.1750-8606.2011.00219.x

Reiss, A. J. (1975). Inappropriate theories and inadequate methods as policy plagues: Self-reported delinquency and the law. In N. J. Demerath, O. Larsen, & K. F. Schuessler. *Social Policy and Sociology* (pp. 211-222) New York, NY: Academic Press, Inc.

Reyna, V. F., Chapman, S. B., Dougherty, M. R., & Confrey, J. (2012). *The Adolescent Brain: Learning, Reasoning, and Decision Making.* Washington, D.C.: American Psychological Association

Richards, M. H., Miller, B. V., O'Donnell, P. C., Wasserman, M. S., & Colder, C. (2004). Parental monitoring mediates the effect of age and sex on problem behaviors among African American urban young adolescents. *Journal of Youth and Adolescence, 33,* 221-233. doi: 10.1023/B:JOYO.0000025321.27416.f6

Richardson, J. L., Radziszwska, B., Dent, C. W., & Flay, B. R. (1993). Relationship between after-school care of adolescents and substance use, risk taking, depressed mood, and academic achievement. *Pediatrics, 92,* 32-38.

Roenneberg, T., Kuehnle, T., Pramstaller, P. P., Ricken, J., Havel M., Guth, A., & Merrow, M. (2004). A marker for the end of adolescence. *Current Biology, 14,* 1038-1039. doi: 10.1016/j.cub.2004.11.039

Rose-Krasnor, L., Busseri, M. A., Willoughby, T., & Chalmers, H. (2006). Breadth and intensity of youth activity involvement as context for positive development. *Journal of Youth and Adolescence, 35,* 365-379. doi: 10.1007/s10964-006-9037-6

Rote, W. M., & Smetana, J. G. (2016). Beliefs about parents' right to know: Domain differences and associations with change in concealment. *Journal of Research on Adolescence, 26,* 334-344. doi: 10.1111/jora.12194

Rote, W. M., Smetana, J. G., Campione-Barr, N., Villalobos, M., & Tasopoulos-Chan, M. (2012). Associations between observed mother-adolescent interactions and adolescent information management. *Journal of Research on Adolescence, 22,* 206-214. doi: 10.1111/j.1532-7795.2011.00776.x

Roth, J. L., Malone, L. M., & Brooks-Gunn, J. (2010). Does the amount of participation in afterschool programs relate to developmental outcomes? A review of the literature. *American Journal of Community Psychology, 45,* 310-324. doi: 10.1007/s104464-010-9303-3.

Roth, J., Brooks-Gunn, J., Murray, L., Foster, W. (1998). Promoting healthy adolescents: Synthesis of youth development program evaluations. *Journal of Research on Adolescence, 8,* 423-459. doi: 10.1207/s15327795jra0804_2

Ryan, L. G., Miller-Loessi, K., & Nieri, T. (2007). Relationships with adults as predictors of substance use, gang involvement, and threats to safety among disadvantaged Urban high-school adolescents. *Journal of Community Psychology, 35,* 1053-1071. doi:10.1002/jcop.20211

Sapienza, J. K. & Masten, A. (2011). Understanding and promoting resilience in children and youth. *Current Opinion in Psychiatry. 24(4).* 267-273. doi: 10.1097/YCO.0b013e32834776a8

Sartor, C. E., & Youniss, J. (2002). The relationship between positive parental involvement and identity achievement during adolescence. *Adolescence, 37,* 221-234.

Scales, P. C., Benson, P. L., Leffert, N., & Blyth, D. A. (2000). Contribution of developmental assets to the prediction of thriving among adolescents. *Applied Developmental Science, 4,* 27-46. doi: 10.1207/S1532480XADS0401_3

Schweinsburg, A. D., Brown, S. A., & Tapert, S. F. (2008). The Influence of Marijuana Use on Neurocognitive Functioning in Adolescents. *Current Drug Abuse Reviews, 1,* 99–111. doi: 10.2174/1874473710801010099#sthash.FE3osDf6.dpuf

Schwinn, T. M. & Schinke, Steven P. (2014). Alcohol use and related behaviors among late-adolescent urban youths: Peer and parent influences. *Journal of Child & Adolescent Substance Abuse, 23,* 58-64. doi: 10.1080/1067828X.2012.735561

Sheppard, M. A., Snowden, C. B., Baker, S. P., & Jones, P. R. (2008). Estimating alcohol and drug involvement in hospitalized adolescents with assault injuries. *Journal of Adolescent Health, 43,* 165-171. doi: 10.1016/j.j.adohealth.2007.12.016

Simpkins, S., Little, P., & Weiss, H. (2004). *Understanding and measuring attendance in out-of-school time programs*. Cambridge, MA: Harvard Family Research Project.

Simons-Morton, B., Haynie, D. L., Crump, A. D., Eitel, P., & Saylor, K. E. (2001). Peer and parent influences on smoking and drinking among early adolescents. *Health Education & Behavior, 28,* 95-107. doi: 10.1177/109019810102800109

Siqueira, L., Smith, V. C., & Committee on Substance Abuse (2015). Binge drinking. *Pediatrics, 136,* e718-e726. doi: 10.1542/peds.2015-2337

Sitnick, S. L., Brennan, L. M., Forbes, E., & Shaw, D. S. (2014). Developmental pathways to sexual risk behavior in high-risk adolescent boys. *Pediatrics, 133,* 1038-1045. doi:10.1542/peds.2013-3976

Smetana, J. G., & Daddis, C. (2002). Domain-specific antecedents of parental psychological control and monitoring: The role of parenting belief and practices. *Child Development, 73,* 563-580. doi: 10.1111/1467-8624.00424

Smetana, J. G. (1988). Adolescents' and parents' conceptions of parental authority. *Child Development, 59,* 321-335. doi: 10.2307/1130313

Smetana, J. G. (2008). "It's 10 O'Clock: Do you know where your children are?" Recent advances in understanding parental monitoring and adolescents' information management. *Child Development Perspectives, 2,* 19-25. doi: 10.1111/j.1750-8606.2008.00036.x

Smith, A. R., Chein, J., & Steinberg, L. (2014). Peers increase adolescent risk taking even when the probabilities of negative outcomes are known. *Developmental Psychology, 50,* 1564-1568. doi:10.1037/a0035696

Soenens, B., Vansteenkiste, M., Luyckx, K., & Goossens, L. (2006). Parenting and adolescent problem behavior: An integrated model with adolescent self-disclosure and perceived parental knowledge as intervening variables. *Developmental Psychology, 42,* 305-318. doi: 10.1037/0012-1649.42.2.305

Spear, L. P. (2000). Neurobehavioral changes in adolescence. *Current Directions in Psychological Science, 9 (4),* 111-114. doi: 10.1111/1467-8721.00072

Spear, L. P. (2011). Adolescent neurobehavioral characteristics, alcohol sensitivities, and intake: Setting the stage for alcohol use disorders? *Child Development Perspectives, 5(4),* 231-238. doi: 10.1111/j.1750-8606.2011.00182.x

Squeglia, L. M., Jacobus, J., & Tapert, S. F. (2009). The influence of substance use on adolescent brain development. *Clinical EEG and Neuroscience, 40(1),* 31-38. doi: 10.1177/155005940904000110

Stanton, B. F., Li, X., Galbraith, J., Cornick, G., Feigelman, S., Kaljee, L., & Zou, Y. (2000). Parental underestimates of adolescent risk behavior: A randomized, controlled trial of a

parental monitoring intervention. *Journal of Adolescent Health, 26,* 18-26. doi: 10.1016/S1054-139X(99)00022-1

Stautz, K., & Cooper, A. (2013). Impulsivity-related personality traits and adolescent alcohol use: a meta-analytic review. *Clinical Psychology Review, 33,* 574-592. doi: 10.1016/j.cpr.2013.03.003

Steinberg, L. (2008). A social neuroscience perspective on adolescent risk-taking. *Developmental Review, 28,* 76-108. doi: 10.1016/j.dr.2007.08.002

Steinberg, L. (2010). A dual systems model of adolescent risk-taking. *Developmental Psychobiology, 52,* 216-224. doi: 10.1002/dev.20445

Stice, E., & Barrera, M. (1995). A longitudinal examination of the reciprocal relations between perceived parenting and adolescents' substance use and externalizing behaviors. *Developmental Psychology, 31,* 322-334. doi: 10.1037/0012-1649.31.2.322

Tearne, J. E. (2015). Older maternal age and child behavioral and cognitive outcomes: A review of the literature. *Fertility and Sterility, 103,* 1381-1391. doi: 10.1016/j.fertnstert.2015.04.027

Tice, D. M., & Bratslavsky, E. (2000). Giving in to feel good: The place of emotion regulation in the context of general self-control. *Psychological Inquiry, 11,* 149-159. doi: 10.1207/S15327965PLI1103_03

Tilton-Weaver, L. C., Burk, W. J., Kerr, M., & Stattin, H. (2013). Can parental monitoring and peer management reduce the selection or influence of delinquent peers? Testing the question using a dynamic social network approach. *Developmental Psychology, 49,* 2057-2070. doi: 10.1037/a0031854

Tilton-Weaver, L. C., Kerr, M., Pakalniskeine, V., Tokic, A., Salihovic, S., & Stattin, H. (2010). Open up or close down: How do parental reactions affect youth information management? *Journal of Adolescence, 33,* 333-346. doi: 10.1016/j.adolescence.2009.07.111

Trucco, E. M., Colder, C. R., & Wieczorek, W. F. (2011). Vulnerability to peer influence: A moderated mediation study of early adolescent alcohol use initiation. *Addictive Behaviors, 36,* 729-736. doi:10.1016/j.addbeh.2011.02.008

Vandell, D. L., Larson, R. W., Mahoney, J. L., & Watts, T. W. (2015). Children's organized activities. In R. M. Lerner (Ed.) *Handbook of child psychology and developmental science, Vol. 4*. Wiley

Vaughn, M. G., Nelson, E. J., Salas-Wright, C. P., Qian, Z., & Schootman, M. (2016). Racial and ethnic trends and correlates of non-medical use of prescription opioids among

adolescents in the United States 2004-2013. *Journal of Psychiatric Research, 73,* 17-24. doi: 10.1016/j.psychires.2015.11.003

Voisin, D. R., Hotton, A. L., Tan, K., & DiClemente, R. (2013). A longitudinal examination of risk and protective factors associated with drug use and unsafe sex among young African American females. *Children and Youth Services Review, 35,* 1440-1446. doi:10.1016/j.childyouth.2013.05.019

Vries, S. L. A, Hoeve, M., Stams, G. J. J. M., & Asscher, J. J. (2015). Adolescent-parent attachment and externalizing behavior: The mediating role of individual and social factors. *Journal of Abnormal Child Psychology, 44(2),* 283-294. doi:10.1007/s10802-015-9999-5

Weichold, K., Wiesner, M. F., & Silbereisen, R. K. (2014). Childhood predictors and mid-adolescent correlates of developmental trajectories of alcohol use among male and female youth. *Journal of Youth and Adolescence, 43,* 698-716. doi:10.1007/s10964-013-0014-6

Willoughby, T., Chalmers, H., Busseri, M. A., Bosacki, S., Dupont, D., Marini, Z., ... Woloshyn, V. (2007). Adolescent non-involvement in multiple risk behaviors: An indicator of successful development? *Applied Developmental Science, 11,* 89-103. doi:10.1080/10888690701384954

Willoughby, T., & Hamza, C. A. (2011). A longitudinal examination of the bidirectional associations among perceived parenting behaviors, adolescent disclosure and problem behavior across the high school years. Journal of Youth and Adolescence, 40, 463-478. doi: 10.1007/s10964-010-9567-9

Wilson, S., Malone, S. M., Thomas, K. M., & Iacono, W. G. (2015). Adolescent drinking and brain morphometry: A co-twin control analysis. *Developmental Cognitive Neuroscience, 16,* 130-138. doi: 10.1016/j.dcn.2015.07.005

Wolf, S., Aber, J.L. & Morris, P.A. (2015). Patterns of time use among low-income urban minority adolescents and associations with academic outcomes and problem behaviors. *Journal of Youth and Adolescence, 44*, 1208-1125. doi: 10.1007/s10964-015-0294-0

Wood, M. D., Read, J. P., Mitchell, R. E., & Brand, N. H. (2004). Do parents still matter? Parent and peer influences on alcohol involvement among recent high school graduates. *Psychology of Addictive Behaviors, 18,* 19-30. doi: 10.1037/0893-16X.18.1.19

Wu, A. D., Li, Z., & Zumbo, B. D. (2007). Decoding the meaning of factorial invariance and updating the practice of multi-group confirmatory factor analysis: A demonstration with TIMSS data. *Practical Assessment, Research, & Evaluation, 12,* 1-26.

Yang, H., Stanton, B., Cottrel, L., Kaljee, L., Galbraith, J., Li, X., ... & Wu, Y. (2006). Parental awareness of adolescent risk involvement: Implications of overestimates and

underestimates. *Journal of Adolescent Health, 39,* 353-361. doi:10.1016/j.jadohealth.2005.12.008

Zehe, J. M., & Colder, C. R. (2014). A latent growth curve analysis of alcohol-use specific parenting and adolescent alcohol use. *Addictive Behaviors, 39,* 1701-1705. doi: 10.1016/j.addbeh.2014.05.003

Zeigler, D. W., Wang, C. C., Yoast, R. A., Dickinson, B. D., McCaffree, M. A. .... Sterling, M. L. (2005). The neurocognitive effects of alcohol on adolescents and college students. *Preventive Medicine, 40(1),* 23-32. doi:10.1016/j.ypmed.2004.04.044

Zimmerman, M. A., Salem, D. A., & Maton, K. I. (1995). Family structure and psychosocial correlates among urban African-American adolescent males. *Child Development, 66,* 1598-1613. doi: 10.1111/j.1467-8624.1995.tb00954.

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