

## ABSTRACT

Title: UNDERSTANDING THE MECHANISMS  
RESPONSIBLE FOR THE POSITIVE IMPACT  
OF AFTER-SCHOOL PROGRAMS

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After-school programs have gained considerable attention for their potential to reduce delinquency after school. The current study assessed the factors related to effective after-school programming utilizing survey data from a recent evaluation of after-school programs. Program participation was responsible for reducing property, violent, and general offending, but not substance use. Further analysis concluded that the hypothesized increase in parental supervision, increase in positive peer influence, and reduction in unsupervised time were insufficient to explain the ability of after-school programs to elicit behavioral improvements. After-school programs were also found to be equally effective for youth from high and low income families.

UNDERSTANDING THE MECHANISMS RESPONSIBLE FOR THE POSITIVE  
IMPACT OF AFTER-SCHOOL PROGRAMS

By

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# CHAPTER 1: INTRODUCTION

Considering the high proportion of juvenile crime occurring during the few hours following school closure (Soulé, 2003; Snyder, Sickmund, & Poe-Yamagata, 1996; Sickmund, Snyder, & Poe-Yamagata, 1997; Gottfredson, Gottfredson, & Weisman, 2001), after-school programs have been proposed as a strategy for reducing the opportunity for delinquency. In an evaluation of multiple after-school programs across the state of Maryland that received funding from the Maryland After School Opportunity Fund Program (MASOFP; Gottfredson, Soulé, & Cross, 2004a) grant, youth who attended MASOFP after-school programs demonstrated lower rates of delinquency after participation than did a matched sample of comparison youth, implying that after-school programs are effective in reducing delinquency in the after-school hours.

Determining the *mechanisms* responsible for the positive behavioral change, however, is important for developing effective after-school programs most capable of reducing delinquency. Past research on the correlates of delinquency has repeatedly found low parental monitoring (Patterson, 1993; Rankin & Kern, 1994; Flannery, Williams, & Vazsonyi, 1999; Kung & Farrell, 2000; Gottfredson, Gottfredson, & Weisman, 2001; Farrington et al., 2002), negative peer association (Simons & Robertson, 1989; Patterson, 1993; Flannery et al., 1999; Hawdon, 1999; Kung & Farrell, 2000; Wikstrom & Loeber, 2000; Farrington et al., 2002), and unsupervised time after school (Dishion et al., 1991; Galambos & Maggs, 1991; Yin, Katims, & Zapata, 1999) to significantly predict juvenile delinquent behavior. After-school

programs were proposed as a way to prevent delinquent behavior due to their potential for increasing parental awareness of their children's whereabouts after school, increasing youth association with prosocial peers and adults, and increasing the level of supervised time after release from school. Although *conceptually* after-school programs could influence each of these correlates of delinquency, the effectiveness of after-school programs in reducing delinquent propensity could depend largely on their ability to produce significant changes to the mediating mechanisms of parental monitoring, association with prosocial peers, and supervised time expenditure after school.

The current study tests which mediating variables facilitate improvements in behavior through participation in after-school programs. Utilizing the data from the MASOFP evaluation, this study measures the impact of changes in parental monitoring, positive peer association, and amount of unsupervised free time after school on subsequent behavioral improvements. The current analysis also assesses whether the effectiveness of after-school programs depends on their ability to induce changes in these mediating factors.

In addition to understanding which mechanisms mediate positive behavioral change, determining the population to which the mediating relationships can be generalized is important for predicting the types of youth who will benefit most from after-school program attendance. To illustrate, the original MASOFP evaluation reported that program attendance was more effective for low income youth in reducing delinquent behavior (particularly substance use) than for youth of higher income levels (Gottfredson, Soulé, & Cross, 2004a). The original study, however, did

not investigate why after school programs appeared to be more effective for low income youth. It could be the case, for example, that low income youth benefit more from increased supervision because they are more likely than their higher income peers to be unsupervised during the after school hours. The current investigation tests this and other possible explanations of the income-level variations in program effectiveness reported in the original MASOFP evaluation. Specific analyses are conducted to assess whether the proposed mediating pathways impact high and low income youth differently, or whether the apparent variation in after-school program effectiveness by income level can be explained by initial disproportionate levels of parental monitoring, amount of unsupervised free time, and/or association with positive peers.

Another important issue relevant to the current study is whether the influences of these potential mediating pathways and income level are consistent over different types of delinquency. Typically, studies of delinquency correlates fail to distinguish between various types of behaviors, combining them into a single measure of general delinquency. For those assessments in which multiple measures are utilized, substance use is generally distinguished from other delinquent behaviors. Still, researchers have rarely looked at more specific types of delinquency such as property and violent crimes. The little data available on the mediating mechanisms and various delinquency categories suggest that the impacts of parental monitoring, positive peer association, and unsupervised time expenditure are consistent across crimes types (e.g. Flannery, Williams, & Vazsonyi, 1999; Hawdon 1999; Osgood et al., 1996). Income level appears to be the only factor that varies by offense, demonstrating a

positive association with drug use (Hoffmann, 2000) and a negative association with other crime types (Stewart, 2003; Johnson et al., 1997; Johnson et al., 1995). After taking into account other mediating influences (i.e. parental monitoring), however, the seeming impact of income level on delinquency tends to disappear (Demuth & Brown, 2004; Sampson & Laub, 1994; Laub and Sampson, 1988). Further investigation into the relationships between the mediating pathways and delinquency of varying types would help explain whether different mechanisms drive the propensity to engage in varying types of antisocial behavior.

## **CHAPTER 2: REVIEW OF PREVIOUS RESEARCH**

### ***Juvenile Delinquency in the After-school Hours***

The after-school hours are of high public concern in regard to juvenile delinquency and victimization. This apprehension is supported by the evidence illustrating that the largest proportion of violent juvenile crime occurs in the hours immediately following school closure (2 p.m. to 6 p.m.), as demonstrated by both official (Snyder, Sickmund, & Poe-Yamagata, 1996; Sickmund, Snyder, & Poe-Yamagata, 1997) and self-report data (Gottfredson, Gottfredson, & Weisman, 2001). To illustrate, data from the National Incident-based Reporting System from 1991 to 1996 showed that approximately 20 percent of crimes were committed during the five-hour period (2 p.m. to 7 p.m.) following release from school. The indication that over half (57%) of juvenile crime is committed on school days further increases fear of crime after school (Office of Juvenile Justice and Delinquency Prevention, 1999).

Substance use is also problematic during the after-school hours. Although the incidence of substance use may be higher on the weekends, as illustrated in a self-report assessment of secondary school students (Soulé, 2003), when considering incidents per hour, substance abuse is proportionally greater during the hours following release from school. The high rates of juvenile delinquency and substance use during this short time span have caused speculation regarding adolescent activities and supervision during the after-school hours.

## ***Parental Supervision***

Investigation into the problem of juvenile delinquency in the after-school hours has often revealed the lack of parental supervision and monitoring (defined as parents' physical supervision and well as parents' awareness of their child's free time activities, peer associations, and whereabouts when away from home) to be important mediating factors in the production of antisocial behaviors. The U.S. Departments of Education and Justice (2000) discovered that over two-thirds (69%) of married couples with children ages 6 to 17 had both parents working away from home. Out of all the single-parent households, the custodial parent was found to work in 71 percent of single-mothers families and in 85 percent of single-father families. With working parents, children were left without parental supervision for as many as 20 to 25 hours per week.

Evidence linking the lack of parental supervision and monitoring with elevated behavioral and emotional problems has repeatedly highlighted the dangers of youth left unattended, particularly in the after-school hours. Numerous studies have demonstrated a link between low parental monitoring and increased levels of delinquency and substance use (Patterson, 1993; Rankin & Kern, 1994; Flannery, Williams, & Vazsonyi, 1999; Kung & Farrell, 2000; Gottfredson, Gottfredson, & Weisman, 2001; Farrington et al., 2002). For example, Flannery, Williams, and Vazsonyi (1999) conducted a correlational survey of 1,170 sixth and seventh grade youth designed to assess the relationships among after-school time use, parental monitoring, and problem behaviors. Their results indicated that youth reports of low

parental monitoring were significantly associated with aggressive and delinquent behavior, including substance use.

To expand upon the correlational relationship found in prior studies, Farrington and colleagues (2002) utilized longitudinal data of 506 boys from the Pittsburgh Youth Study to better assess the causal impact of low supervision on delinquency. Conducting forward-lagged within-individual correlations, the authors found that poor parental supervision and low parental reinforcement were the two most important predictors of delinquency in the model, more so than low socioeconomic status, hyperactivity, depressed mood, and even peer delinquency. Corresponding research in the area (e.g. Sampson & Laub, 1994; Laub and Sampson, 1988) has come to similar conclusions regarding parental supervision, stressing the importance of parental monitoring on later juvenile delinquent activity.

The importance of parental supervision does not pertain exclusively to direct physical supervision. Indirect supervision through parental knowledge of their children's whereabouts, friends, and activities while away from home also protects youth from the pressures to act delinquent. Steinberg (1986), for example, found that youth whose parents indirectly monitor their behavior were less likely to succumb to negative peer influences, even if they were not under direct adult supervision. Such results demonstrate how both direct and indirect parental supervision are more effective than inconsistent or no supervision in preventing youth from engaging in delinquent behaviors (Gottfredson, Gottfredson, & Weisman, 2001).

The protective effect of parental monitoring appears to hold across various types of behavior, including general delinquency and substance use. More difficult to determine is the specific impact of parental monitoring on property versus violent crimes, since most research combines both types into one measure of delinquency. The few studies that did look at varying types of delinquent acts generally agreed that the relationship between parental monitoring and behavior emerged regardless of the particular measure of delinquency. Jones and colleagues (2001), to illustrate, compared youthful offenders by level of severity and discovered that self-reported levels of parental monitoring did not distinguish between chronic (mixed property and violent crimes) and non-chronic (primarily property crimes only) juvenile delinquents.

Slight differences in the association of monitoring and delinquency by crime type were reported by Demuth and Brown (2004). Using data from the 1995 National Longitudinal Survey of Youth, the researchers did find variation in the impact of parental monitoring, concluding that supervision and monitoring decreased both petty and serious property crimes, but these significant effects were not demonstrated for violent crimes. Despite this example of variation by crime type, the consistent demonstration of the influential effect of parental monitoring on general delinquency suggests that further investigation will confirm that the relationship between parental supervision and behavior holds across all types of delinquency.

### ***Negative Peer Influence***

Associating with deviant peers is considered to be one of the biggest predictors of juvenile delinquency (Wikstrom & Loeber, 2000; Farrington et al.,



2002). This link between antisocial peers and delinquency of all types has been repeatedly found using cross-sectional as well as longitudinal data. In regard to general delinquency, Patterson (1993), for example, used latent growth modeling on data collected from grades four to ten for a sample of 206 youth participating in the Oregon Youth Study to demonstrate that commitment to a delinquent peer group in early adolescence was uniquely associated with growth in delinquency. Deviant peer association has shown to be significantly predictive of general delinquency (Patterson, 1993; Flannery et al., 1999), substance use (Simons & Robertson, 1989; Flannery et al., 1999; Hawdon, 1999; Kung & Farrell, 2000) and late-onset offending (Patterson, 1993). Further investigation into the issue of peers and delinquency has consistently illustrated the important developmental impact of peer groups on youth behavior. This relationship is especially problematic when considering that association with antisocial peers is relatively stable across adolescence (Dishion et al., 1991).

### ***Unsupervised Time Expenditure After School***

The inability of parents to personally supervise their children in the after-school hours often forces them to find alternative forms of care or else leave children unattended. An important topic of investigation has involved the impact of the exact nature of youth's care situations on antisocial behaviors. Most research has concluded that unsupervised out-of-home care (e.g. "hanging out" with friends without adults present) places youth at the greatest risk for delinquency (Steinberg, 1986; Pettit et al., 1997), particularly for those youth who are also poorly supervised by their parents (Flannery, Williams, & Vazsonyi, 1999; Coley, Morris, & Hernandez, 2004).

Interestingly, unsupervised care in-home has demonstrated mixed effects on delinquency. While some research found youth home alone during after-school hours to have increased levels of antisocial behavior and substance use (Coley, Morris, & Hernandez, 2004), contradictory conclusions have described lower levels of delinquency for unsupervised youth at home (Steinberg, 1986; Flannery, Williams, & Vazsonyi, 1999). Upon closer inspection, the varying impact of unsupervised out-of-home care, in comparison to unsupervised in-home care, indicates that low supervision is particularly problematic for children who spend their time away from home in unsupervised activities with other peers (Steinberg, 1986).

A major problematic component of unsupervised time expenditure is the heightened association with negative peers under such conditions. Youth who are left unsupervised after school often spend a larger portion of their free time with other children (Galambos & Maggs, 1991; Yin, Katims, & Zapata, 1999), particularly deviant peers. To illustrate this relationship between supervision and increased association with antisocial peers, Dishion and his colleagues (1991) studied a sample of boys and their families when the boys were 10 years, and again at age 12, to assess the school and familial experiences that predict antisocial peer involvement and delinquency. Their research revealed that youth with high levels of negative peer involvement were characterized by poor parental monitoring and discipline practices in middle childhood.

Increased interaction with negative peers creates a context where antisocial behavior is initiated, maintained, and accelerated through social influence (Osgood et al, 1996; Mahoney & Stattin, 2000). Many researchers have come to this same

conclusion, finding that the distance from adult supervision increases susceptibility to peer pressure. With the low probability of detection by adult guardians, youth are more likely to succumb to the peer pressures which, in turn, lead to elevated levels of delinquent activity (Steinberg, 1986; Galambos & Maggs, 1991; Flannery, Williams, & Vazsonyi, 1999; Coley, Morris, & Hernandez, 2004).

Steinberg (1986), for example, collected data on the susceptibility to peer pressure for a group of 865 adolescents in grades five through nine. Comparing youth in different types of self care, he found that youth who “hung out” with other juveniles in unsupervised activities after school were most susceptible to peer pressure. This result was not found for youth who were home alone during after-school hours, implying that it is the combination of low parental monitoring and delinquent peer association that has the greatest influence on youth propensity to engage in delinquent activities.

To avoid the negative influences of unsupervised time expenditure and association with deviant peers, youth who cannot be supervised at home are often placed in extracurricular activities. General participation in extracurricular activities, however, is insufficient to predict peer associations and delinquent involvement due to the inconsistent conclusions drawn from research on extracurricular activities. While some studies have found participation in extracurricular activities to reduce delinquency (Yin, Katims, & Zapata, 1999; Mahoney, 2000; Mahoney & Stattin, 2000; Mahoney & Cairns, 2001;) and substance use (Jenkins, 1996; Van Nelson et al., 1991; Duncan et al., 2000; Pope, Ionescu-Pioggia, & Pope, 2001), other studies demonstrated extracurricular involvement to have null (Hirschi, 1969; Gottfredson,

1984; Carlini-Cotrim & de Carvalho, 1993) or negative impacts on antisocial behavior (Mayton et al., 1991; Polakowski, 1994).

Further investigation into this inconsistency has suggested that it is the exact nature of leisure activities in the after-school hours that determines the type of influence the activities have on levels of negative peer association and delinquency (Hawdon, 1999). Regular participation in unstructured activities (e.g. watching television, “hanging out”) places youth in more frequent unsupervised contact with antisocial peers. Conversely, adolescents involved in structured, prosocial activities tend to interact with fewer peers who use drugs or alcohol, or who skip school. Thus, the impact of extracurricular activities on engagement in delinquent activities and substance use appears to be mediated by peer associations (Eccles & Barber, 1999).

Osgood and his colleagues (1996) tested the impact of routine activities on deviant behavior utilizing longitudinal self-report data from the Monitoring the Future study. Consistent with prior research, unstructured socializing activities with peers (i.e. joyriding in cars, visiting friends, and going to parties, and spending unsupervised evenings away from home) demonstrated consistent positive associations with criminal behavior and substance use. On the other hand, structured social activities outside of the home, such as participating in community affairs, and engaging in active sports, did not appear to increase delinquent activities. These findings lend support to the conclusion that routine participation in unstructured activities increases association with other deviant peers, leading to higher rates of substance use delinquency. The types of leisure activities that youth participate in, however, is largely influenced by levels of supervision, with unsupervised youth

more likely to select unstructured activities with high peer involvement (Mahoney & Stattin, 2000).

### ***After-school Programs***

Considering the empirical links between lack of parental supervision/monitoring, delinquent peer association, and unstructured, unsupervised time expenditure with antisocial behavior, in addition to the high rate of crime in the after-school hours, after-school programs possess a real potential for reducing juvenile delinquency. By increasing supervision, structure, and associations with prosocial youth and adults, after-school programs can help to counter some of the social hazards that threaten youth, including exposure to delinquent peer models, drug abuse, gang activity, and criminal involvement or victimization (National Institute of Justice, 1997).

Unfortunately, evaluations of after-school program effectiveness have been uncertain and inconsistent. Single and meta-analytic studies have frequently found participation in after-school programs effective for preventing and reducing delinquency. The work of Gottfredson and her colleagues (2004b) demonstrated the positive impact of program participation on delinquent outcomes by combining the results of 14 after-school program evaluations from across the state of Maryland. The results implied that participation in after-school programs reduced the delinquent behavior for middle-school aged youth, particularly for programs that emphasized social skills and character development. In another statewide evaluation conducted by Gottfredson, Soulé, and Cross (2004a), after-school programs funded by the Maryland After School Opportunity Fund Program (MASOFP) were successful in

reducing the delinquent behavior (excluding substance use) of secondary school youth in comparison to non-participants.

A few studies, however, failed to reach the same conclusions, finding that after-school program participation can even increase offending in certain situations. For example, youth attending Swedish recreation centers had a higher prevalence and incidence of delinquency in comparison to non-participants. The authors, however, attribute the negative findings to the lack of structure within the recreation centers and to the high concentration of deviant peers (Mahoney & Stattin, 2000; Mahoney, Stattin, & Magnuson, 2000), which coincide with previous research stressing the importance of structure and peer influence for mediating the impact of supervision on delinquency.

Expanding on the research related to the general effectiveness of after-school programs, only one study conducted a mediational analysis to determine what program-induced intermediate changes are necessary to elicit positive behavioral improvements. Using data from an evaluation of Maryland's After-School Community Grant Program (MASCGRP), Gottfredson and her colleagues (2004b) examined the impact of various intermediate objectives on the degree of program effectiveness. The results concluded that after-school programs decreased delinquent behavior by increasing intentions not to use drugs and association with positive peers. The improvement in behavior was not attributable to either the reduction in time spent unsupervised or by the increased involvement in constructive activities.

The persistent effect of after-school programs on delinquent behavior, despite the inclusion of the discovered mediators (Gottfredson et al., 2004b), suggests that

these variables alone are insufficient to explain all the beneficial effects of program participation. It is highly probable that other variables not included in the model, such as indirect parental supervision, are additionally responsible for the effectiveness of after-school programs. It could also be the case that the specific programs included in the evaluation were unable to produce an adequate reduction in unsupervised time to detect a significant mediational effect. Further research on the mediational mechanisms is necessary to clearly understand the factors that contribute to the positive impact of after-school programs.

## ***Socioeconomic Status and After-school Program Effectiveness***

In addition to understanding the mechanisms responsible for effective after-school programming, it is important to investigate to whom the mediating relationships can be generalized. Assessing the influences of these mediating mechanisms on delinquency across population segments of varying backgrounds will help determine which youth would benefit most from after-school program participation.

Generally, background factors such as family income have little or no direct effect on delinquency. Instead, their effects often act indirectly through family process variables (i.e. maternal supervision). To illustrate, simple assessments of the impact of socioeconomic status on delinquency generally conclude that low family income predicts higher levels of delinquency (Stewart, 2003; Johnson et al., 1997; Johnson et al., 1995) and lower levels of substance use (Hoffmann, 2000). After controlling for family process variables (e.g. supervision and monitoring), however, the direct influence of income on misbehavior disappears (Demuth & Brown, 2004; Sampson & Laub, 1994; Laub and Sampson, 1988).

The findings of significant differences in after-school program impact on substance use according to socioeconomic status in the original MASOFP evaluation (Gottfredson, Soulé, & Cross, 2004a) has heightened curiosity regarding socioeconomic variations in the mediating processes associated with juvenile delinquency. Further investigation into these income-level variations in program impact is important for determining whether or not the hypothesized mechanisms have different influences on behavior for high and low income youth.



## **Socioeconomic Status and Parental Supervision**

Areas of low socioeconomic status often exhibit higher rates of latchkey status (children who are unsupervised by their parents) during after-school hours. This lack of parental supervision is often attributed to the Personal Responsibility and Work Opportunity Reconciliation Act of 1996, which required at least 25 percent of states' welfare caseloads to work or participate in work-related activities (U.S. General Accounting Office, 1997). This movement of welfare parents into the workforce decreased supervision and monitoring, and increased the need for alternative child care opportunities, especially in inner-city areas (Coley, Morris, & Hernandez, 2004).

In their longitudinal assessment of the well-being of low income families in the wake of this welfare reform, Coley, Morris, and Hernandez (2004) studied the impact of latchkey status and type of after-school care on delinquent outcomes. Their analyses determined that the youth from the lowest-income families were most likely to be in out-of-home supervision, while their higher-income counterparts were more often placed in home-based or formal program care. Similar conclusions have been drawn by other researchers, with youth of low socioeconomic status more often found in unsupervised care arrangements (Pettit et al., 1997), spending more time in unstructured activities than middle-class youth who spent a larger portion of their free time in highly structured activities supervised by their parents (Posner & Vandel, 1994; 1999).

Not only do low income youth demonstrate higher rates of unsupervised care, but the impact of type of after-school care also varies from that of middle-class youth. Latchkey status, for example, was correlated with more behavioral and emotional

problems, including increased juvenile delinquency, for youth in inner-city areas (Galambos & Maggs, 1991; Pettit et al., 1997; Wikstrom & Loeber, 2000). The work of Pettit and his colleagues (1997) further illustrates the varying impact of supervision on delinquency according to income level. To test whether type of after-school care in elementary school (kindergarten to fifth grade) predicted behavioral adjustment and academic performance in sixth grade, the authors collected teacher ratings and conducted yearly parent interviews for 466 youth and their families. The analyses indicated that involvement in certain types of care is a risk factor for later behavioral problems, with the greatest impact for low income youth.

For example, Pettit and colleagues (1997) found that children in self-care from homes of lower socioeconomic status had higher teacher-rated externalizing problems than those not in self-care, but for middle-class youth, self-care had no significant impact. In addition, being in sitter/relative care or participating in adult-supervised activity-oriented care were both protective for low income youth in terms of social competence and externalizing problems, while behavioral outcomes for higher-income youth were unaffected by these types of after-school care situations. Although not testing the effectiveness of after-school program participation directly, this evidence of a significant interaction between socioeconomic status and type of care on behavioral problems suggests that after-school supervision has a larger impact, whether positive or negative, on youth from lower socioeconomic backgrounds, increasing the importance of after-school program availability for low income youth.

## **Socioeconomic Status and After-school Programs**

Considering the significant negative impact of poor parental supervision, especially for low income youth, the lack of structured school programs in high-poverty urban areas is an issue of concern (Coley, Morris, & Hernandez, 2004). Conducting a budget projection study following the 1996 enactment of the welfare reform law, the United States General Accounting Office (1997) found that as little as 20 percent of the demand for after-school programs will be met in poor urban areas. Similarly, another study assessing the 1993 to 1994 school-year reported that 70 percent of public schools in inner-city areas were lacking before- and after-school programs (National Center for Education Statistics, 1996). The scarcity of after-school programs in low income areas is troubling when considering the data suggesting that these programs have the greatest impact on delinquency for youth of lower socioeconomic status.

The variation in after-school program impact according to socioeconomic status was illustrated by Gottfredson, Soulé, and Cross (2004a). In their evaluation of MASOFP after-school programs across the state of Maryland, participation was found to be more effective for youth in poverty, relative to more advantaged youth, in terms of decreasing substance use and victimization, as well as improving academic performance. Furthermore, the authors discovered that MASOFP programs effectively reduced unsupervised activities for youth in poverty (relative to the non-participant controls), which may have mediated the relationship between socioeconomic status and after-school program impact.

## ***The Present Study***

Understanding the mechanisms responsible for after-school program effectiveness is important for developing programs most capable of eliciting positive behavioral change, as well as for predicting the types of youth that will benefit most from program attendance. The current study utilizes the longitudinal data from the evaluation of Maryland After School Opportunity Fund Program (MASOFP) after-school programs (Gottfredson, Soulé, & Cross, 2004a) to gain a better understanding of the determinates of delinquency that can, in turn, aid in the development of effective after-school programming. Rather than comparing the effectiveness of MASOFP program participation to non-MASOFP participants (as was done in the original study), the current research focuses on the relationships between *any* self-reported after-school program participation (including participation in non-MASOFP-funded programs)<sup>1</sup>, level of parental monitoring, association with prosocial peers, unsupervised time after school, and delinquent behavior in order to assess the mediating mechanisms responsible for behavioral change over time, as well as to determine the influence of income-level on the potential mediators.

Based on prior research, the hypotheses related to the effects of after-school programs in the present analysis predict that, 1) After-school program participation reduces all forms of delinquency; 2) Low parental supervision, greater unsupervised time after school, and less interaction with positive peers are related to higher levels of delinquency (i.e. property crimes, violent crimes, substance use, and total delinquency); and 3) The effectiveness of after-school program participation in

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<sup>1</sup> Including non-MASOFP youth allows for a wider-variety of after-school programs to be assessed, rather limiting the evaluation to the highly structure MASOFP programs. Change in the inclusion criteria also differentiates the current evaluation from research that had already been conducted.

reducing delinquent offending of all types can be partially explained by the increase in parental supervision, the increase in positive peer association, and the decrease in unsupervised time after school.

In regard to the influence of income, also predicted by previous literature, the hypotheses claim that, 4) Low family income is related to lower parental supervision, lower association with positive peers, and higher levels of unsupervised time usage; 5) Low income is related to elevated levels of delinquency (property and violent crimes), but reduced levels of substance use; 6) The effect of family income on delinquency is mediated by supervision level, association with positive peers, and unstructured time usage; 7) After-school program participation is differentially effective for youth from low and higher income families; and 8) The interaction between income and after-school program effectiveness can be explained by a larger effect of after-school program participation for increasing parental supervision level, increasing positive peer association, and decreasing unsupervised time expenditure for low income youth than for youth of higher-income levels.

## CHAPTER 3: RESEARCH METHODOLOGY

### *Participants*

In the original MASOFP outcome evaluation, participants included those middle-school youth who voluntarily attended a MASOFP-funded after-school program from across the state of Maryland, as well as a group of matched comparison students from neighboring schools. Only the 499 youth who completed the MASOFP Secondary School Level survey at pre-test and post-test (75% of the pre-tested youth) during the 2002-2003 school-year are included in the present analysis.

As indicated in Table 1, nearly two-thirds (62%) of the participants in the current sample are female. The average age at pre-test is 12.4 years, with age ranging from 10 to 17 years, and the typical participant is in the 7<sup>th</sup> grade. Almost half (49%) of the youth in the current study categorize themselves as Black, followed closely by White (42%). The remaining youth are Latino (2%)<sup>2</sup>, Native American/Alaskan Native (2%), Asian-American/Pacific Islander (1%), or “other” (4%). In regard to income, as measured by receiving a free or reduced school lunch (described below), 46 percent are categorized as low income. Furthermore, although the purpose of the original study was to compare MASOFP program youth to a group of comparison students, the current study compares after-school program participants to non-participants, regardless of whether the programs were funded by MASOFP<sup>3</sup>. Over three-quarters (85%) of the current sample report at least some attendance at an after-

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<sup>2</sup> Youth were able to categorize themselves as Latino, realizing that Latino is not a racial category.

<sup>3</sup> Youth in the comparison group were able to attend the afterschool programs available at their schools that were not funded through the MASOFP initiative.

school program during the period between pre-test and post-test. Table 1 provides a further breakdown of participant demographic characteristics at baseline.

## ***Measures***

The MASOFP Secondary School Level survey included a total of 173 items measuring youth behaviors, perceptions, and wellbeing. Specifically, the measures of demographic characteristics, income level, after-school program participation, parental monitoring, association with positive peers, unsupervised time expenditure, and a variety of delinquent behaviors are utilized to address the current research questions.

*Demographics:* The survey includes questions pertaining to youth gender, age, grade level, and race. These measures (excluding grade level) are used as control variables in the main analyses<sup>4</sup>.

*Income Level:* A single survey item measures the approximate income level at pre-test. Youth are asked to report whether or not they receive a free or reduced lunch at school. Eligibility to receive a free or reduced school lunch is determined by federal Income Eligibility Guidelines for the National School Lunch Program (United States Department of Agriculture, 2004). This program awards youth from low income families with free or reduced school lunches based on household income and size.

*After-school Program Participation:* One survey item asks youth to indicate whether or not they are currently attending an after-school program. Responses to this item at pre-test and post-test are used together to create a three-point measure (0 to 2)

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<sup>4</sup> Grade level is not included as a control variable to due multicollinearity issues with the measure of youth age.

of the extent and consistency of after-school program participation. Those who indicate no involvement at pre-test or post-test are recoded as “none” (0). Youth are coded as having “some” (1) involvement if they respond in the affirmative at only one time-point (either pre-test or post-test). Affirmative responses for both the pre-test and the post-test are coded as having “a lot” (2) of after-school program participation during the study period<sup>5</sup>.

*Parental Monitoring:* The level of parental monitoring is assessed using 14 survey items (pre-test  $\alpha=.71$ , post-test  $\alpha=.79$ ). This broad scale of parental monitoring captures both direct and indirect (i.e. parents’ knowledge of youth whereabouts, friends, and behavior) supervision. Examples of such items include, “My parents almost always know where I am and what I am doing,” “My parents usually know if I do something wrong,” and “My parents usually know how well I am doing in school.” The scale is computed by averaging the youth’s responses to each of the dichotomous (coded 0 or 1) items. Possible scores on the parental monitoring scale range from zero to one, with higher scores indicating a greater level of parental monitoring. See Appendix A for a further description of the parental monitoring scale measures and coding scheme.

*Positive Peer Influence:* The composition of youth peer groups is estimated by a seven-item “mostly true” or “mostly false” scale measuring positive peer influence (pre-test  $\alpha=.67$ , post-test  $\alpha=.62$ ), including questions asking whether the youth’s friends try to get him/her to do things the teacher doesn’t like and whether

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<sup>5</sup> A different measure of program participation is used for the current evaluation so that non-MASOFP youth who attended an after-school program are also included. The new measure also approximates consistency of participation to distinguish constant attendance from youth who partially attended and those who never attended an after-school program.



most of the youth's friends think getting good grades is important. The scale is computed by averaging the youth's responses to each of the dichotomous items. Possible scores on the positive peer influence scale range from zero to one, with higher scores indicating a greater association with positive peers. See Appendix B for a more detailed description of the positive peer influence scale and coding scheme.

*Unsupervised Time Expenditure:* Four separate items are used to assess unsupervised time expenditure. Three of the items are continuous measures of the self-reported number of days per week, 1) *home alone*, 2) *home watching younger siblings*, and 3) *with friends unsupervised*, all ranging from zero to seven days per week. The fourth item captures the number of *hours per day unsupervised* after school (on a scale ranging from 0 to 3). To create one comprehensive measure of unsupervised time after school, the highest number of days unsupervised from the three supervision categories (i.e. home alone, home watching younger children, and unsupervised with friends) is multiplied by the number of hours per school day in self-care to estimate the number of hours unsupervised per week. For the measure of the highest number of days unsupervised, missing or invalid responses are replaced by the mean number of days for the entire sample<sup>6</sup>. Missing or invalid values for the ordinal measure of hours per day in self-care are imputed with the lower, more conservative average response value<sup>7,8</sup>. Before the responses are multiplied together,

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<sup>6</sup> The average at pre-test (3.61 days) is imputed for 73 cases and the post-test mean (3.59 days) is imputed for 87 cases.

<sup>7</sup> The average response falls between less than one hour per day (coded as 1) and 1 to 3 hours per day (coded as 2) for the pre-test and post-test measures. Considering the ordinal nature of the data, the code of 1 is imputed for this item. Responses are imputed for 57 cases at pre-test and 58 cases at post-test. It is also important to note that rounding the imputed value to the higher average response (coded as 2) produces similar results as when the value of "1" is imputed.

the number of days is multiplied by 5/7 to estimate the number of *weekdays*, rather than the number of days during the *entire week*, so that the data format match the item corresponding to the number of hours unsupervised *after school*.

*Delinquency:* Delinquent behavior is assessed using 18 survey items. For the pre-test, youth are asked to report on their delinquent behaviors over the last year, while the post-test includes delinquency measures for the previous three months, helping to ensure that the pre and post time frames do not overlap<sup>9</sup>. Examples of questions capturing delinquent activity ask if the respondent had, “Stolen or tried to steal something worth more than \$50,” “Hit or threatened to hit other students,” and “Drunk beer, wine, or ‘hard’ liquor.” Each individual item is dichotomized into “yes” or “no” responses, coded as zero and one, respectively. These items are utilized to produce separate binary measures for *property crimes*, *violent crimes*, and *substance use*, plus a combined *total delinquency* measure, with higher scores indicating *any* delinquent involvement. The measure for *property crimes* is composed of seven items, while the *violent crimes* and *substance use* measures are both made up of five items. The measure for *total delinquency* incorporates all 18 items<sup>10</sup>. See Appendix C for information on specific measures and coding schemes.

Table 1 displays the demographic characteristics described previously. Also indicated in the table is the extent of after-school program participation during the

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<sup>8</sup> For a discussion of the benefits of imputation, see Collins, Schafer, & Kam, 2001; Schafer & Graham, 2002; Graham, Cumsille, & Elek-Fisk, 2003. In the current analysis, mean imputation is utilized, realizing that one of the more sophisticated methods of imputing data would be superior.

<sup>9</sup> The average time between pre-test and post-test is four months and ranged from one to seven months.

<sup>10</sup> One item, “Belonged to a gang that has a name and engages in fighting, stealing, or selling drugs”, is included in the *total delinquency* measure but is excluded from the subtype measures because it does not fit exclusively into one of the three crime categories.

study period. Nearly three quarters (71%) continue attending an after-school program from pre-test to post-test and another 14 percent report some participation, although their participation is not consistent over the entire reporting period. Fifteen percent (15%) of the youth report no participation in an after-school program.

The baseline behavioral indicators relevant to the current study are reported in Table 2. In regard to parental supervision, the scale mean is .83 and ranges from .23 to 1.0. The mean of positive peer influence is .71 on a scale from 0 and 1. At pre-test, in regard to unsupervised time usage, youth spend an approximate average of 5.7 hours per week without adult supervision after school, ranging from 0 to 15 hours. In terms of delinquency, the primary outcome variable of interest, over half (61%) of the participants report at least some delinquent involvement at baseline (also ranging from 0 to 1). Separating the delinquent behaviors into offense categories, the proportion of the respondents who report at least one property crime, violent crime, and/or some substance use is of .34, .49<sup>11</sup>, and .30, respectively, all of which having baseline proportions ranging from 0 to 1.

### ***Validity and Reliability of Self-Report Measures***

The use of self-report methods to measure attitudes, beliefs, and behaviors is widespread in the research field. Previous studies employing self-report measures have attested to the strong concurrent and predictive validity of such measures (Huizinga & Elliott, 1986; Farrington et al., 1996). They have also demonstrated youth willingness to accurately report information on delinquent activities (Espiritu et

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<sup>11</sup> The prevalence of violent offending is primarily driven by one item asking whether the youth had “hit or threatened to hit other students”, which is reported by 44% of the youth. The remaining items in the violent crimes scale are only reported by 5 to 12 percent of the youth.

al., 2001). In regard to delinquency, self-report measures are usually considered to be more accurate than official records because self-reports include incidents that were not detected, not reported, or not processed by the police as delinquent, and therefore not captured in official data. More generally, the evidence supporting the validity of self-report data, combined with the moderate to high reliabilities of the items within each of the scales, indicate the appropriateness of the measures for capturing the constructs of interest.

To determine the appropriateness of *school lunch status* for approximating income level, the convergent validity of school lunch status with other available measures of income is assessed. Correlations are computed (at the aggregate program level) between the percent receiving free or reduced school lunches and other official measures of income (i.e. median household income, percent of the population below the poverty level, and average household size) taken from the 2000 Census (United States Census Bureau, 2005). This analysis reveals that free school lunch status is significantly correlated with the 2000 Census income measures of median household income ( $r=-0.39, p<.01$ ) and percent of the population below the poverty level ( $r=0.35, p<.05$ ), as would be expected for school lunch status to be a valid proxy for household income. In regard to delinquency, the correlation between school lunch status and total delinquency ( $r=0.19, p>.05$ ) is in the expected direction, indicating a non-significant positive relationship between school lunch status and delinquency. This finding corresponds to the non-significant correlations between other official measures of income (i.e. median household income and percent below poverty level) and total delinquency ( $r=-0.12$  and  $r=.06$ , respectively). To further determine the

reliability of the school lunch variable, another correlation is computed between the pre-test and post-test measure of school lunch, with the results indicating a significant positive correlation ( $r=.85, p<.01$ ). The combination of these analyses lends support for the use of school lunch status as a valid measure of family income.

### ***Analytic Strategy***

To assess the mechanisms responsible for effective after-school programming, a number of preliminary analyses are conducted.

*Hypothesis 1: After-school program participation reduces all forms of delinquency.* The general effectiveness of after-school program participation in reducing delinquency of every type is determined using probit analysis, with the measures of age, gender, race<sup>12</sup>, and delinquent behavior at pre-test (corresponding to the type of delinquency assessed at posttest) included as control variables.

Considering that participation in MASOFP after-school programs was found to be effective in the original evaluation, one-tailed analyses were conducted.

*Hypothesis 2: Low parental supervision, greater unsupervised time after school, and less interaction with positive peers are related to higher levels of delinquency.* Next, to confirm the influences of the three mediating factors on delinquency found in previous research, we conduct separate zero-order probit analyses for each mediator to measure their association with each type of delinquent

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<sup>12</sup> Race is recoded into two dummy variables for “black or African-American” and “other race” (i.e. Native American/Alaskan Native, Asian American/Pacific Islander, Latino, and “other), with “white” youth representing the omitted or comparison category. Youth are able to categorize themselves as Latino, realizing that Latino is not a racial category.

behavior (i.e. property crime, violent crime, and substance use) as well as delinquency in general.<sup>13</sup>

*Hypothesis 3: The effectiveness of after-school program participation in reducing delinquent offending of all types can be partially explained by the increase in parental supervision, the increase in positive peer association, and the decrease in unsupervised time after school.* To test the main mediational hypothesis, the previous probit analyses of after-school program participation and each type of delinquent behavior are replicated while also including in the model the degree of change (i.e. the difference in the mediator scale score from pre-test to post-test) in the three mediating variables separately. The same control variables of age, gender, race, and pre-test delinquency are also included.

The second part of the analysis delves into the relationship between income and program impact found in the original evaluation.

*Hypothesis 4: Low family income is related to lower parental supervision, lower association with positive peers, and higher levels of unsupervised time usage.* Independent samples t-tests are conducted to see whether low family income is related to each of the mediators. More complicated analytic strategies<sup>14</sup> are considered, but due to the non-normal distribution of the mediating variables, and since the various analyses produce similar results, only the t-test findings are reported.

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<sup>13</sup> We replicate each probit analysis including the control variables of age, gender, race, and delinquency at pretest. Only one analysis regarding unsupervised time and violent offending produces differing results with the inclusion of control measures.

<sup>14</sup> Tobit and ordered probit analyses are conducted and produce results comparable to the independent samples t-test.

*Hypothesis 5: Low income is related to elevated levels of delinquency (property and violent crimes), but reduced levels of substance use.* Chi-squared test for independence measure the general association between income and each offense type. Subsequent probit analyses are conducted to determine whether low income is related to elevated levels of delinquency (property and violent crimes), but reduced levels of substance use, with age, gender, and race included as controls.

*Hypothesis 6: The effect of family income on delinquency is mediated by supervision level, association with positive peers, and unstructured time usage.* For the instances where income are significantly related to delinquent behavior, pre-test measures of parental supervision, positive peer influence, and unsupervised time usage are added separately to the previous probit analyses to determine if the income effects are no longer significant, as predicted by previous research (Demuth & Brown, 2004; Sampson & Laub, 1994; Laub and Sampson, 1988).

*Hypothesis 7: After-school program participation is differentially effective for youth from low and higher income families.* The next analyses attempt to produce the interaction effects of income and after-school program participation on delinquency found in the original MASOFP study. Probit analyses are used again, including the measures of after-school program participation, income, and the interaction of program participation and income, while controlling for age, gender, race, and pre-test delinquency<sup>15</sup>, to determine their influence on each type of delinquent behavior.

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<sup>15</sup> In the original MASOFP evaluation, the amount of time that elapsed between pre- and post-testing was included as a control since this measure differed by income-level. The present study also conducts the analyses using this measure as a control, but since the results are similar with and without the variable, and since the variable itself is not significant, the results presented reflect the analysis with the variable excluded.

*Hypothesis 8: The interaction between income and after-school program effectiveness can be explained by a larger effect of after-school program participation for increasing parental supervision level, increasing positive peer association, and decreasing unsupervised time expenditure for low income youth than for youth of higher-income levels.* For the crime types in which program participation appears to be differentially effective for youth from low and higher income families, the previous probit analyses are replicated including the measures of change in parental supervision, positive peer association, and unsupervised time usage separately to assess whether improvements in the three mediating factors explain the apparent interaction.



## CHAPTER 4: RESULTS

This chapter reports the results obtained from the analyses previously described. The first section addresses the hypotheses specific to the mechanisms responsible for the positive impact of after-school programming. The second portion of the chapter reports the findings regarding the relationship between income and program effectiveness.

### *Impact of After-school Program Participation on Delinquency*

To understand what makes after-school programs effective in reducing delinquent behavior, it is important to first determine what *types* of delinquent behaviors can be reduced and/or prevented through program participation (Hypothesis 1). Comparing the prevalence of delinquency over time (while controlling for age, gender, and race), as illustrated in Table 3, after-school program participation is associated with reduced levels of general delinquency ( $p < .01$ ), as found in the original MASOFP evaluation. When considering offense type, the prevalence of property and violent offending are both significantly reduced for those youth with higher levels of program participation ( $p < .01$  and  $p < .05$ , respectively). For substance use, although after-school programs reduce drug-related offending, the differences are not significant ( $p = .34$ ).

***Influences of Low Parental Supervision, Low Positive Peer Influence, and High Amounts of Unsupervised Time Usage on Delinquency***

The proposed logic behind after-school programs is that they reduce delinquency by increasing parental supervision of youth behavior, increasing association with positive peers, and reducing the amount of time spent unsupervised in the hours following school closure. Before this relationship can be tested, the general relationships between these variables and delinquency proposed in Hypothesis 2 are ascertained.

A series of probit analyses are conducted to estimate the influence of the three potential mediators on delinquency. The findings, displayed in Table 4, reveal that higher levels of parental supervision are significantly related to lower levels delinquency for each offense type ( $p < .001$  for each crime type). The same protective relationship is found between positive peer association and delinquency, with youth who report greater involvement with prosocial peers less likely to engage in property offending, violent offending, and substance use, as well as delinquency in general ( $p < .001$  for each relationship). The hypothesized relationship between the amount of unsupervised time after school and delinquency of all types is also confirmed ( $p < .001$  for all analyses). The more time students spend unsupervised in the after-school hours, the more delinquent involvement they report.

### ***Impact of Changes in Parental Supervision, Positive Peer Influence, and Unsupervised Time Usage on Post-test Delinquency***

The next probit analyses test whether the effectiveness of after-school programs can be attributed to the increase in parental supervision and positive peer influence, and to the reduction in unsupervised time after school, as indicated in Hypothesis 3.

#### **Parental Supervision**

The impact of improvement in parental supervision is assessed separately for each type of offense. As indicated in Table 5, youth who exhibit increased levels of parental supervision at post-test are significantly less likely to report property offending and substance use after program participation ( $p < .05$  and  $p < .01$ , respectively). Although parental supervision impacts the prevalence of property offending, the change cannot be attributed to program participation since the inclusion of parental supervision does not alter the significant main effect of after-school programs. After-school program participation is also not responsible for the reduction in substance use due to the generally insignificant relationship between program attendance and the prevalence of substance use. Improvement in the level of parental supervision is associated with a lower prevalence of total delinquency, but the relationship does not reach a traditional level of significance ( $p < .1$ ). For violent offending, parental supervision does not exhibit a significant impact, concluding that parental supervision cannot account for the beneficial effects after-school programming on violent offending, or any other type of delinquent behavior.

## **Positive Peer Influence**

Adding the measure of change in positive peer influence to the probit models of after-school program participation and delinquency reveals significant results for substance use only (Table 6). These findings imply that the increase in positive peer influence can only help to explain reductions in substance use ( $p < .05$ ), although these behavioral improvements themselves cannot be attributed to after-school programming since the previous analysis failed to discover a significant relationship for program attendance in general. The increase in positive peer association is negatively related to property offending, but the relationship is only marginally significant ( $p < .1$ ). Contrary to the hypothesized relationship, improving positive peer association does not appear to be a mechanism through which after-school programs produce effective results on delinquent behavior.

## **Unsupervised Time Usage**

The analyses testing the influence of change in unsupervised time usage on delinquency discover that although increasing unsupervised time is related to an increase in delinquency, the relationship does not reach significance for any of the offense types. Table 7 displays the coefficients for the analyses related to unsupervised time. As the table illustrates, the program-induced reductions in delinquency cannot be explained by the hypothesized decrease in the number of hours unsupervised after school.

### ***Influence of Low Income on Parental Supervision, Positive Peer Association, and Unsupervised Time Expenditure***

To help understand the differential effect of after-school program attendance on delinquency for youth from low and high income families reported in the original MASOFP evaluation, a set of analyses are conducted to first assess the relationship (proposed in Hypothesis 4) between income and the three potential mediating variables. The findings from the independent samples t-test analyses<sup>16</sup> reveal that youth who receive free or reduced school lunches report significantly lower levels of parental supervision at pre-test ( $t=2.36, p<.05$ ). Initial levels of positive peer influence ( $t=1.10, p=.27$ ) and amount of unsupervised time ( $t=0.08, p=.94$ ), however, are not significantly different for youth from high and low income families. These results suggest that the differential effect of after-school program participation by income could possibly be explained by initial differences in parental supervision, but not by positive peer influence or unsupervised time usage.

### ***Influence of Low Income on Delinquency***

The general association between income and the various offense types (predicted in Hypothesis 5) are first estimated using chi-squared tests for independence. The results show that the prevalence of property offending ( $\chi^2=0.02, p=.88$ ), violent offending ( $\chi^2=1.05, p=.31$ ), and substance use ( $\chi^2=1.98, p=.16$ ) are not significantly different for those from high and low income families. Although youth from low income backgrounds report proportionally higher rates of total delinquency

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<sup>16</sup> As previously noted, tobit and ordered probit analyses are also conducted and produce results comparable to the independent samples t-test. For simplicity, only the t-test results are reported.

than their higher-income peers, the difference does not reach traditional levels of significance ( $\chi^2=3.72, p<.1$ ). After controlling for youth age, gender, and race, probit analyses find that income level is not significantly related to any form of delinquency, including property offenses, violent offenses, and substance use. Table 8 contains the coefficients produced by these analyses for each offense type. Due to the lack of a significant impact of income on delinquency, the mediational effects of parental supervision, positive peer association, and unsupervised time usage (proposed in Hypothesis 6) do not need to be assessed. The data lend support to the conclusion that income is neither directly nor indirectly related to delinquency.

### ***Interaction of Income and After-school Program Participation on Delinquency***

In the original MASOFP evaluation, participation in an after-school program was more effective for low income youth, particularly for reducing last-month substance use. Before trying to explain *why* after-school program participation is differentially effective for youth from high and low income families, analyses are first conducted to assess the level of significance for the interactions in the current study. As indicated in Table 9, contrary to Hypothesis 7, these analyses do not find evidence to suggest that after-school program participation is differentially effective for youth of varying income-levels.

This discrepancy from the original study could be primarily due to the differences in the measures used for each analysis. In the previous analysis, the measure of after-school program participation was indicated by whether or not the youth attend a MASOFP-funded program, while the current analysis utilizes a self-

report measure of program participation at two points in time that captures both participation and continuity of participation. In addition, while the original study used a continuous scale measure of delinquent behavior, the current analysis relies upon binary measures of *any* delinquency. It should also be noted that, in terms of delinquency-related outcomes, the original evaluation only found differences by income for last-month variety drug use, but not for last-year variety drug use or for general delinquency. Many of the income-based differences found in the original evaluation were for scholastic outcome measures that were not assessed in the current analysis.

The findings in the present analysis conclude that after-school program participation is equivalently effective for high and low income youth in terms of reducing property offending, violent offending, substance use, and total delinquency. Consequently, further assessment of Hypothesis 8 regarding the mediational influences of the supposed interactions is unnecessary for the current evaluation.

## **CHAPTER 5: DISCUSSION**

The purpose of the present study was to discover the intermediate changes responsible for the effectiveness of after-school programs in reducing juvenile delinquency. Identifying these mediating mechanisms would assist in developing programs most capable of eliciting behavioral improvements. Another key goal was to assess whether after-school programs are differentially effective for high and low income youth to ensure that program services are targeted to the youth who would benefit most.

In the original MASOFP evaluation, after-school program participation was found to be effective for reducing delinquency, but the researchers did not look at the impact of program participation on various types of delinquent behaviors (beyond general delinquency and substance use), such as distinguishing between violent and property offending. In the current study, analyses of effectiveness by crime type were conducted. The results revealed that youth who attended after-school programs reported lower levels of property offending, violent offending, and general delinquency, but participation was not significantly effective in reducing substance use.

When investigating the possible mechanisms responsible for the positive impact of after-school programs on property, violent, and general delinquent offending, research on the crime correlates suggest that parental supervision, delinquent peer association, and unsupervised time usage are three potential pathways through which after-school programs can elicit their desired effect on delinquency.



The current analysis validated these correlates of delinquency. High levels of parental supervision and positive peer association, as well as low amounts of unsupervised time after school, were all factors that protected youth from the propensity to engage in each type of delinquent offending (i.e. property crimes, violent crimes, substance use, and general delinquency).

The association between these factors and delinquency lent support to the hypothesis that after-school programs reduce juvenile delinquency by increasing parental supervision, increasing youth association with positive peers, and by reducing time spent unsupervised in the after-school hours. The current analysis, however, did not validate these hypotheses. Increasing parental supervision did not appear to play a role in the positive impact of after-school programming, although it did produce reductions in property offending and substance use (regardless of program attendance). In regard to peer influence, the increase in positive peer association was only predictive of lower levels of substance use at post-test, but these changes cannot be attributed to after-school programming. Lastly, reductions in the amount of time spent unsupervised in the after-school hours was not related to any type of delinquent offending. Contrary to the hypotheses, the behavioral improvements exhibited after participating in after-school programs cannot be attributed to any of the proposed intermediate factors (i.e. parental supervision, positive peer influence, and unsupervised time usage after school).

The current analysis also tried to explain the differential impact of program participation on delinquent behavior for high and low income youth found in the original evaluation. One hypothesis suggested that the discrepancy in effectiveness

could be due to initial differences in the proposed mediating factors. While the results implied that youth from low income families reported significantly lower levels of parental supervision at pre-test, there was no evidence of income-related baseline differences in positive peer influence or the amount of unsupervised time expenditure.

The next attempt to explain the income effects involved the assessment of the general relationship between income and delinquency. It was hypothesized that low income would be related to elevated levels of property and violent offending, and to reduced levels of substance use. Considering past research on income and delinquency (Demuth & Brown, 2004; Sampson & Laub, 1994; Laub and Sampson, 1988), the current hypotheses also predicted that any income effects that emerged upon first analysis would disappear after including measures of parental supervision, delinquent peer association, and unsupervised time. The findings revealed that income level was not directly or indirectly related to *any* type of delinquent offending.

Considering that the original MASOFP evaluation found a significant interaction between after-school program participation and income level on measures of substance use at post-test, the current analysis attempted to understand the differential impact by first measuring the significance of the interaction effects in the current evaluation. The relevant hypotheses suggested that the significant interactions could be attributed to varying levels of improvement in the proposed mediating factors (i.e. parental supervision, positive peer association, and unsupervised time usage). The current analysis, however, failed to produce significant interactions as found in the original study. These discrepancies are most likely due to differences in

the particular measures used in the two analyses. While the original evaluation assessed program participation by whether or not the youth attend a MASOFP-funded program, the current analysis utilized a self-report measure of program participation (regardless of the funding source) at pre-test and post-test to simultaneously assess the consistency of participation. Additionally, the original study used a continuous scale measure of delinquent behavior, while the current analysis relied upon binary measures of *any* delinquency. It is also important to note that the original evaluation only found significant income interactions for last month variety drug use, which was not assessed in the present study. The original study did not, however, find any differential effects for general delinquency or substance use over the previous year. Most of the discrepancies in program effectiveness were related to academic outcomes that were also not evaluated in the current analysis. The results from the present study suggest that after-school programs are equally effective for youth from high and low income backgrounds in terms of preventing and/or reducing delinquency.

### ***Limitations***

Certain aspects of the current design potentially limit the validity and generalizability of the impending findings. One possible limitation is the reliance on self-report data, which could be impacted by participant memory and honesty. After considering the evidence demonstrating the validity of self report data (Huizinga & Elliott, 1986; Farrington et al., 1996; Espiritu et al, 2001), however, reliance on self-report data does not pose a major threat in this case.

A more plausible threat to validity is the reliance on school lunch status as the sole measure of socioeconomic status. The utilization of student reports justifies the appropriateness for using school lunch status to approximate family income, especially when considering the likelihood that middle school-aged youth cannot accurately report family income level beyond receipt of a free or reduced lunch at school. The convergent validity of school lunch status with other official measures of socioeconomic status attests to the appropriateness of the use of school lunch to represent family income. One limitation that still remains is the ability for the lunch variable to only contrast low income with all other income levels. This particular measure of income is not sensitive to income variations in the middle to high ranges.

The broadness of the parental supervision scale is also a threat to validity. The scale captures two different, although related, aspects of parental supervision (i.e. direct and indirect supervision). It is possible that the effects after-school program participation operate differently on the two types of supervision. It could be the case, for example, that attendance at an after-school program increases parental knowledge of their child's whereabouts, friends, and activities after school, but it does not influence parents' ability to physically supervise the youth. Without the ability to quantitatively distinguish between the two concepts, the findings related to parental supervision become slightly more difficult to interpret.

Another limitation to the current findings is the use of imputation to deal with the high quantity of missing data related to unsupervised time expenditure. By imputing a constant value for cases with missing or invalid survey responses, both the variability of the imputed variable and the correlation of the imputed variable with

other study measures are reduced. These effects could have resulted in the reduction in power for discovering a significant relationship between unsupervised time expenditure and delinquency at post-test.

### ***Future Research***

The inability of current study to adequately explain the mechanisms responsible for the positive impact of after-school programs does not necessarily suggest that manipulating parental supervision, positive peer association, and the amount of unsupervised time after school are insufficient to guarantee effective programming. This notion is supported by the vast research demonstrating the significant relationships between these intermediate factors and delinquency, as well as the findings of Gottfredson and her colleagues (2004b) on the mediational impact of positive peer association on after-school program effectiveness. It is likely that the particular programs in the current evaluation were unsuccessful in producing adequate changes in the proposed intermediate factors, which in turn prevented the detection of a significant mediational relationship. Another important difference between the current analyses and the previous study of mediating mechanisms (Gottfredson et al., 2004b) is the variation in program structure. The inclusion of highly-structured programs in the prior evaluation, compared to the wide variety of programs types in the current analysis, may help to explain the discrepancies regarding positive peer association. Replication of the current analysis with more structured programs capable of producing sizable changes in parental supervision, positive peer influence, and unsupervised time expenditure after school would increase the likelihood of detecting a significant mediational impact.

Further research is also needed to determine what other programmatic and/or protective factors should be manipulated through after-school programming in order to reduce juvenile delinquency. Although the selection of parental supervision, positive peer influence, and unsupervised time usage was supported by research on the correlates of delinquency, there still may be other theories that would recommend alternative mediators. For instance, the only prior study on mediators found that intentions not to use drugs and positive peer association were able to explain the influence of after-school program participation on delinquency (Gottfredson et al., 2004b). Program structure is another possible factor that deserves further investigation, particularly when considering the previously noted research on the influence of structured time on delinquency (Osgood et al., 1996; Jenkins, 1996; Van Nelson et al., 1991; Hawdon, 1999 Eccles & Barber, 1999 Yin, Katims, & Zapata, 1999; Duncan et al., 2000; Mahoney, 2000; Mahoney & Stattin, 2000; Mahoney & Cairns, 2001; Pope, Ionescu-Pioggia, & Pope, 2001). Also not assessed in the present study is the impact of program *type* on subsequent antisocial behavior. The preliminary study found that programs classified as “youth development”, which emphasize social problem solving instruction, produced the most consistent positive outcomes (Gottfredson, Soulé, & Cross, 2004a). This finding suggests that the *content* of the after-school programs may also be an important factor for maximizing program effectiveness.

### ***Implications for After-school Programs***

Understanding the mechanisms behind effective after-school programming will assist program developers in designing after-school programs most capable of

eliciting positive change in youth behavior. The findings of the current analysis suggest that other factors beyond parental supervision, positive peer association, and unsupervised time expenditure are responsible for effective programming. Further research will assist in discovering what other factors should be targeted by after-school programs in order to increase effectiveness.

Evaluating the influence of family income on program impact is also important for determining which youth could benefit most from after-school program attendance. Considering the welfare reforms and the budget cutbacks in the school-sponsored activities, provision of after-school programming for the youth who will benefit most is imperative for the efficient expenditure of scarce monetary resources. Since, however, after-school programs were found to be equally effective for low and high income youth in reducing juvenile delinquency, there is no evidence to support targeting low income youth, or youth from low income areas, for the limited after-school program resources. Youth from both high and low income families would benefit equally from the provision of after-school programming, leading to the reduction in property, violent, and general delinquent offending in their surrounding communities.

**Table 1: Youth Demographic Characteristics at Pre-test**

<b>DEMOGRAPHICS</b>	<b>DESCRIPTIVE STATISTICS</b>
<b>Percentage Female</b>	61.5%
<b>Age in Years (N=498)</b>	
Mean	12.36
SD	1.26
<b>Grade Level</b>	
Mean	7.09
SD	1.18
<b>Race</b>	
Black or African-American	48.9%
White	42.1%
Latino	2.4%
Native American or Alaskan Native	1.6%
Asian-American or Pacific Islander	0.8%
Other	4.2%
<b>Percentage receiving a free or reduced lunch at school (N=487)</b>	46.4%
<b>Level of After-school Program Participation (N=483)</b>	
None	14.7%
Some	13.9%
A lot	71.4%

*Note: Cases with missing or invalid information not included. When possible, demographic information missing at pre-test was replaced by data from the post-test. N=499 unless otherwise noted.*



**Table 2: Behavioral Indicators at Pre-test**

<b>BEHAVIORAL INDICATORS</b>	<b>DESCRIPTIVE STATISTICS</b>
<b>Parental Supervision Scale (N=490)</b>	
Mean	.83
SD	.17
<b>Unsupervised Time Usage – in hours per week (N=499)</b>	
Mean	5.66
SD	4.66
Highest number of days per week unsupervised (N=499)	
Mean	3.79
SD	2.35
Hours per week unsupervised after school (N=499)	
0 hours	9.0%
Less than 1 hour	31.1%
1 – 3 hours	31.3%
More than 3 hours	28.7%
<b>Positive Peer Influence Scale (N=489)</b>	
Mean	.71
SD	.24
<b>Delinquency</b>	
Any Property Crimes - proportion of youth (N=495)	
Mean	.34
SD	.47
Any Violent Crimes – proportion of youth (N=495)	
Mean	.49
SD	.50
Any Substance Use - proportion of youth (N=495)	
Mean	.30
SD	.46
Any Delinquency – proportion of youth (N=495)	
Mean	.61
SD	.49

*Note: Cases with missing or invalid information not included. Percentages may not equal 100 due to rounding. Higher scale values indicate greater parental monitoring, more positive peer influence, and higher levels of self-reported delinquency.*

**Table 3: Probit Coefficients for the Impact of After-school Program Participation on Delinquent Behavior at Post-test**

	<b>General Delinquency (N=472)</b>	<b>Property Crime (N=477)</b>	<b>Violent Crime (N=476)</b>	<b>Substance Use (N=473)</b>
After-school Program	-.22**	-.22**	-.15*	-.04
Age	.07	.14*	.04	.17**
Male	-.15	-.04	-.08	.03
Black	.16	.09	.17	-.04
Other race	.03	.03	.02	.03
Pre-test Delinquency	1.45***	1.35***	1.05***	1.35***

*Note: One-tailed tests of significance were conducted for the effects of after-school program participation. The pre-test measure of delinquency included as a control variable in each analysis corresponds to the type of behavior assessed at post-test.*

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$

**Table 4: Coefficients from the Separate Zero-order Probit Analyses for the Influences of Parental Supervision, Positive Peer Influence, and Unsupervised Time Usage at Pre-test on Delinquent Behavior at Post-test**

	<b>General Delinquency</b>	<b>Property Crime</b>	<b>Violent Crime</b>	<b>Substance Use</b>
Parental Supervision	-2.52*** (481)	-2.03*** (486)	-1.65*** (485)	-2.91*** (481)
Positive Peer Influence	-1.87*** (480)	-1.59*** (485)	-1.62*** (484)	-1.28*** (481)
Unsupervised Time	.08*** (489)	.06*** (494)	.05*** (493)	.09*** (490)

*Note: Number of cases in parentheses.*

\*\*\*  $p < .001$

**Table 5: Probit Coefficients for the Impact of Change in Parental Supervision on Subsequent Delinquent Behavior**

	<b>General Delinquency (N=458)</b>	<b>Property Crime (N=463)</b>	<b>Violent Crime (N=462)</b>	<b>Substance Use (N=458)</b>
After-school Program	-.26**	-.21*	-.20*	-.01
Change in Parental Supervision	-.69	-.82*	-.59	-1.10**
Age	.06	.13*	.02	.16**
Male	-.09	.01	-.05	.08
Black	.22	.11	.21	-.06
Other race	.04	.06	.01	.05
Pre-test Delinquency	1.51***	1.34***	1.12***	1.38***

*Note: The pre-test measure of delinquency included as a control variable in each analysis corresponds to the type of behavior assessed at post-test.*

*\*  $p < .05$*

*\*\*  $p < .01$*

*\*\*\*  $p < .001$*

**Table 6: Probit Coefficients for the Impact of Change in Positive Peer Influence on Subsequent Delinquent Behavior**

	<b>General Delinquency (N=463)</b>	<b>Property Crime (N=468)</b>	<b>Violent Crime (N=467)</b>	<b>Substance Use (N=464)</b>
After-school Program	-.20*	-.25**	-.13	-.05
Change in Positive Peer Influence	-.23	-.57	-.25	-.67*
Age	.08	.15*	.04	.16**
Male	-.15	-.04	-.06	-.01
Black	.16	.13	.18	-.02
Other race	-.06	-.01	-.08	-.12
Pre-test Delinquency	1.46***	1.37***	1.07***	1.39***

*Note: The pre-test measure of delinquency included as a control variable in each analysis corresponds to the type of behavior assessed at post-test.*

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$

**Table 7: Probit Coefficients for the Impact of Change in Unsupervised Time Expenditure on Subsequent Delinquent Behavior**

	<b>General Delinquency (N=472)</b>	<b>Property Crime (N=477)</b>	<b>Violent Crime (N=476)</b>	<b>Substance Use (N=473)</b>
After-school Program	-.21*	-.22*	-.15	-.04
Change in Unsupervised Time	.01	.01	.02	.01
Age	.07	.14*	.04	.17**
Male	-.14	-.04	-.07	.04
Black	.16	.09	.17	-.05
Other race	.02	.02	.01	.01
Pre-test Delinquency	1.46***	1.35***	1.07***	1.37***

*Note: The pre-test measure of delinquency included as a control variable in each analysis corresponds to the type of behavior assessed at post-test.*

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$

**Table 8: Probit Coefficients for the Relationship between Low Income and Delinquency**

	<b>General Delinquency (N=472)</b>	<b>Property Crime (N=477)</b>	<b>Violent Crime (N=476)</b>	<b>Substance Use (N=473)</b>
Free/Reduced School Lunch	.07	-.12	-.06	.17
Age	.09	.17**	.05	.19**
Male	-.13	-.04	-.02	-.06
Black	.04	.03	.12	-.07
Other race	-.02	.05	.00007	.10
Pre-test Delinquency	1.50***	1.31***	1.10***	1.41***

*Note: The pre-test measure of delinquency included as a control variable in each analysis corresponds to the type of behavior assessed at post-test.*

*\*\*  $p < .01$*

*\*\*\*  $p < .001$*

**Table 9: Probit Coefficients for the Influence of After-school Program Participation, Income, and the Interaction of Program Participation and Income on Delinquency**

	<b>General Delinquency (N=460)</b>	<b>Property Crime (N=465)</b>	<b>Violent Crime (N=464)</b>	<b>Substance Use (N=461)</b>
After-school Program	-.29*	-.27*	-.22*	-.15
Free/Reduced School Lunch	-.12	-.28	-.30	-.20
Program x School Lunch	.16	.11	.19	.25
Age	.08	.15**	.04	.18**
Male	-.16	-.05	-.06	-.05
Black	.11	.13	.17	-.05
Other race	.003	.04	.01	.05
Pre-test Delinquency	1.44***	1.34***	1.06***	1.38***

*Note: The pre-test measure of delinquency included as a control variable in each analysis corresponds to the type of behavior assessed at post-test.*

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$



## Appendix A: Parental Monitoring Scale Measures

ITEM	RESPONSE FORMAT
1. My parents keep close track of how well I am doing in school.	Mostly True/Mostly False
2. My parents usually don't know what I do after school.	Mostly True/Mostly False
3. It is important to tell the truth to your parents.	Mostly True/Mostly False
4. My parents almost always know where I am and what I am doing.	Mostly True/Mostly False
5. It is OK with my parents if I drink beer or wine once in a while.	Mostly True/Mostly False
6. My parents usually know how well I am doing in school.	Mostly True/Mostly False
7. My parents usually know if I do something wrong.	Mostly True/Mostly False
8. I can usually do whatever I want after school without my parents knowing what I am doing.	Mostly True/Mostly False
9. My parents let me smoke at home.	Mostly True/Mostly False
10. My parents would be very angry if I smoked cigarettes.	Mostly True/Mostly False
11. I would be in big trouble with my parents if I smoked marijuana.	Mostly True/Mostly False
12. Smoking cigarettes or drinking beer is OK with my parents as long as I stay away from other drugs.	Mostly True/Mostly False
13. I would be punished at home if my parents knew I broke a school rule.	Mostly True/Mostly False
14. If your friends wanted to go out and your parents wanted you to stay home for the evening, would you stay home?	Yes/No

*Note: If needed, items were recoded so that values of one indicated high parental monitoring and values of zero indicated low parental monitoring. The responses for all 14 items were averaged together for each youth to represent the general scale measure of parental supervision/monitoring.*

## Appendix B: Positive Peer Influence Scale Measures

ITEM	RESPONSE FORMAT
Respondents are asked to think about their friends.	
1. Most of my friends think school is a pain.	Mostly True/Mostly False
2. My friends often try to get me to do things the teacher doesn't like.	Mostly True/Mostly False
3. Most of my friends think getting good grades is important.	Mostly True/Mostly False
Respondents are asked to think about their best friend.	
4. My best friend is interested in school.	Mostly True/Mostly False
5. My best friend always attends classes.	Mostly True/Mostly False
6. My best friend plans to go to college.	Mostly True/Mostly False
7. My best friend gets into trouble at school.	Mostly True/Mostly False

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*Note: If needed, items were recoded so that values of one indicated higher levels of positive peer influence and values of zero indicated lower levels of positive peer influence. The responses for all seven items were averaged together for each youth to represent the general scale measure of positive peer influence.*

## Appendix C: Delinquency Scale Measures

ITEM	RESPONSE FORMAT
In the last year have you...	
<b>Property Crime Scale</b>	
1. Purposely damaged or destroyed property belonging to a school?	
2. Purposely damaged or destroyed <u>other property</u> that did not belong to you, not counting family or school property?	
3. Stolen or tried to steal something worth <u>more</u> than \$50?	0 = Never
4. Taken a car for a ride (or drive) without the owner's permission?	1 = Once
5. Stolen or tried to steal things worth <u>less</u> than \$50?	2 = Twice or More
6. Stolen or tried to steal something at school, such as someone's coat from a classroom, locker, cafeteria, or a book from the library?	
7. Broken or tried to break into a building or car to steal something or just to look around?	
<b>Violent Crime Scale</b>	
1. Carried a hidden weapon other than a plain pocket knife?	
2. Been involved in gang fights?	0 = Never
3. Hit or threatened to hit a <u>teacher</u> or other adult at school?	1 = Once
4. Hit or threatened to hit other <u>students</u> ?	2 = Twice or More
5. Used force or strong-arm methods to get money or things from a person?	
<b>Substance Use Scale</b>	
1. Smoked cigarettes?	
2. Used smokeless tobacco (snuff, chewing tobacco)?	0 = Never
3. Drunk beer, wine or "hard" liquor?	1 = Once
4. Smoked marijuana (weed, grass, pot, hash, ganja)?	2 = Twice or More
5. Taken hallucinogens (LSD, Ecstasy, mescaline, PCP, peyote, acid, XTC)?	
<b>Additional Item Included in Total Delinquency Scale Only</b>	
1. Belonged to a gang that has a name and engages in fighting, stealing, or selling drugs?	0 = Never
	1 = Once
	2 = Twice or More

*Note: Each delinquency scale was recoded into a dichotomous measure (0 or 1) indicating whether or not the youth had **ever** engaged in any of the behaviors over the last year, with the higher value indicating involvement.*

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