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I, Eurielle Kiki, hereby submit this original work as part of the requirements for the degree of Doctor of Philosophy in Criminal Justice.

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The Dual-status Dilemma: Understanding Treatment and Recidivism Outcomes for Youth with Maltreatment Histories in the Juvenile Justice System

Student's name: **Eurielle Kiki**

This work and its defense approved by:

Committee chair: Christina Campbell, Ph.D.

Committee member: Sandra Browning, Ph.D.

Committee member: J.Z. Bennett, Ph.D.

Committee member: Eyitayo OnifadePh.D, M.A, B.A.

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The Dual-status Dilemma: Understanding Treatment and Recidivism Outcomes for Youth with Maltreatment Histories in the Juvenile Justice System

A dissertation proposal submitted to the Graduate College of the University of Cincinnati

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Doctor of Philosophy

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by

Eurielle Kiki

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Dissertation Committee: Christina A. Campbell, University of Cincinnati (Chair)
Sandra Browning, University of Cincinnati
Juwan Bennet, University of Cincinnati
Eyitayo Onifade, Clark Atlanta University

Abstract

Risk and needs assessments' primary function is to predict future involvement in crime and delinquency with a degree of certainty higher than chance. With these tools, stakeholders in the juvenile justice system can categorize youth and match their needs with appropriate services in a standardized manner rather than relying on professional judgment. Past literature suggests that youth who are involved in both the child welfare and juvenile justice system are more likely to adopt nonnormative behaviors and engage in delinquency earlier and more frequently than their counterparts (Ryan et al., 2013; Morris & Freundlich, 2004). As such, these youth present a unique set of risks for recidivism and treatment needs. Few scholars have examined the utility of risk instruments in predicting recidivism for dual-status youth. Onifade and colleagues (2014) reported that the Youth Level of Service/Case Management Inventory (YLS/CMI), a widely used risk assessment tool, poorly predicted recidivism for dual-status youth. However, the dual-status population did have an increased risk of various criminogenic factors for reoffending such as peer association, family, leisure, personality, and attitudes. Another study using the Ohio Youth Assessment System-Disposition (OYAS-DIS) tool found that the tool equally predicted recidivism for dual-status youth and juvenile justice system-only youth. Similar to findings reported by Onifade and colleagues (2014), the authors found that the dual-status population was more likely to be younger and have higher risk scores. This population also had a larger proportion of female delinquents. Studies such as this suggest that more research is needed to understand better the challenges, nuances, and needs faced by youth caught in the intersection of these two realms. This dissertation will explore how child welfare history affects delinquent youths' risks, needs, and responses to intervention. The dissertation

will also review how ecological systems play a significant role in providing context for the similarities and differences between dual-status and juvenile justice system-only youth.

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INTRODUCTION

Several scholars have documented the prevalence of maltreatment history among youth in the juvenile justice system. While estimates may range, studies have found that, of youth involved in the juvenile justice system, approximately 90% have been exposed to a traumatic event, and 30% have reported injurious and frequent sexual and physical abuse (Sedlak & McPherson, 2010; Kim et al., 2021). Response to maltreatment can vary and has been found to lead to several adverse emotional and behavioral outcomes (Kim et al., 2021; Dierkhising et al., 2013; Bloom, 2002; Saar et al., 2015). These externalizing behaviors can include substance abuse, violence, and aggression – all of which could lead to involvement in the juvenile justice system (Kim et al., 2021; Ford et al., 2012; Dunnegan, 1997). This creates an unending cycle as these emotional and behavioral responses to maltreatment can turn delinquent, placing traumatized youth in the face of systems that are not well equipped to address their issues, sometimes making it worse and further aggravating their negative responses.

Studies have also shown that childhood maltreatment presents a substantial economic burden to taxpayers, states, and counties (Kim et al., 2021). The National Child Trauma Stress Network's website measured the cost of maltreatment via hospitalization, mental health care, child welfare systems, and law enforcement (2021). They found that in 2007, $70.7 billion was spent as a direct cost of child maltreatment. More recent statistics suggest the cost of childhood maltreatment in 2015 was $42 billion (Peterson et al., 2018). Despite the increasing presence of maltreated youth in the juvenile justice system and the costs associated with inadequate treatment, little research exists examining the risks, treatment needs, and recidivism outcomes of this unique population. Little is known about how experiencing

maltreatment affects the utility of different interventions for these youth. As such, the current study explores how maltreatment history influences a particular framework used in the juvenile justice setting to categorize and treat youth: the Risk, Need, and Responsivity model. This study will also highlight how ecological factors are relevant in unpacking the complex histories of youth involved in the juvenile justice system and youth involved in both the juvenile justice system and the child welfare system (referred to as dual-status youths for the remainder of the paper). The specific aims of this study include:

1. To explore the demographic and risk differences between dual-status youth and juvenile justice system-only youth.
2. To examine the ability of the OYAS-DIS tool's total score and domains to predict recidivism for dual-status and juvenile justice-only youth.
3. To examine the main effect of child welfare status on treatment outcomes.
4. To examine the moderating effect of treatment outcomes on child welfare status and recidivism.
5. To examine the differences in time at risk for dual-status and juvenile justice system-only youth.
6. To examine the effect of neglect status on recidivism for matched youths.

These aims are broken down to unpack the utility of the Risk, Need, and Responsivity model and Ecological Systems Theory in the context of the Ohio Youth Assessment System, which uses the models to assess maltreated youth. In doing this, the study has the potential to underscore the distinct differences between the dual-status group and the general delinquent population, challenging assumptions that findings from the latter can be universally applied.

LITERATURE REVIEW

Given the prevalence of maltreated youth in the juvenile justice system, the juvenile court is uniquely positioned to respond to maltreated and delinquent youth appropriately. With proper response to incidents and appropriate risk categorization, the court may be able to disrupt cycles of aggression and violence. Over the last several decades, essential tools have developed to classify and treat justice-involved youth. Risk assessments have replaced professional/clinical judgment and discretion to provide more uniform decision-making. While these tools have made significant strides in reducing discriminatory practices, they fail to adequately incorporate the role of maltreatment in predicting risk for future delinquent involvement and aligning effective strategies for the dual-status population. This is a significant barrier as decades of research have already documented the prevalence of maltreatment within justice-involved youth and how untreated issues connected to the maltreatment experience can cause long-term criminal involvement.

Youth involvement in juvenile justice and child welfare systems is not new. It is an unfortunate reality that has persisted since the start of both systems. Despite this, these systems rarely work together to identify these youths and provide them with a comprehensive and practical set of services that target their varying needs. Instead, the juvenile justice and child welfare systems are typically siloed and operate by managing distinct and clear boundaries around their missions and the services provided to their populations (Hertz et al., 2012). This results in several missed opportunities to provide holistic care that could prevent youths from continuing to penetrate both systems (Bogie and Ereth, 2015; Tam et al., 2016).

These types of consequences necessitate interventions to understand better how these systems can work together to interrupt the pathways for these youths.

History of the Juvenile Justice System

Historically, the juvenile justice system has intervened for children who were maltreated. The court assumed a parental role over delinquent youth and those needing support or services (i.e., incorrigible) (Caldwell, 1960). The origins of the juvenile justice system coincide with the Child Savers movement. Before the invention of the court, several social movements, court decisions, and philanthropic organizations worked to save children from what was perceived as harmful situations that could harm the trajectory of their lives (Feld, 2003; Platt, 1977). Specifically, impoverished youth were targeted, as crimes primarily occurred within socioeconomically disadvantaged families (Salerno, 2009). The Child Savers movement addressed several areas of a youth's life, including family problems, education, peers, and other relevant influences on delinquency (Platt, 1977).

During this time, delinquent youth were often referred to reform schools for extended periods without due process (Meng et al., 2013). In New York City, the first reformatory school, the Society for Reformation, was developed out of what was originally the Society for Prevention of Pauperism (Meng et al., 2013). By 1825, the Society opened the first House of Refuge," which was later mimicked in Boston and Philadelphia (Krisberg et al., 1993). Beyond providing guidance and discipline, these institutions aimed to isolate delinquents, so they were not corrupted by hardened and mature adult criminals (Meng et al., 2013). Before this, incapacitation was the primary method to detain troubled youth (Caldwell, 1960). Detainment and punishment were the primary responses to deviance. Youths also shared the same facilities

as adult offenders (Fox, 1996). Researchers and advocates began to argue the criminogenic nature of facilities and how mixing deviant youth and adults within the same space could create an environment for learning and reinforcing nonnormative behaviors and even developing skillsets needed to commit crimes (Fox, 1996). Public concern grew about the lack of effectiveness of mixing the two groups. The logic behind separating adult offenders from juvenile delinquents was to administer appropriate care and guide youth rather than punish and isolate them. As a call for change grew amongst advocates in the 19th century, a shift began from a punitive response to delinquent youth to a more rehabilitative one.

Characteristics of the Juvenile Court

The first juvenile court was created in 1899 in Cook County, Illinois (Mack, 1909; Caldwell, 1960). Several key features in juvenile court set it apart from the adult court system. In the juvenile court, rather than the adversarial trials that sought to answer questions of guilt or innocence that were evident in the adult system, judges considered the social background of children, their character, interpreted motivations and reasoning for delinquent actions to come to conclusions about the youths' outcomes (Steinberg, 2009). Here, we can also observe changes in terminology that further differentiated the new court system from the adult system. Words such as "guilt," "innocence," "trial," or "sentence" were replaced with "disposition" and "adjudication" (Wizner & Keller, 1977). The youth's best interest was the main point of interest rather than the offense itself. Juvenile courts also separated themselves by having a rehabilitative rather than punishment-oriented approach (Steinberg, 2009). As such, proceedings differed significantly in these courts. For example, rights such as rules of evidence and due process were viewed as unnecessary and possibly even harmful to assisting youth

(Meng et al., 2013). The court also relied on the expert opinion of others to determine amenability to treatment. Mental health professionals, probation officers, and social workers often play vital roles in final decision-making (Melton et al., 2017). Status offenses were also heavily adjudicated in the juvenile court. These offenses were illegal due to a person's age, such as consumption of alcoholic beverages, smoking cigarettes, truancy, etc. The court experienced rapid change that impacted the structure today.

The Juvenile Court Today

Since its inception, the juvenile court system has experienced monumental changes. By the late 1900s, the US Supreme Court began to disagree with the youth's lack of rights in defending themselves and thus responded. The result was several reformations that worked to address these issues. The Supreme Court ruled that, in most cases, youth should be afforded the same constitutional protection as adults facing criminal charges (Meng et al., 2013). As such, in the 1950s and 1960s, the Supreme Court began to pass some decisions that solidified the rights of juveniles, such as the right to have notice of petitions, the right to an attorney, and proof beyond a reasonable doubt (Meng et al., 2013). The notion of rehabilitation was still mainstream at this time. However, by the 1980s, we began to see the pendulum swing back towards punishment-oriented philosophies as the public began to regard the juvenile court system as too lenient due to the rise in juvenile crime (Meng et al., 2013). By the 1990s, as the "tough on crime" era emerged, several punitive laws were passed in response to this. Many states adopted mandatory sentencing laws, blanket transfers to the adult system for certain crimes (Mears & Cochran, 2014; Sridharan et al., 2004), and the inclusion of the death penalty for serious crimes (Fagan, 2010; Steinberg & Scott, 2003; Steinberg, 2009). More recently,

juvenile justice reforms have reduced the severity of the laws passed during the “Get Tough” movement and slowly readjust the pendulum to the rehabilitative approach it once had (Singh et al., 2021). However, many still hold polarizing views on how to address youth delinquency today.

History of the Child Welfare System

The child welfare system has developed throughout American history in line with shifting opinions on the role of government in providing aid and protection for maltreated children. Early efforts to intervene on behalf of children needing care were more concerned with fulfilling their immediate physical needs than with the detrimental, long-term effects of abuse on children's development (Murray & Gesiriech, 2004). Government officials paid more attention to the significance of child protection as public awareness of child abuse and the harm it caused increased.

Several institutions, including the family and the state, played vital roles in developing and understanding child welfare (Sarri & Finn, 1992). The family has historically been a dominant system at the center of conversations about child welfare. A mixture of statues and overall perceptions/beliefs about tradition work together to enforce responsibility on families for the sustenance and socialization of youth (Sarri & Finn, 1992). The state is the formal, legitimatized public system encompassing policies, statutes, and agencies with a legal responsibility to act in the children's best interest (Sarri & Finn, 1992). How these two institutions interact and are intimately linked defines the space in which child welfare policy and practice are enforced.

Advocates declared the twentieth century the “Century of the child” (Sarri & Finn, 1992). The well-being of children became the primary subject of national conferences, and the work of child welfare was professionalized. The development of the separate juvenile justice system allowed the state to formally make decisions that significantly affected children and families via the concept of parens patriae (Levin & Sarri, 1974). During this period, stakeholders in social welfare also advocated for the well-being of urban children by encouraging child labor laws, increasing public education, public health measures, and more (Sarri & Finn, 1992). While on the surface, these reforms served to improve child well-being, they also benefitted from establishing social control (Ehrenreich, 1987; Platt, 1969). Despite rhetoric about family preservation during the progressive era, out-of-home placement continued to increase (Abramowitz, 1988). This suggested the focus was more on control, particularly of children of color, as early reports indicated that Black youth and immigrant children were significantly overrepresented in out-of-home placement (Bureau of the Census, 1927, 1935; Lerman, 1990).

Early social service programs that addressed educational and employment needs helped shape the “at risk” youth concept, which remains prominent in rhetoric today in developing policies and practices (Sarri & Finn, 1992). These programs were in the form of federal grants-in-aid that subsequently implicated states in the responsibility of children and families. This also invited considerable discretion within the state that still exists today in child welfare. Amendments to the Social Security Act of 1962 also broadened the services of the child welfare system (Sarri & Finn, 1992). Social workers underwent training in the child welfare system. However, training mostly centered on professionalism and maintaining traditional practices and structure (Sarri & Finn, 1992). Similar to the juvenile justice system, approaches for addressing

at-risk youth varied from more or less punitive policies and practices. The 1980s were plagued with federal cutbacks that burdened local and state governments, and the result was often a loss of benefits and services to families that needed them the most.

The Child Welfare System Today

As was the case from the onset of the child welfare system over 150 years ago, children of color continue to represent most children in the child welfare system (Cenat et al., 2021). The number of children in placement also continues to rise over time. Impoverished children are also overrepresented in the group identified as abused, neglected, and delinquent (Cenat et al., 2021). Child welfare workers are consistently overburdened by a system driven by concerns for liability and social control (Fluke et al., 2016). Today, child protective services include several specialized interventions that dominate the child welfare system (Kammer & Kahn, 1990), including support, prosecution, accountability, treatment, and social control tasks. The language of family preservation remains at the center of child welfare. At the same time, the practice of removal and placement to foster care, hospitals, or residential treatment adds to the transinsitutionalization of youth (Weithom, 1988).

Adverse Childhood Experiences Among Youth

Trauma is a broad term encompassing several experiences, such as traumatic exposure (e.g., abuse or witnessing violence) and trauma-induced reactions (e.g., PTSD symptoms). Child maltreatment, the focus of this study, is an act carried out by a caregiver that results in potential threats or actual harm to a child (Leeb, 2008). This act can occur once or repeatedly. This type of trauma is prevalent globally and is of significant public health concern (Afifi et al., 2016; Widom et al., 2007). People who are maltreated often exhibit considerable behavioral,

cognitive, and emotional difficulties (McPhie et al., 2014; Paul, 2015). Although recent years have seen a decline in rates of child maltreatment, in the United States, over 600,000 children have had substantiated cases of abuse or neglect (Jaffee, 2017). Meaning there was enough evidence to find that these youths were maltreatment victims at their caregivers' hands.

Early positive relationships and experiences heavily shape children and their outcomes. Creating stable, safe, and nurturing environments that encourage early brain development and long-term success is imperative. Alternatively, children are also shaped by early negative experiences. These negative encounters are known as Adverse Childhood Experiences (ACEs). Substantial evidence supports the relationship between conditions of childhood adversity and a higher risk of adverse outcomes over time (Hughes et al., 2017; Brown et al., 2009).

The ten indicators of ACEs consist of direct child maltreatment (neglect and abuse) and other negative familial and household circumstances or experiences (Felitti et al., 1998). These experiences can include witnessing domestic violence, substance abuse, mental illness, divorce, or having a household member in prison. There is a high prevalence of these experiences today. One study found that almost half of children in the United States have reported experiencing these events (Sacks et al., 2014). Two significant themes developed from this scholarship: ACEs are highly interlinked (Jones et al., 2023). In other words, exposure to one event is significantly associated with the likelihood of exposure to another. Second, there is evidence of a dosage response or “graded” association between adverse childhood events and negative life outcomes. Experiencing an increasing number of ACEs also incrementally raises the likelihood of facing adverse mental, physical, and behavioral outcomes in later adolescence and adulthood (Dong et al., 2004; Felitti et al., 1998).

Moreover, the increased risk of engaging in delinquency for youths who experience ACEs exists even after controlling for other risk factors (Baglivio et al., 2015). When considering the well-established link between maltreatment and criminal offending, it thus makes sense to conceptualize maltreatment as a risk factor, as a treatment need factor, and finally, a factor that effects an individual's ability to engage and respond to treatment (Fritzon et al., 2021; Holloway et al., 2018). A more in-depth look at this exposes how maltreatment can create several pathways to offending and highlights how these pathways coincide with the risk factors currently viewed as criminogenic (Fritzon et al., 2021).

Prevalence of Maltreated Youth in Juvenile Court

Several scholars have noted the impacts of childhood adversity and maltreatment on the likelihood of delinquency (Campbell et al., 2016; Baglivio, Wolff, Piquero, & Epps, 2015; Barrett, Katsiyannis, Zhang, & Zhang, 2014a, 2014b; Teague et al., 2008; Maxfield & Widom, 1996). Indeed, DeLisi and colleagues (2011) implicated traumatic childhood experiences, including sexual, physical, and emotional abuse and poverty, as risks for delinquency. The juvenile court regularly encounters child welfare youth who have suffered extreme maltreatment and abuse. These vulnerable youth typically lash out and engage in behaviors that can lead to adjudication. A link appears between maltreatment, lack of appropriate treatment/intervention, and involvement in delinquency (Simkins, S. & Katz, S., 2002). For example, Wood and colleagues (2002) compared justice-involved youth with those in the community and found that delinquent youth were significantly more likely to experience sexual abuse and community violence. In an extensive study of 18,676 youth, Ryan and Testa (2005) reported that delinquency amongst victims with substantiated cases in the child welfare system

was 47% higher compared to youth who did not experience maltreatment. Maltreated youth are also more likely to engage in delinquency at a younger age (Lemmon, 1999; Ryan et al., 2007), engage in violent crimes (Kelley et al., 1997; Widom & Maxfield, 2001), and offend as adults (Fagan, 2005; Mersky & Topitzes, 2010). To build a collaborative, integrated system, it is first necessary to understand who these systems are treating, what they look like, and their pathways. This will also give more insight into the risk-recidivism relationship for maltreated youth.

Demographic Characteristics of Maltreated Youth in the Juvenile Justice System

Maltreated youth face a higher chance of being involved in the juvenile court during adolescence than their non-maltreated counterparts, at a 47% increased risk (Halemba and Siegel, 2011; Morris & Freundlich, 2004). This can be attributed, in part, to their earlier onset of delinquent behaviors compared to their peers (Rivera & Widom, 1990). Consequently, these maltreated youth commit almost twice as many delinquent acts and are more prone to incarceration as adults (English et al., 2004). Although findings vary on the average age of dual-status youths at first contact with the court, several authors have reported that these youths are 15 to 16 years old when they experience their first arrest (Herz et al., 2019). Further, one study found that youth arrested earlier in life had higher ACEs than those who engaged in delinquency later. These higher scores were also associated with an increased likelihood of getting arrested from childhood through late adolescence (Baglivio et al., 2015). In other words, youths who had more traumatic experiences engaged in delinquency earlier and more frequently. Dual-status youths are also more likely to be detained than those solely involved in the juvenile justice system (Bender, 2010). Another study reported significant disparities in

arrests for violent crimes for adults and adolescents who experienced maltreatment as children (English et al. (2004). Given their heightened risk for engaging in delinquency, research also suggests that dual-status youth exhibit higher recidivism rates than their non-maltreated peers (Chang, Chen, & Brownson, 2003; Herz et al., 2010).

There is an overrepresentation of African-American youth in both the juvenile justice and child welfare systems. While Black youth only comprise 16% of the general United States population (Puzzanchera et al., 2016), they represent 34% of youth who are arrested and 35% of the total number of delinquency petitions in the juvenile court (Sickmund et al., 2017). In the child welfare system, child protective services (CPS) reports that Black youth account for 23% of maltreated youth and 24% of those placed in foster care (Child Welfare Information Gateway 2016). Several studies that measure the volume of Black kids in both systems in the United States have reported even higher numbers (Herz et al., 2019). Even more so, the amount of African American youth involved in both systems, compared to one, has more than doubled in states like Washington (Pickard, 2014), Arizona (Halemba et al., 2004), and in several counties in Illinois (Ryan et al., 2011).

Studies have found that dual-status youths tend to be male; however, the proportion of females involved in both systems has increased over time (Herz et al., 2019). While females are 51% of the general population, they account for about 28% of all delinquency petitions presented to juvenile courts nationwide and about 29% of juvenile arrests (Sickmund et al. 2017). The Child Welfare Information Gateway (2017) reported that girls comprise 51% of maltreated victims and 48% of youth in foster care. When considering the intersection of race and gender, we are more likely to see more females in dual-system populations (Herz et al.,

2019). African American girls have higher prevalence rates and make up a more significant portion of dual-status girls than Latina and White girls (Ryan et al., 2011). Scholars have also reported findings that suggest variation in types of maltreatment experienced across gender categories. For example, Wasserman and colleagues (2015) sampled delinquent boys and girls. They found that of female detainees, 25.9% reported experiencing sexual abuse, compared to 5.7% of male detainees. Alternatively, boys were twice as likely to have experienced threats with a weapon (43.3%) compared to girls (21.8%). Research has also found that girls are more likely to experience poly victimization, meaning they are more likely than their male counterparts to be exposed to several traumatic experiences (Ford, Grasso, Hawke, & Chapman, 2013).

Youth Responses to Maltreatment

Youths who experience trauma due to maltreatment may not receive the needed treatment. There are several consequences to these unresolved issues including, but not limited to, mental health issues, substance abuse, and delinquency (Capusan et al., 2021; Lansford et al., 2010; Rogosch et al., 2010; Levenson & Grady, 2016; Saar et al., 2015). Several of these outcomes are often the result of compromised decision-making abilities. The following sections will review the effects of maltreatment on these outcomes for youth.

Maltreatment Consequence: Mental Health and Substance Abuse

A history of child maltreatment has increased risks for several mental health problems, such as post-traumatic stress disorder, anxiety, suicidal thoughts, and depression (Tottenham, 2015; Miller, 2016). Exposure to maltreatment accounts for 45% of mental health issues in childhood, 32% in adolescence, 29% in early adulthood, and 26% in later adulthood (Green et

al., 2010). Furthermore, a documented relationship exists between the frequency and duration of maltreatment exposure and co-occurring mental health problems (Sabri, 2011). Maltreated youth may be more exposed to other environmental and genetic risk factors for mental health, which would confound the previous association (Baldwin et al., 2023). For example, studies have shown that maltreated youth are likely to be a part of families with histories of mental health conditions (Sidebotham & Golding, 2001). These youths are also likely to be exposed to environmental risks for mental illness, such as socioeconomic disadvantage (Baldwin et al., 2022).

Research also indicates that child maltreatment is a risk factor for alcohol abuse (Brems, Johnson, Neal, & Freemon, 2004; MacMillan et al., 2001; Widom & Hiller-Sturmhofel, 2001). One study found that, of the sample that experienced abuse, 31.8% of arrested youth had a mental health diagnosis, and 27.7% had a substance abuse diagnosis (Magee et al., 2021). One meta-analysis reviewed the relationship between different types of maltreatment (neglect, sexual and physical abuse, emotional maltreatment, and witnessing domestic violence) and substance use/abuse (alcohol, nicotine, and a variation of drugs) (Tonmyr et al., 2010). The authors found that most studies reported an association between maltreatment exposure and increased risk for substance use/abuse in youth. More severe forms of physical abuse were found to have a stronger relationship with substance use (Fergusson et al., 1996; Lau et al., 2003). Another notable finding was that youths who experienced any maltreatment measured in the study were more likely to start using and abusing substances earlier (Champion et al., 2004; Clark et al., 2004; Clark et al., 2005; Hamburger et al., 2008), which was consistent with clinical samples (Tonmyr et al., 2010). There are several possible explanations for the findings

reported. Some authors hypothesized that drugs and alcohol were used to get relief from maltreatment and forget the existing issues by experiencing feelings of relaxation and power (Yen et al., 2008; Simantov et al., 2000).

Maltreatment Consequence: Delinquency

Decades of research have exposed the relationship between experiencing maltreatment and engaging in juvenile delinquency (Abram et al., 2004; 2010; Saar et al., 2015). While maltreatment can result in several negative behavioral, psychological, and emotional outcomes (McGloin & Windom, 2001), research on the cycle of violence theory (Smith & Thornberry, 1995; Widom, 1992) postulates that youth who have been exposed to maltreatment earlier in childhood have a higher risk of engaging in delinquency and being involved in the juvenile justice system (Becker & Kerig, 2011; Bennett & Kerig, 2014; Evans & Burton, 2013; Kerig & Bennett, 2013). Youths who witness violence in their communities and schools are at risk for aggressive behavior and system involvement (Copeland-Linder et al., 2010; Flannery et al., 2004; Flannery et al., 2007). Furthermore, epidemiological studies have reported that, compared to the general youth population, justice-involved youths have 2 to 3 times higher maltreatment histories (Coleman, 2005; Coleman & Stewart, 2010; Ford, Chapman, Connor, & Cruise, 2012). Research findings suggest analogous rates of heightened trauma history among youths that are detained relative to counterparts; roughly 90% of detained youth self-reported experiencing at least one traumatic event (Abram et al., 2004). Additionally, 35% of detained youths indicated that at least one was physical assault (Ford, Hawke, & Chapman, 2010). Theories on the association between maltreatment history and juvenile justice involvement hypothesize that maltreated youth have disorganized attachment styles, which can lead to

emotional or aggressive reactions to situations (Lyons-Ruth, 1996; Smith et al., 2006). One study reported that boys who reported experiencing several types of maltreatment, including neglect, abuse, and community violence, exhibit more aggressive behaviors, use substances, and are delinquent (Copeland-Linder et al., 2010). Other studies have found that girls who experience sexual and physical assault and community violence are at higher risk for associating with deviant peers, contact with the juvenile justice system through truancy and status offenses, and substance use (Anderson et al., 2019; Seth et al., 2017; Saar et al., 2015).

Juvenile Justice Processing of Maltreated Youth

Research surrounding juvenile justice processing focuses on various issues, such as the effects of socioeconomic status, race, and gender on decision-making, including disposition and detention (Modrowski et al., 2021). Studies have even investigated cross-national comparisons to understand better how processing decisions can affect later offending patterns (Huizinga, Schumann, Ehret, & Elliott, 2004). Minimal research investigates how maltreated youth are processed in the juvenile justice system. Additionally, there is a lack of uniformity in procedures for handling these cases. As such, courts must rely on programs and policies primarily based on anecdotal evidence, professional judgment, and research on general delinquency (Modrowski et al., 2021). However, youth involved in both the child welfare and juvenile justice systems present a unique set of situations and circumstances that general delinquents may not face, for instance, potential family and safety issues that may need to be addressed simultaneously with the youth's disposition outcome. Issues such as this highlight how findings from general delinquent populations may not apply to this specialized population. For example, Snyder and Sickmund (2006) found that 60% of first-time delinquents were given probation, which is a

disposition that may not be best suited for youth who are also involved in the child welfare system. Youths in foster homes may find themselves with families unwilling to deal with a delinquency case, especially if there is concern about how it may affect other children. These circumstances may limit the options available to a court, potentially leading to more secure and severe sanctions (Modrowski et al., 2021).

Processes for handling youths involved in these two systems vary significantly across states and result in a host of complex case management, legal, and jurisdictional issues (Siegel & Lord, 2005). One study reviewed state practices for these cases and found that several states adopted a concurrent jurisdiction approach (Herz 2006). In this approach, both agencies remain involved throughout a child's case; however, one agency would assume a "lead agency" role. States also rely on other approaches, such as "on hold," by which a child welfare case is suspended and later reexamined. At the same time, the focus is directed to the delinquent case. Little is known regarding which model is best and most effective in reoccurrence of delinquency and maltreatment. However, it is rare for the systems to work together to provide comprehensive services that target the youths' varying risks and needs.

One Vera Institute of Justice study suggests that a lack of communication between the two jurisdictions may harm youth (Conger & Ross, 2001). They found that foster youth who did not have prior arrests were more likely to be detained, and the absence of communication partially explained this finding. After the juvenile court involvement, frontline workers were unaware of the youth's involvement in different social service agencies. Additionally, even if correctional staff were aware of the youth's involvement in the child welfare system, they often

did not know who to contact. These youth often found themselves in secure detention without a legal guardian or adequate representation.

Juvenile Justice Responses to Maltreated Youth

A few studies have examined how maltreated youth are treated once they become involved with the juvenile justice system. The few authors investigating this have reported that after committing their initial offense, these youth are less likely to receive probation or be referred to a diversion program than those without a maltreatment history (Ryan et al., 2007, 2008). Instead, they are placed in detention or correctional facilities (Ryan et al., 2007; Utah Juvenile Justice Working Group, 2016). One study that examined whether a child welfare bias existed for maltreated, delinquent youth in court processing detected bias at the sanction decision-making point (Modrowski et al., 2021). Specifically, after controlling for several factors such as race, gender, age, and type of offense, maltreated youth were less likely to be given probation and more likely to be placed in group homes or other residential settings. This finding is problematic as residential programs are less effective in reducing recidivism than community-based programs. There is very little research and, ultimately, understanding of how or if these programs address child safety or family violence (Modrowski et al., 2021).

Furthermore, youth with a maltreatment history stay in custody longer than their counterparts (Utah Juvenile Justice Working Group, 2016). These outcomes have increased deviant peer association and reinforced antisocial attitudes (Dodge et al., 2006). Another qualitative study echoed these findings. Flores and colleagues (2018) sampled 33 girls involved in the child welfare and juvenile justice system. They found that these girls perceived their maltreatment status to be linked to their increased time in detention and their differential

treatment by staff. These girls reported having fewer privileges than the other girls in detention who did not have a history of child welfare involvement. They also reported facing harsher punishments for otherwise minor infractions than other detained girls. Several scholars suggest state-specific statutes could explain why maltreated youth receive different treatment within the juvenile justice system (Modrowski et al., 2021). For example, certain states mandate policies within the child welfare system related to reporting specific infractions at group homes to police (Modrowski et al., 2021). Additionally, strained relationships between families and child welfare staff, systemic bias, as opposed to individual behaviors and attributes, could also result in differential treatment for maltreated youth in the juvenile justice system (e.g., Garcia et al., 2015; Marshall & Haight, 2014; Herz et al., 2010; Krinsky, 2010). While these studies help understand specific types of outcomes (i.e., dispositions) for this population, more research is needed to understand how these treatments work for this population long term and alternatives that may be more effective in reducing their chances of engaging in future delinquency.

Trauma Informed Care

Despite the well-documented link between maltreatment exposure and delinquency (Abram et al., 2004; Ko et al., 2008), the juvenile justice system has historically ignored this link in the delivery of services (Donisch, Bray, & Gewirtz, 2016). In order to ensure the needs of youth are effectively addressed to improve their outcomes in the system, it is vital to recognize and provide treatment that targets maltreatment symptoms (Ko et al., 2008). More recently, there has been considerable attention to the standardization of trauma-informed care framework in settings that treat youth, including the juvenile justice system (Donisch et al.,

2016; Ko et al., 2008). This approach is conceptualized as an organizational-level process that promotes healing and reduces the risks associated with re-traumatizing vulnerable people, including those under correctional supervision (Wolf et al., 2013). While there is some debate around defining trauma-inform care, certain elements are agreed upon, such as appropriate screen for traumatic experiences and exposure, assessments on how these experiences impact individuals, and overall increases in the use of mental health treatment for people who have experienced trauma (Berliner & Kolko, 2016). These characteristics can also help address unresolved needs resulting from early childhood exposure to trauma (Cohen et al., 2006).

The current research on risk factors associated with youth who are involved in both the child welfare and juvenile justice systems has a significant limitation: it does not adequately account for the potential impact of trauma exposure, such as maltreatment, and the potential posttraumatic consequences and dysregulation, on the dual involvement trajectories of these youth. There is little understanding and assessment of how ecological factors impact dual-status youth. At the same time, some studies have examined child welfare-specific factors, including the type of maltreatment the youth was exposed to and the timing of involvement (Malvaso et al., 2016), while others have focused on a combination of risk factors that work together to result in an increased chance of juvenile justice involvement (Van Wert et al., 2017; Vidal et al., 2017). However, very few studies have incorporated developmental, trauma-informed theory that could help elucidate the underlying developmental processes affected by childhood maltreatment, which might contribute to the crossover experience (Modrowski et al., 2021). Unfortunately, such a limitation exists. Regardless of how youth become dually involved in the child welfare and juvenile justice system, the experience of childhood

maltreatment is a salient feature shared by many youths. As we better understand the underlying processes that result in varying trajectories for dual-status youths, we will be better equipped to develop effective treatments and interventions that address the exposure to maltreatment and the subsequent risks of offending or reoffending.

Theoretical Framework

The premise behind the Risk, Need, and Responsivity model in criminal justice is that to reduce someone's chances of reoffending, we must be able to determine that offender's risk level. We must also consider factors affecting the offender's ability to respond to different treatment when pairing their needs with appropriate services (Bonta & Andrews, 2017). The model has effectively assessed and classified offender rehabilitation for various offender groups (see meta-analyses by Andrews et al., 1990; Hanson et al., 2009). The RNR framework relies on four primary elements to determine targets, types, and degrees of rehabilitative effort (Andrews et al., 1990).

1) Risk of Recidivism
    a. This principle emphasizes correctly identifying each offender's reoffending risk (Bonta & Andrews, 2007). Using appropriate risk determinations, researchers and practitioners can classify offenders into low-, medium-, and high-risk groups. The risk principle also states that those at the highest risk of recidivism should be given the most attention and resources. In contrast, those at lower risk should receive fewer resources allocated to them (Andrews et al., 1990). In directing services and treatment to those who exhibit the most change, as opposed to those less likely to reoffend in the

first place, the risk principle suggests that this will lead to a significant reduction in recidivism.

2) Criminogenic Needs

    a. The need principle considers that people have a wide range of deficiencies; however, it is essential to determine which should be focused on for intervention and where resources should be devoted (Andrews, Bonta, 2010a). This principle differentiates between static and dynamic needs, stressing the weight of criminogenic needs when designing interventions that lead to reduced recidivism risk. An example of a non-criminogenic need could be self-esteem. Many offenders may report lower self-esteem; however, interventions targeting self-esteem alone may not be as effective in reducing recidivism (Andrews & Dowden, 2007). There are eight domains included within criminogenic needs: antisocial personality, history of antisocial behavior, deviant attitudes, deviant associates, substance abuse, factors related to family/marital, school/work, and leisure/recreation domains (Andrews, Bonta, & Wormith, 2011).

3) Offender Responsivity

    a. The responsivity principle recognizes that treatments will have varying impacts on people based on their strengths and weaknesses (Dowden & Andrews, 1999). In order to reduce recidivism, this component stresses the difference between general responsivity and specific responsivity. General responsivity refers to the importance of providing services and treatment

options that have shown to be generally effective in reducing recidivism, such as cognitive behavioral therapy. In contrast, specific responsivity refers to matching offender characteristics to their chosen treatment. Offender characteristics can include demographic characteristics and other factors affecting their ability or motivation to participate in treatments (Andrews & Bonta, 2010a). Adherence to this principle requires sound clinical practices to understand treatments and established empirical evidence supporting these interventions on different offenders.

Since the model was initially proposed, a few scholars have proposed additional principles to refine and enhance the original model. These contributions include non-criminogenic risk factors, assessments of the comprehensiveness of RNR factors, inclusion of professional discretion, and so on (Jeglic & Calkins, 2018; Bonta & Andrews, 2007). Current principles incorporate relevant service and program delivery factors, including offender and staff relationships and treatment dosage (Baglivio et al., 2021). Finally, community factors have been added. This addition emphasizes the importance of continuous care and the use of the RNR model for mediating risk and continuously promoting prosocial behaviors (Bonta & Andrews, 2007).

RNR Model in Juvenile Justice

While the RNR model was initially designed for adult offenders, its effectiveness in identifying appropriate treatments for criminogenic needs implies that it could also be effectively utilized in the juvenile justice system. This is particularly relevant considering the system's focus on rehabilitation and the potential for positive adolescent change (Redding et

al., 2005). Furthermore, early research on the RNR model, which investigated the impact of RNR principles on reducing reoffending rates, also reviewed its utility on the juvenile population (e.g., Andrews et al., 1990). The most relevant research conducted on this group has predominantly emphasized using risk assessments in predicting recidivism while paying less attention to examining the comprehensive application of the RNR model (Singh et al., 2014). Nevertheless, a meta-analysis conducted within the context of juvenile justice reported a robust and positive correlation between adhering to the RNR principles and reduced reoffending for delinquent youth. Specifically, when criminogenic needs are addressed, there is a notable reduction in recidivism rates (Dowden & Andrews, 2003).

Risk Principle in the Juvenile Setting

A substantial body of research within juvenile justice settings has concentrated on the risk principle. Evidence suggests that when risk assessments are utilized, determinants of risk level affect the following decisions about services and interventions, particularly in the probation setting (Luong & Wormith, 2011). These findings coincide with the RNR principles, which emphasize matching interventions to the identified risk factors (Luong & Wormith, 2011). In a quasi-experimental study, Vincent and colleagues (2012) found that intensive interventions were significantly reduced for justice-involved youth where risk assessment was implemented before disposition decision. The authors noted that this shift also did not result in any increase in recidivism. Furthermore, considerable evidence indicates that the most significant reductions in recidivism through treatment are observed among youth with the highest risk levels (Lipsey, 2009). This finding underscores the practical importance of the risk principle in effectively addressing juvenile delinquency in practice.

Need Principle in the Juvenile Setting

Furthermore, research has been conducted on the needs principle in juvenile justice. For example, one meta-analysis investigated the specific areas that represent criminogenic needs in youth. These include social factors such as involvement with delinquent peers, family factors, behavioral problems, leisure time activities, and non-severe psychological issues like stress and anxiety (Cottle et al., 2001). Vieira and colleagues (2009) observed that juveniles under probation had various needs in domains such as peer relationships, employment, education, substance use, family, personality, anger management, and antisocial attitudes, leisure time. Addressing these needs resulted in a significant reduction in future delinquent behavior.

Responsivity Principle in the Juvenile Setting

Very few studies have reviewed the validity of the responsivity principle alone for the juvenile population. This presents a significant knowledge gap regarding the RNR model's application in this setting. A study by Vieira and colleagues (2009) discovered that selecting treatments based on responsivity factors did not significantly decrease recidivism. They suggested that this lack of effectiveness may be attributed to the challenge of distinguishing between factors related to needs and factors related to responsivity. Even in cases where it is feasible to identify appropriate matches for a single juvenile and an intervention, stakeholders often fail to consider this information when making treatment decisions. This limitation hinders the implementation of the responsivity principle in juvenile justice settings. It poses a significant barrier for justice-involved youth (Jones & Wyant, 2007).

Lipsey and his colleagues have conducted extensive research identifying factors associated with effective treatment and interventions for youth in the justice system and

translating those findings into practical applications (Lipsey, 2009, 2014; Lipsey et al., 2010). Their work highlights the importance of various factors in intervention programs. For instance, a meta-analysis of 548 studies revealed that programs in the juvenile justice system that emphasized discipline were less successful in decreasing recidivism than those that did not prioritize discipline (Lipsey, 2009). Programs focusing on deterrence and discipline increased recidivism rates. In contrast, interventions focused on surveillance showed some reduction, albeit less effective than programs with a therapeutic approach (Lipsey et al., 2010). Interventions such as counseling, skill building, multiple services, and restorative approaches yielded average reductions in recidivism, ranging from 10% to 13% (Lipsey, 2009). It is essential to acknowledge that these different interventions are broad and do not account for the level of compatibility between individual adolescents and the specific treatment they receive (Brogan et al., 2015). Moreover, it is worth noting that these interventions can only be effective if an adequate "dose" of treatment is provided to youth. This means juveniles must receive appropriate service days and contact hours to ensure that the intervention effectively reduces recidivism (Lipsey et al., 2010).

Maltreatment and the Risk Principle

Exposure to maltreatment can be viewed as a determinant of risk, as it can lead to prolonged involvement in delinquency. One study found that exposure to multiple types of victimization predicted self-reported offending behaviors for youth in the juvenile justice system (Ford et al., 2010). Consistent with this, one longitudinal study reported that youth who experience multiple ACEs were at an increased risk for engaging in delinquent activities, even after accounting for several static and dynamic risk factors (Baglivio et al., 2015). Justice-

involved youth who had experienced severe instances of maltreatment were reported to be 345% more likely to have earlier onset delinquency trajectories and also had higher prevalence rates throughout adolescence into adulthood (Baglivio et al., 2015). Even more so, Romaine and colleagues (2010) conducted a retrospective record review where they investigated how maltreated-related information was used to determine outcomes for youths in criminal court. The authors found that 71% of sampled youth were potentially exposed to these negative experiences. These youths were more likely to have prior arrests, be involved with the court longer, and have more out-of-home placements than youth who did not report experiencing a traumatic event. The findings of these studies suggest that exposure to maltreatment is a risk to offending and reoffending patterns. The risk principle finds that risk determinations must be made to understand someone's risk of reoffending and that more treatment should be allocated to those at higher risk. As prior research has heavily reinforced, the experience of maltreatment can be a factor that results in outward expressions of delinquent behaviors. Whether this model adequately corresponds to the needs of dual-status youths will be explored next.

Maltreatment and the Need Principle

The need principle finds that the most significant reduction in recidivism is associated with providing individuals with treatment and interventions that target their risk factors (Bonta & Andrews, 2017). When case management is not appropriately tailored to an individual's needs, it could lead to adverse outcomes. As prior studies have shown, delinquent youth with maltreatment histories are more likely to exhibit more criminogenic risk factors; thus, using this model, these youths are also likely to score higher on an assessment tool. The problem,

however, is using the RNR model as the foundation; these youths should also have increased supervision and more intensive services. When youth have been inadequately assessed, and maltreatment exposure or its effects on youth are not considered, they may become overburdened, and treatment may not be effective. If these youth receive more treatment than juveniles without treatment exposure, this treatment must address all their needs concurrently.

Increasingly, research emphasizes the significance of developing integrated and comprehensive approaches to enhance outcomes for dual-status youth (e.g., Cusick, Goerge, & Bell, 2009; Munson & Freundlich, 2005). These approaches often involve collaborations among various systems, including child welfare, juvenile justice, law enforcement, behavioral health, education, and court staff (Haight et al., 2016). By working together, these collaborations can minimize unnecessary outcomes such as detention for foster youth who received petitions or are arrested for minor offenses (e.g., Conger & Ross, 2006) and also address complex needs for dual-status youth more effectively through coordinated supervision and case planning (e.g., Herz & Ryan, 2008; Nash & Bilchik, 2009; Siegel & Lord, 2005; Wiig & Tuell,2013). Unfortunately, treatments and services provided to dual-status youth and their families are typically fragmented, with different child-serving systems operating independently, each with its intricacies, terminology, expectations, and occasionally conflicting approaches to youth (Stewart et al., 2010). The following section will consider how this level of intensity affects their responses to treatment.

Maltreatment and the Responsivity Principle

Youth exposed to maltreatment are more likely to be impulsive and constantly alert to their environment (Griffin et al., 2012; Rapp, 2016). This is likely due to findings that suggest

adolescents with high rates of maltreatment exposure are also more likely to meet the criteria for post-traumatic stress disorder (PTSD) (Dierkhising et al., 2013; Griffin et al., 2012; The National Child Traumatic Stress Network (n.d.)). Trauma-informed care would suggest that these youths also have unique responses to treatment. It has been proposed that ineffective programs that unintentionally adopt punitive measures to respond to delinquency may be similar to youth's earlier adverse childhood experiences, leading to poorer outcomes such as subsequent delinquency (Mohr et al., 2009; Dierkhising et al., 2014; Lambie & Randel, 2013; Ravoira et al., 2012). Particularly for residential treatment, these youths may experience psychological abuse, physical altercations with other youths, and excessive force, leading to coercive interactions between staff and youth (Gillen, 2012) as they react to settings that retraumatize.

The RNR model suggests that factors that affect an individual's ability to respond positively to treatment, such as cognitive abilities and learning styles, should inform approaches to delivery (Yates et al., 2010). Using this as a basis for our understanding, it follows that maltreatment and how it affects individuals should be considered when determining an individual's amenability to treatment options. When delinquent youths who have experienced maltreatment are the reference point for dissecting the RNR model, the principles become blurry. Assessment tools based on this model alone would likely show that these youths pose a high risk for recidivism, meaning they need more intensive services compared to youth at lower risk for recidivism. This is then used to provide these youths with intensive supervision and service. It remains in question how well this model applies to maltreated youth. Do these assessments target the core issues faced by this population? Is there a need to incorporate

another layer of examination explicitly related to their maltreatment experiences to understand needs and responsivity? Can we get better responses to treatment if we understand the role of maltreatment in a youth's life better? These questions need further examination to understand how useful the RNR model is for this special population.

Thinking Beyond the RNR Model

The RNR model is a useful framework for understanding and evaluating youth. This model focuses on identifying the specific risk factors relevant to the needs of a justice-involved individual and tailoring interventions to address those factors. The RNR model emphasizes the importance of matching the level of intervention to the level of risk and using evidence-based practices responsive to the individual's needs. This approach aims to reduce the likelihood of reoffending by addressing the underlying factors contributing to criminal behavior. This model is specific to criminogenic determinants of risks and needs. However, risk, needs, and responsivity are complex and multifaceted. Individuals can have similar experiences, but how they internalize these situations and how they affect behavior can vary. Other criminology and related sciences models can help better understand and frame experiences.

Ecological Systems Theory

Delinquent youth often have complex psychosocial needs influenced by ecological conditions and social determinants of health (Abram et al., 2015; Harrison et al., 2020; Bernburg et al., 2006; Wylie & Rufino, 2018). Social determinants of health refer to specific environmental factors that impact individuals' quality of life, considering socioeconomic conditions such as poverty, access to food, and neighborhood safety (Centers for Disease Control and Prevention [CDC], 2022). Youth in the juvenile justice system face challenges

related to social determinants of health and frequently interact with multiple systems of control and care, including the child welfare and behavioral health systems (Lee, 2016; Harrison et al., 2020). To navigate the intricacy of their needs and understand the interplay of ecological factors and multiple system involvement, stakeholders can employ the foundations of Urie Bronfenbrenner's Ecological Systems Theory (EST, 1979). This theory provides a framework to guide interventions and address the needs of juvenile justice-involved youth across different levels of ecological systems.

Ecological Systems Theory (see Figure 1) posits that human development is shaped by the dynamic interactions between individuals and their environment, resulting in a person-process-context synergy that influences their development. This theory recognizes that individuals engage with varying subsystems within their environment, ranging from the home and school to broader interactions within cultural, societal, and social contexts (Bronfenbrenner, 1979; Bronfenbrenner & Morris, 2007). These subsystems, as depicted in Figure 1, can mutually influence a child's behavior across settings, highlighting the interconnectedness of their development (Bronfenbrenner, 1979; Bronfenbrenner & Morris, 2007). Within this framework, each subsystem can impact a child's behavior in other settings, demonstrating the potential for reciprocal influence. Furthermore, these interactions are influenced by various risks and protective factors, which shape behavioral outcomes (Synder & Duchschere, 2022).

The theory emphasizes the reciprocal nature of human development, where children respond to their environment and actively shape it. This reciprocal process creates a cycle where environmental changes subsequently impact the child. Positive interactions within the

environment can foster adaptation, competency, and self-efficacy, while dysfunctional interactions hinder these positive outcomes (Synder & Duchschere, 2022; Rosa & Tudge, 2013). This applies across different domains, such as the school or home setting. Consistent interactions within the environment are expected to bring about positive changes. Human development is embedded within the dynamic interplay between individuals and their environment. Numerous connected factors influence development and behavior throughout the life course. When attempting to bring about behavioral changes, it is essential to consider the environmental processes that can hinder or facilitate these changes (Synder & Duchschere, 2022).

The Subsystems of EST

Every subsystem in the Ecological Systems theory can be examined for its application to the juvenile justice population. While these subsystems can be discussed individually, speaking of one subsystem can easily result in references to another. This highlights the interconnectedness of these systems and the intricate relationship of these in a youth's environment. The microsystem, mesosystem, exosystem, macrosystem, and chronosystem represent the subsystems in this theory.

Microsystem.

The microsystem acts as the most proximal and immediate setting. It is thus highly influential in shaping behavioral and psychological changes (Bronfenbrenner & Evans, 2000). This system includes groups and individuals that have immediate and direct contact with an individual (Bronfenbrenner, 1979). Within this subsystem, several factors have been recognized as influential in the context of the juvenile justice population, including but not limited to

psychological and psychological factors, families, peers, and schools (Hoskin & Ellis, 2015; Lim et al., 2019; Murray & Farrington, 2010; Woodson et al., 2010).

The family structure is a primary context for growth and development within the microsystem. Several familial factors indicate delinquent behavior, including harsh discipline, inconsistent parenting, parental incarceration, family socioeconomic status, and generational mental health problems (Lee, 2016; Moffitt & Caspi, 2001). Involvement from caregivers is vital to progress toward treatment outcomes for long-term change, particularly with individuals who have conduct issues (Fawley-King et al., 2013; Sexton & Turner, 2010). Notably, the way family should be defined from the lens of the youth, as many youth in the juvenile justice system may not have the normative family structure and dynamic (Lee, 2016).

Peers are also crucial to development as youth typically spend more time with friends than family and regularly seek them out for support (Brown & Klute, 2006). As such, the quality of these relationships should be assessed, and youth should be encouraged to seek positive interactions and support. Negative peer influences, particularly with justice-impacted youth, can also normalize antisocial behaviors and attitudes (Shader & Beauchaine, 2020). The contagion effect suggests that the interaction of multiple youth with similar problem behaviors can reinforce, if not amplify, those behaviors (Dishion & Piehler, 2009).

Youth in the juvenile justice system also tend to face difficulties with school attendance and have a higher risk of dropping out (Murray & Farrington, 2010). Using the EST lens, several ecological factors can help explain these behaviors, such as environmental stressors (exposure to trauma at school, transportation issues) or family-related stressors (lack of supervision, housing instability, or insecurity). Additionally, if youth experience out-of-home placements,

their school credits may not transfer, making them fall behind. The buildup of these issues can further contribute to disengagement in school for this population.

Exosystem.

The exosystem contains institutions, settings, and social structures that individuals may not be directly involved or a part of, but they still influence them. Examples include parental occupation and workplace (Synder & Duchschere, 2022). Families that have stable employment tend also to have greater financial resources. However, suppose these families have youth involved in the juvenile justice system. In that case, they may face challenges as they may need to participate in court proceedings and may not have enough time off days to attend. For treatment to be effective and for court goals to be achieved, they must be realistic for the families involved. Another example can include parental trauma. Intergenerational trauma can affect youth when they do not understand the role it plays in how their parents interact with them. Courts must work to understand the complexity of a child's life and how this can compete or cooperate with other developmental systems and influences. Failure to adequately intervene in other systems of care that could have ultimately mitigated exposure to risk factors can lead to involvement in the justice system for youth. While the justice system may not be an ideal provider of trauma treatment, the rehabilitative goals require the court to understand these complexities to reduce the chances of future reoffending (Synder & Duchschere, 2022).

Mesosystem.

The following system, the mesosystem, includes interactions with proximal social environments. It includes interactions primarily between the school and the family, family and court, and child welfare and juvenile justice systems. It highlights the interplay between the

subsystems. As individuals enter new settings, the mesosystem expands. Additionally, as youth become further entrenched in different care systems, their environment increasingly becomes affected by more and more actors and factors. Youth in the juvenile justice system often have to navigate interactions with many systems at once, such as the child welfare system. These interactions can impact risk and protective factors (Synder & Duchschere, 2022). If these systems collaborate effectively, it can drastically change the developmental trajectory of youth.

Macrosystem.

The macrosystem reviews the broad influence of culture and society. This system can shape a family's cultural and social exchanges and beyond. It includes belief systems, values, laws, social norms, and ideology. It can also encompass formal structures such as legislation around juvenile delinquency. It highlights the role of culture in everyday meaning-making and its influence on an individual's cognitive processing. The macrosystem provides the broader context within which other ecological systems operate, significantly impacting experiences and development (Synder & Duchschere, 2022).

Chronosystem.

The final subsystem, the chronosystem, focuses on time and history. Internal and external factors influencing a person's development are considered here. Internal factors can include biological processes such as illness, puberty, and aging. External factors can be significant events, such as the birth of a child. This subsystem also acknowledges the relevance of time across generations. This means events and experiences can have lasting effects on individuals and their future generations. For example, intergenerational trauma exemplifies the critical role of the chronosystem. It recognizes the impact historical events can have on the

long-term consequences for individuals and their families. In juvenile justice, if a youth spends long periods away from home, that can significantly affect their outcomes (Synder & Duchschere, 2022).

The EST provides a useful lens for understanding and working with youth in the juvenile justice and child welfare systems. It recognizes the inherent reciprocal nature of the relationship between individuals and the environment surrounding them. This theory distinguishes itself from other theories of delinquency as others may overlook the ecological context and how factors related to it can inform intervention strategies. For instance, maltreatment experiences can manifest within and across several subsystems and, in turn, influence various aspects of a youth's life, including decisions to engage in delinquency. While maltreatment does not necessarily have to result in criminal activity, as its responses can vary, the symptomatology associated with exposure to maltreatment can contribute to survival coping mechanisms, risk-taking behaviors, and externalizing behaviors for youth (Synder & Duchschere, 2022). The complexity of needs that can arise from maltreatment requires time and an understanding of the diverse ecological influences at hand to support positive change effectively.

EST and the RNR Model

In modern-day risk assessments, the EST is often used to assess the complex and multifaceted nature of risks, including those related to health, safety, and the environment. Risk assessments based on the ecological model consider individual, relational, community, and societal factors that can contribute to risk. The RNR model and EST can be employed foundationally to understand and address the risks and needs of dual-status youth. The RNR

model emphasizes the overall risks and needs factors relevant to offenders. The ecological theory can inform the assessment of individual risks and needs within the broader context of ecological systems.

Furthermore, EST can enhance the responsivity component, one that still needs deeper understanding within the juvenile justice context, as highlighted above, by considering the environmental factors that can influence the utility and effectiveness of an intervention for youth. Integrating these two models is crucial to having a holistic understanding of a youth's life and designing effective interventions, particularly for dual-status youth. The tool used in corrections that best incorporates the foundations of RNR and EST is risk assessment instruments.

Development of Risk Assessments

The structure of the juvenile justice system relies on several discretionary practices made on youth that have entered into the system for ranging delinquent behaviors. Over the last several decades, juvenile courts have moved away from relying on unstructured professional judgment that yields inconsistent outcomes. Instead, the court has turned to more structured assessment processes to make decisions about outcomes for youth. Advocates of the Risk, Needs, and Responsivity model suggest systematic evaluations are the first step to effective treatment (Bonta 2002). Such practices are essential to the range of decisions made by the court and correctional actors that ultimately significantly impact youth. While several other dimensions related to policies and procedures are imperative to ensure effective and fair practices in the court, juvenile risk and needs assessments provide a promising avenue for more systematic decision-making.

The juvenile justice system has predominantly employed three methods to determine risk: clinical judgment, actuarial assessment, and structured professional judgment (Sullivan & Childs, 2022). Clinical judgment has involved pulling information from relevant sources such as parents, social workers, and history, then relying on a judge's experience and knowledge to make decisions about a youth's risks and needs. Actuarial assessments aggregate and synthesize several attitudes, behaviors, and circumstances indicators from prepopulated questions to understand risk. A formula is then used to calculate a score that places youth in a category that generates the probability of reoffending. This method allows for professional overrides should the court determine that the risk level disagrees with the courts' standards; however, this use varies heavily across states and agencies (Sullivan et al., 2019). The final and most recently updated method, structured professional judgment, blends clinical and actuarial approaches. This practice uses predetermined questions to identify risk factors, and risk level is computed using appropriately defined guidelines that assist the user in their assessment. This approach allows stakeholders to systematically assess the risk factors relevant to each case (Sullivan & Childs, 2022).

Generations of Risk and Needs Instruments

Over time, four generations of risk assessment instruments have used varying assessment methods.

The first generation of assessments relied heavily on professional, unstructured judgments. Determinations about a youth's risks and needs were generally based on a professional's experience and opinions that they generated from standardized questions. However, gathering the answers to these questions was not wholly objective or systematic

(Sullivan & Childs, 2022). These assessments are rarely utilized in the juvenile court today (Wachter, 2015).

Second-generation risk and needs assessments rely on static factors, particularly items related to criminal history, to determine risk. Thus, these instruments are actuarial. Prediction and classification are at the root of these assessments (Schwalbe, 2008). They are limited in their focus on static factors as these cannot change with treatments or interventions (Andrews et al., 2006).

Third-generation instruments are generally considered more empirically and theoretically informed (Howell et al., 2014; Andrews et al., 2006). Static and dynamic risk factors are used to predict risk in these assessments. These factors are also used to guide and inform case management and planning. Third-generation instruments consider the overall results of the assessment and the specific risk factors identified, how they relate to recidivism, and the degree to which they can change with appropriate intervention (Sullivan & Childs, 2022). They serve the function of both predicting risk and identifying treatment needs. The Youth Level of Service/Case Management (YSL/CMI, Hoge & Andrews, 2002) is an example of this type of instrument. It is also a standard tool used by juvenile justice agencies. This tool measures the following: prior offending history, family situations and circumstances, employment and education, peer relationships, substance use, leisure and recreation, attitudes, behaviors, and personality. Each domain is measured based on a series of yes-no check marks to determine a point value for each criminogenic risk assessment item, with each point suggesting a greater risk for recidivism. Risk assessment points are summed to produce an overall risk level.

Fourth-generation assessments assess protective factors and static and dynamic risk factors. The strength of these instruments is that they enhance a practitioner's ability to match needs to intervention plans while considering the youth's resiliency or desire to change. Another strength of fourth-generation instruments is the need to reassess youth to inform services better regularly (Andrews et al., 2006). The Structured Assessment of Violence Risk in Youth (SAVRY, Borum et al.) is an example of this type of instrument. The SAVRY uses structured professional judgment and measures static, dynamic, and protective factors, allowing administrators to consider various information when making structured decisions about risks and needs.

Assessing the Performance of Risk Assessments Across Populations

A large body of research is dedicated to examining the utility and performance of assessment tools and methods for assessing the risk of reoffending. There is overwhelming evidence that actuarial methods produce more accurate risk determinations than unstructured judgments (Shlonsky & Wagner, 2005). This is a consistent finding across all assessment instruments and all system-involved populations, adults and youth (Sullivan & Childs, 2022). Existing research shows that actuarial assessments and structured professional judgment methods are similarly accurate in predicting future offending behaviors (Yang et al., 2010).

Age and Juvenile Risk and Needs Assessments

Understanding how age affects risk and needs instruments is crucial and has important implications. A number of factors determine why one may choose to engage in offending behaviors. Adolescent development is a critical reason. Key risk factors also vary and differ at this time, which could impact assessments and their ability to predict youth outcomes (Childs et

al., 2010). Adolescent development plays a critical role in one's decision to engage in behavior, and it can shed light on how individual and contextual risk factors impact behavior over time. Thus, it is imperative to understand how age differences affect juvenile risk and needs tools. Few scholars have explored this, and those that have reported mixed results. For example, Viljoen et al. (2009) found that risk level only predicted reoffending for older youths (16 and older). These results were consistent across three tools: YLS/CMI, Psychopathy Checklist-Youth Version (PCL-YV), and The Estimate of Risk of Adolescent Sexual Recidivism (ERASOR). Another article by Childs and Frick (2016) found that the SAVRY predicted both violent and general recidivism for the 13-15 age category but not for the 16-18 age category. The results of these two studies highlight the need to examine the role of age in the predictive validity of juvenile risk assessment tools.

Gender and Juvenile Risk and Needs Assessments

Researchers have also considered the role gender plays in the predictive validity of assessment tools. This makes sense as most analyses of justice-involved youth sample boys. Thus, any predictive differences between girls can get lost (Sullivan & Childs, 2022). Scholars have also noted several differences across delinquent boys and girls that may influence measurements of risks and needs, including lower rates of violent and nonviolent behaviors among girls and variation in development trajectories (Odgers et al., 2005). Much attention has also been allocated to highlighting the need for gender-responsive services and practices in the juvenile court. These highlight “gendered” pathways to delinquency and differential exposures to risk factors across girls and boys (Belknap & Holsinger, 2006; Holsinger, 2000). For example, victimization and maltreatment are risk factors numerous scholars have identified as critical to

girls' delinquency pathways, which also have varying prevalence and impact across the two groups (Sullivan & Childs, 2022; Vitopoulos et al., 2019; Truanvoic et al., 2015; DeHart & Moran, 2015). Most relevant to the current study, prior research that investigated experiences of abuse suggested a "gender paradox" where internalized responses to abuse by the youth, such as mental health related risks and diagnoses, were found to be greater in girls than boys (Campbell, 2023).

In contrast, boys' externalized responses were more likely to include participation in delinquency. Additionally, research has demonstrated that the pathways to delinquency can vary across genders for youth with maltreatment history. For example, girls are significantly more likely to self-report victimization as an essential factor that contributed to their criminal behavior than boys. Among the dual-status population, girls also have a later onset of delinquency than boys. Nonetheless, many researchers have found overall predictive accuracy for risk tools across both gender groups (Barnes et al., 2016; Van der Knaap et al., 2012; Smith et al., 2009). This is true for both general and violent recidivism (Holtfreter, 2018; Olver et al., 2009; Schwalbe, 2008).

Race/Ethnicity and Juvenile Risk and Needs Assessments

There are several reasons to examine the accuracy of risk assessment tools across racial and ethnic categories. For example, marginalized groups are more likely to score higher on risk assessments than their counterparts due to increased exposure to social inequality and risk (Sullivan & Childs, 2022). As such, risk tools could overestimate their risk of reoffending by conflating the exposure to risk and actual propensity for delinquency. Assessment methods that relied on static factors thus placed these groups at a significant disadvantage due to biases in

arrests and subsequent court decisions (Leiber et al., 2016; Peck & Jennings, 2016). Existing studies report risk levels are higher for minority groups (Vincent & Viljoen, 2020; Perrault et al., 2017); however, it appears predictive validity is similar across racial groups (McCafferty et al., 2017; Baglivio & Jackowski, 2013; McGrath & Thompson, 2012; Olver et al., 2009; Chapman et al., 2006; Schwalbe et al., 2006).

Validity of Risk Instruments for Dual-status Youth

Despite the various studies that demonstrate that maltreated youth are at a higher risk for delinquency, a report by the Child Welfare League of America (2002) found that less than ten percent of juvenile justice systems use valid assessments of maltreatment when processing youth (Bender, 2010; Mersky et al., 2012). As a result, if this subgroup of maltreated youth is assessed using a general risk assessment tool, stakeholders may underestimate or overestimate the relationship between risk and recidivism for this population (Onifade et al., 2014). The existing research suggests that dual-status youth represent a distinct subgroup within the young offender population. However, limited attention has been given to evaluating this subgroup's accuracy of risk assessment measures (Onifade et al., 2014). Even less is known about the ecological factors that influence their offending trajectories. As reviewed earlier, dual-status youth are at higher risk for engaging in maladaptive behaviors than other delinquent youth (Cuevas et al., 2007; Ryan et al., 2013). Youth involved in the child welfare and juvenile justice system present a challenge to justice systems that depend on uninformed risk assessments to inform case management and decision-making processes.

More research is needed to determine whether risk and needs assessments that are used in the juvenile setting are valid predictors of future delinquency as well as managing cases

for dual-status youth. Research has identified several subgroups, such as young sex offenders and girls, where these instruments perform differently (Onifade et al., 2014; Onifade et al., 2009; Onifade, Petersen, Bynum, & Davidson, 2011; Onifade, Wilkins, Davidson, Campbell, & Petersen, 2011). One study that examined the validity of the YLS/CMI tool to predict recidivism for dual-status and juvenile justice-only youth found that the dual-status population was more likely to have higher risk scores across family, peers, leisure, personality, and attitudes domains. Given the groups' higher scores on most risk factors, it was expected that this group would also have higher recidivism rates at each level (low, medium, high). However, chi-square analyses showed that reoffense was evenly distributed across the three risk levels. These results showed that the YLS/CMI was not a good predictor of reoffending by risk level (Onifade et al., 2014). Using ROCs, the authors also explored the validity of risk scores in predicting recidivism and found that risk scores did not predict reoffense for the dual-status population. This suggests that while these risk assessments generally consider several risk factors, the extent to which these factors adequately predict outcomes for all youth varies. Another study by Campbell and colleagues (2023) examined the validity of the Ohio Youth Assessment System-Disposition Tool for dual-status youth. The authors first reported the demographic differences between the two groups. Compared to youth only involved in the juvenile justice system, dual-status youth were more likely to be younger and have higher risk scores across the juvenile justice, family, education, lack of prosocial skills, values, beliefs, and attitudes domains.

Additionally, while both populations were predominantly male, dual-status youth had more females. Specifically as it relates to future delinquency, the results revealed that dual-status youth were more likely to receive a new petition and new adjudication within two

years. The authors also shared that the OYAS-DIS total score significantly predicted recidivism for dual-status youth and juvenile justice system-only youth. However, the tool predicted recidivism relatively better for the latter.

Arguments Against the Use of Risk Assessments

As described above, several scholars have evaluated the predictive validity of juvenile risk assessments generally and across various subgroups. However, this is a somewhat limited and still incomplete examination of the utility of these tools in practice. For instance, researchers recommend a reassessment process to track change (e.g., Douglas & Skeem, 2005). However, the regularity of this in practice is understudied. Without these reassessments, initial conclusions about a youth persist throughout their time in court in a fixed manner that could negatively affect subsequent decisions (Sullivan & Childs, 2022). There are also concerns about the impact of assessment and scoring on youth. Even current estimates of the predictive validity of risk tools tend to yield modest values, with AUC values hovering at or below .75 (Sullivan & Childs, 2022). These results are used to conclude that the tools predict future delinquency; however, the same results can be used to suggest that the tools generate false predictions in an arguably large number of cases (Sullivan & Childs, 2022). In conclusion, existing research on juvenile risk and needs assessments, while extensive, is by no means exhaustive in providing a holistic understanding of assessment functioning and processes.

Benefits of Risk Assessments

Previously, we reviewed the primary goals of the juvenile court. One of the primary goals of the court is to rehabilitate youth. To do this, it is necessary to understand a youth's risks and needs and then provide appropriate treatment. The arguments for using risk

assessment instruments for the juvenile justice population are vast. Structured juvenile risk assessment tools have significantly changed the landscape of corrections and policy (Solomon et al., 2016). These tools have been used as a guide for stakeholders to make better decisions about appropriate supervision, programming, treatment, and overall case management (Andrews et al., 2006; Bonta, 1996; Taxman et al., 2004). They have allowed for more consistency and have presented predictive advantages compared to unstructured professional decision-making across various subgroups. Finally, they have provided an evidence-based approach to rehabilitation efforts (e.g., Baglivio et al., 2015). Over the past two decades, significant efforts have been made to evaluate and improve the effectiveness of risk assessment measures in predicting future criminal behavior (Catchpole & Gretton, 2003; Onifade et al., 2008; Schmidt et al., 2011; Vieira et al., 2009). Various systematic reviews examining the validity of these measures suggest that they accurately categorize youth in terms of their likelihood of re-offending (Olver et al., 2009; Schwalbe, 2007, 2008; Shepherd, Luebbers, & Dolan, 2013). The use of these measures, which categorize delinquent youth as having a low, moderate, or high risk for recidivism, has been shown to reveal significant and meaningful differences in delinquency outcomes (Onifade, Petersen, et al., 2011; Onifade, Wilkins, et al., 2011; Onifade et al., 2009). These tools have provided much-needed strides toward understanding and addressing delinquent behavior.

Ohio Youth Assessment System

In efforts to address gaps in the effective delivery of juvenile justice programming, Ohio recognized a need for a risk assessment system that could be used statewide (Lovins & Latessa, 2013). The Department of Youth Services (DYS), in partnership with the University of Cincinnati

Center for Criminal Justice Research (CCJR), worked collaboratively to develop an assessment that could address the needs of youth at various stages of the juvenile justice system (Lovins & Latessa, 2013). Using the foundations of the RNR model, the result was the Ohio Youth Assessment System (OYAS). Before the creation of this assessment, 77 different tools were utilized across the state compared to now, where 39 counties have adopted the OYAS (Campbell et al., 2020). The assessment is intended to be used at various stages of the juvenile justice process. It contains five tools: diversion, detention, disposition, residential, and reentry. In alignment with recommendations for the development and use of risk assessment, each tool is meant to be completed at the appropriate stages to determine a youth's criminogenic needs and aid in guiding decisions regarding interventions. For this dissertation, the focus will be on Ohio's disposition tool - OYAS-DIS.

Validation Studies for the Use of the OYAS on Varying Populations

While a relatively understudied assessment compared to other juvenile risk and needs instruments, such as the YLS/CMI and the Structured Assessment of Violence Risk, available research does show promising results for the utility of the OYAS-DIS tool. Scholars have found this valid tool for predicting general recidivism (Lovins & Latessa, 2013; McCafferty, 2013; Latessa, Lovins, & Lux, 2014; Latessa et al., 2009). The tool has also benefited specialized offender populations such as sex offenders (Papp et al., 2020). On the other hand, evidence suggests the tool may predict better for specific groups. For example, Campbell and colleagues (2019) examined the utility of the OYAS-DIS tool for different racial and gender subgroups. The authors found that the tool significantly predicted recidivism for all subgroups; however, the tool also did significantly better at predicting recidivism for White boys compared to Black boys.

As mentioned before, Campbell and colleagues (2023) also found that the OYAS-DIS tool did well in predicting the risk for recidivism for dual-status youth.

Current Study

Given the literature that has been reviewed, several gaps still exist regarding evaluating dual-status youth. First, more research is needed to examine the demographic distinctions between dual-status and juvenile justice-only youth. Further insight is needed into whether treatment outcomes differ between youth with and without a history of child welfare involvement. The influence of factors such as gender on the relationship between child welfare status and treatment outcomes is also understudied. Next, It is unclear whether the impact of treatment on recidivism varies depending on child welfare history. Finally, more investigation is required to understand if youth with child welfare history come back faster than youth only involved in the juvenile justice system.

Examining the unique role of maltreatment for delinquent youth is detrimental not just to the systems that interact with them but also to the youth themselves. These vulnerable youth present unique needs and thus should not receive blanket assessments and treatments. Research tailored towards this distinct population can also highlight the systemic inefficiencies of the child welfare and juvenile justice system. Understanding how these two systems interact can offer better coordination and support for dual-status youth. The present study will build on the work of Campbell and colleagues (2023) on outcomes of dual-status youth once they enter the system and highlight how incomplete assessment can lead to cycles of delinquency for these youth. The specific research questions this study will answer include the following:

Part 1: Treatment Outcomes

1. What are the demographic differences between dual-status youth and juvenile justice system-only youth?
    a. Hypothesis: Dual-status youths will be demographically different from youth only involved in the juvenile justice system.
2. How well does the OYAS-DIS total score and domains predict recidivism for dual status and juvenile justice only youth?
    a. Hypothesis: The tool will better predict recidivism for juvenile justice youth.
3. How well does the OYAS-DIS total score and domains predict recidivism for dual status and juvenile justice only boys and girls?
    a. Hypothesis: The tool will predict recidivism best for boys with no maltreatment history.
4. What is the main effect of child welfare status on treatment outcomes?
    a. Hypothesis: Dual-status youth are more likely to receive treatment and services compared to youth only involved in the juvenile justice system.

Part 2: Recidivism Outcomes

5. What is the moderating effect of treatment outcomes on child welfare status and recidivism?
    a. Hypothesis: The moderating effect of treatment outcomes on the relationship between child welfare status and recidivism will be observed for both groups. The relationship will be stronger for the juvenile justice-only population.
6. What are the differences in time at risk for dual status and juvenile justice system-only youth?

   a. Hypothesis: Dual-status youth will recidivate faster than juvenile justice-only youth.

7. What are the differences in recidivism rates between dual status and juvenile justice system only youth after matching on key demographic characteristics and general risk factors?

   a. Hypothesis: After matching on key demographic characteristics, neglect status will still have a significant effect on recidivism outcomes.

METHOD

This study examines the role of maltreatment history in youth risks, needs, and responsivity to treatment. Dual-status youth and youth involved in the juvenile justice system alone will be compared to understand the similarities and differences between the two groups. This study will unpack how child welfare status informs treatment outcomes and how factors such as maltreatment and gender affect program disposition and recidivism. Ultimately, the relationship between maltreatment, disposition received, and delinquency outcomes will be reviewed. Seven research questions will guide the current quantitative research study.

Data Collection

The OYAS has five tools that are appropriate to use for different stages of the juvenile justice system: 1) diversion, 2) detention, 3) disposition, 4) residential intake, and 5) residential reentry (Lovins & Latessa, 2013). The researchers employed a nonprobability sampling technique to collect the data. All youth involved with the single, large, Midwestern court between January 2010 and December 2016 were assessed using the OYAS. Those who required intervention also completed an interview for the OYAS-DIS tool. This tool determines risk during the disposition stage and helps guide intervention decisions (Latessa et al., 2009). The results of this tool aided judges in determining the best treatments for adolescents. Risk assessment data was paired with other information about the youth, such as census, initial charge and recidivism, and probation data. This information augmented the value of the risk assessment as it added to the information the judge could use to make decisions.

Sample

The data for this study was collected utilizing a nonprobability sampling technique known as purposive sampling. In purposive sampling, researchers use their expert judgment to create a sample that is assumed to be representative of the population of interest (Singleton & Straits, 2012). This technique is accomplished by using knowledge about the population to create a sample in a non-random fashion that is used to represent the population. Purposive sampling offers the ability to create a sample relatively quickly. With this method, the more researchers know about their population, the better and more generalizable the sample will be.

Court records were included in the sample based on several inclusion criteria for the present study. First, youth are to have received the OYAS-DIS assessment between January 1, 2010, and November 1, 2016. The start date is most appropriate as the OYAS-DIS tool was fully integrated and implemented in the court at this time. The end date was chosen as it closely coincides with when records were pulled from the court's databases. Next, only initial OYAS-DIS assessment screenings were included; any additional assessments following were not included. Finally, youth were to have been involved with the court for at least one year for some research questions to collect recidivism data. The study was completed on November 1, 2017. Thus, the cut-off point for being involved with the court and assessed is November 1, 2016. For other questions, follow-up periods could vary to optimize the sample. Youth were also excluded from the sample if they were not coded for maltreatment history. The final analytic sample was reduced from 4,383 to 3,133 adjudicated youth. The variables in the analyses capture maltreatment, demographics, risk assessment, and recidivism data. The reduction in the sample is attributed to creating the most appropriate data set for the current research questions.

Measures

The following measures were used in this analysis using the OYAS-DIS tool. Each measure is described below, along with measures of central tendency to describe the sample. Descriptive data for the sample is provided in Tables 2, 3, and 4.

Dependent Variables

Recidivism.

Generally, recidivism is defined as rearrest or reoffending behavior by offenders. For the present study, recidivism will be operationalized as new petitions to the court. A petition is a formal document filed to the juvenile court to initiate a case. It states allegations against a minor for actions related to delinquency, dependency, and status offenses. The petition requests that the court take action. In the current study, for questions that required the same one year follow-up time, youth were tagged for whether or not they received a new court petition within one year of their initial petition. Youth who did not receive a new petition were coded as "0," and those who did receive a new one were coded as "1." In the final analytical sample, 1,192 (38.05%) of youth received a new petition, while 1,941 (61.95%) did not receive a new petition. The same coding scheme was used when recidivism was defined as a new petition at any time. This is defined as whether or not a youth received a new court petition after their initial petition at any point during the study period. In this scenario, 1,598 (51.01%) of youth received a new petition, and 1,535 (48.99%) did not receive a new petition.

Disposition.

Post-adjudication, youth could be sentenced to several dispositions. These dispositions include probation and programs. The probation variable in the dataset is a binary indicator of whether or not a youth received probation, regardless of length. The programs variable

includes all options for programming including community and residential programs, more specifically, vocational training, cognitive behavioral therapy, faith-based treatment, family-focused treatment, mindfulness training, programs designed for sex offenders, substance abuse treatment, mental health services, educational training, advocacy or mentoring, and programs focused on reentry. For this study, youth were coded as "1" for receiving "neither programs nor probation," "2" for "programs only," "3" for "probation only," and "4" for "both programs and probation." In the total sample, 1,010 (32.34%) youth received neither programs nor probation, 953 (30.42%) received programs only, 482 (15.38%) received probation only, and 688 (21.96%) received both programs and probation.

Independent Variables

Age.

Age refers to the recorded age of the respondent during the initial risk assessment. The sample ranged from 11-18 years old. The average was 15.54 years old, with a standard deviation of 1.48 years.

Race.

Youths were asked to self-identify their race. Youths' race was coded as: "0=Black, "1 = White," "2 = American Indian or Alaskan Native," "3 = Asian," "4 = Native Hawaiian or Other Pacific Islander," and "5 = Unknown." For this study, the American Indian or Alaskan Native, Asian, Native Hawaiian or Other Pacific Islander, and Black categories were collapsed into one category for "Nonwhite." The final coding scheme was: "0 = Nonwhite," "1 = White." In the sample, 2,114 (67.48%) youth were nonwhite, and 1,019 (32.52%) were white.

Sex.

Youth's sex was also reported during the risk assessment interviews. Sex was coded as "0 = Male" and "1 = Female." The sample included 2,516 (80.31%) male youth and 617 (19.69%) female youth.

Crime type.

Crime type was a dichotomous coding of the most serious charge on the initial petition. These were coded as either violent or non-violent. Violent offenses include violent personal offenses and sex offenses that involve rape and imposition. Nonviolent charges include property, drug, and public order petitions that do not include the threat of harm or actual attack on a victim. In the total sample, 1,753 (55.95%) engaged in a nonviolent act, and 1,380 (44.05%) engaged in violent acts.

Maltreatment History.

Youths' maltreatment history was considered in this analysis. Youths' case history was examined to determine whether they had a substantiated case of maltreatment within the child welfare system. Those with at least one substantiated case were considered "dual-status youth" for this study. Youths' maltreatment history was coded as "0" for those who did not have a maltreatment history and "1" for those with a maltreatment history. There were 3,000 (95.75%) juvenile justice-only youth in the sample and 133 (4.25%) dual-status youth.

Risk Level.

Risk level in this study refers to the sum of all individual scores in each item in the OYAS-DIS tool categorized into three groups. These levels of risk correlate with cut-off risk scores. Youths within a specific range will be categorized as low, moderate, or high risk for recidivism. Across seven domains, 32 items are measured in the OYAS tool as significant predictors of new

arrest. These domains include the following: (1) juvenile justice history, (2) family and living arrangements, (3) peers and social support networks, (4) education and employment, (5) pro-social skills, (6) substance abuse, mental health, and personality, (7) values, beliefs, and attitudes (Latessa, E. et al., 2009). Court staff then used the tool and the scoring guide to interview youth. Scores can range from 0-30. Based on cutoff scores, females between 0-12 are considered low risk, 13-18 are moderate, and 19-33 are high-risk offenders. As for males, scores between 0 and 11 are classified as low risk, 12 to 18 are moderate, and 19 to 33 are high risk (Latessa et al., 2009). In the sample, scores ranged from 0-30, with the average score being 12.25 points with a standard deviation of 5.68 points. The full analytical sample consisted of 1,396 (46.53%) low-risk youth, 1,169 (38.97%) moderate-risk youth, and 435 (14.50%) high-risk youth.

Statistical Analyses

The research questions for the current study are broken up into two parts. Part one will examine treatment outcomes for the two groups of interest. The second part reviews recidivism outcomes.

Part 1

What are the demographic differences between dual-status youth and juvenile justice system-only youth?

Chi-square tests were employed to test this. The chi-square is a statistic used to test for differences within and between data. Essentially, it tests for the difference in what is observed versus what is expected. This type of test is particularly appropriate for assessing differences in distribution of categorical variables for groups.

Several assumptions must be met for chi-square analyses. First, the sample must be randomly drawn. This assumption is violated as this data was collected using purposive sampling. Second, independent random sampling must be utilized. A "test of independence" is used in a two-sample chi-square analysis, meaning that choosing a case from one sample does not affect choosing a case from the second sample. Data was collected on all youth who entered the court during the study period. Thus, this assumption is not violated. Including a youth did not affect the chances of another youth being included in the sample. The third chi-square assumption is that nominal or categorical data must be used. While other levels of data may be used, they will be treated as categorical. This assumption is satisfied. The final assumption requires a large enough sample to represent each cell. Specifically, no cell can have zero cases, or the chi-square will become unstable and biased. A general rule of thumb is not to use a chi-square test when 20% of the cells have a frequency of 5 or less. This assumption has also been met.

Degrees of freedom in the chi-square test refer to the number of categories that are free to vary after constraints. Each degree of freedom produces a different chi-square distribution. As the degrees of freedom increase in the chi-square test, the distribution becomes less skewed to the right and appears more normal. In a two-sample chi-square test, df=(r-1)*(c-1); r refers to the number of rows, and c refers to the number of categories in a contingency table.

T-tests will also be used to answer the first research question, specifically for examining the differences in the age and total score for dual-status and juvenile justice-only youth. An independent samples t-test compares the averages or means of continuous variables between

two independent groups. It is a more appropriate test than chi-square for variables like age and total score which are continuous.

There are several assumptions for *t*-tests as well. First, the dependent variable should be interval or ratio level. This assumption is violated, given that the dependent variable, neglect status, is categorical. Second, the sample size must be greater than 30 because when the sample size is greater than 30, the *t*-distribution mimics the normal distribution and matches the normal distribution identically when the sample size is 500. This assumption is met. Randomization is necessary for an independent samples t-test to reduce bias or the likelihood that no characteristic is over- or under-represented in either group. This assumption is not met. There is also an assumption of shared variance or homoskedasticity. This assumption explains that the populations from which the samples are drawn have the same variance or standard deviations. Homoskedasticity is assessed using an *F*-test for equality of variance. In the independent samples *t*-test, degrees of freedom refer to pooled variance and consider both sample sizes.

How well does the OYAS-DIS total score and domains predict recidivism for dual-status and juvenile justice-only youth?

To test this, Area Under the Curve (AUC) analysis was employed. AUC analysis is a common method used in statistics to evaluate the performance of binary classification models. The AUC value represents a model's ability to accurately distinguish between negative and positive cases across various thresholds. The AUC calculates the area under the Receiver Operating Characteristic (ROC) curve, which describes the ratio of true positive identifications against false positive identifications. AUC values can range from 0 to 1, a higher value indicates better

performance. In other words, the higher the AUC, the better the model is at correctly identifying true positive cases. An AUC of .5 means the model does not predict better than chance, while an AUC of 1 indicates perfect classification. Practically, this analysis helps compare various models or finetuning model parameters in order to optimize performance. It also benefits from interpretability, representing the probability that the model ranks a randomly selected positive case higher than a randomly selected negative case.

How well does the OYAS-DIS total score and domains predict recidivism for dual-status and juvenile justice-only boys and girls?

AUC tests were used to test this as well. As noted above, this test evaluates the ability of the OYAS-DIS tool to discriminate between those that receive a new petition and those that do not. It is also particularly useful for assessing the predictive validity of the tool across different subgroups like dual-status and juvenile justice-only youths. AUC offers a robust indicator of predictive performance and ensures the effectiveness of a model is not dependent on a specific cutoff.

What is the main effect of child welfare status on treatment outcomes?

Logistic regression was used to test this. Logistic regression is commonly used when researchers seek to estimate relationships in which the dependent variable is binary, as in this case (i.e., recidivism; Fox, 2015). This method is appropriate for explaining the relationship between a dichotomous dependent variable and one or more variables, which can be nominal, ordinal, interval, or ratio levels of measurement. In a regression analysis, logistic regression estimates the parameters of a model. It uses a probabilistic framework called the maximum likelihood estimation (MLE). This process includes an assumed probability distribution for the

model. A set of parameters is then created for the logistic model using MLE. A likelihood function then estimates the chances of observing an outcome based on the model and the data. The likelihood function can be maximized to identify the parameters that lead to the largest sum likelihood in the observed data (Brownlee, 2019).

In logistic regression, several assumptions are made. The assumptions of logistic regression must be satisfied for the results of our analyses and statistical inferences to be valid. If these assumptions are unmet, issues such as biased estimates or significant standard errors could arise. The first is that the outcome is binary. Second, there should be a linear relationship between the logit of the dependent variable and any predictors. Third, multicollinearity should not be high among the predictors. These assumptions are met. Next, the model must be a good fit for the data. In logistic regression, outcomes are predicted based on identified independent variables. However, these models are susceptible to overconfidence. This means that due to sampling bias, the models can overestimate predictive power (Brownlee, J., 2019). Thus, before we use a model to predict future outcomes, we must ensure the model is correctly specified. Finally, the sample size should be more significant than 10. The data being utilized should not interfere with the assumptions being made by the present model.

Part 2

What is the moderating effect of treatment outcomes on child welfare status and recidivism?

Logistic regression with moderation was used to answer the question. By including the interaction term, we were able to appropriately assess whether the relationship between child welfare status and recidivism differs depending on whether a youth received treatment. The

interaction terms allow for a more nuanced understanding of the combined influence of child welfare status and disposition type on recidivism.

What are the differences in time at risk for dual-status and juvenile justice system-only youth?

Survival analysis was used to test this. Survival analysis is particularly well-suited for time-to-event data and analyzing the time until a specific event occurs. "Events" can encompass anything, from the time to the occurrence of disease to the completion of tasks. Generally, the analysis focuses on the time it takes for a unit of analysis to experience the event, hence the "time to event" phrasing. In this context, the event of interest is time for a new petition following an initial one. This method is also helpful and accommodates a common occurrence in longitudinal studies where not all units of analysis experience the event of interest during the study period. In this case, individuals are considered censored. This analysis involves the survival function estimation, which is the probability that the event has not occurred at a specific time. Survival probabilities can be visualized over time using a Kaplan-Meier curve. For the current study, youth were followed for varying follow-up times, with some only being followed for one year and others for as long as six years. A youth's probability of failure will be drastically different if they were followed for one year versus six years, which makes considering these follow-up times particularly important. The Kaplan-Maier curve allows for these differences to be managed, while still providing a picture of recidivism patterns for dual-status and juvenile justice-only youth.

To further analyze the time to event, Cox Proportional Hazard Model was also employed. The analysis models event rates for events where censoring may occur or cases where the outcome of interest is not observed by the end of the study window (Connell

2012; Allison, 2010). The Cox regression model was used to determine the extent to which the covariates in the model influence survival time. This model follows a regression framework by employing a log-linear function. Youth who did not receive a new petition were censored after the study period.

What are the differences in recidivism rates between dual-status and juvenile justice system-only youth after matching on key demographic characteristics and general risk factors?

Propensity score matching (PSM) was used to test this. PSM is a useful application for estimating the effect of a treatment by controlling for variables that could predict receiving the treatment being observed. The assignment of treatments is not always random for studies such as observational studies. This can lead to selection bias where the control and treated groups differ in ways that could affect the outcome of interest. PSM is used to create a comparison group that is similar to the treatment group in regards to observed covariates. This technique mimics randomization. Once the groups are matched, checks are made to ensure the covariates are balanced, meaning the distributions of the covariates are similar in both groups. With balanced groups, treatment effects can then be estimated.

To evaluate the effect of neglect status on recidivism, this test was employed. Given that research has previously demonstrated that youth with maltreatment history differ on key demographics and risk, this study sought to make comparisons beyond this. This procedure combines control variables to develop scores that reflect similarity across cases. Then, to approximate the treatment effect, the analysis groups those with similar propensity scores, but with varying treatment levels (e.g., dual-status versus juvenile justice-only) are compared on the dependent variable. In the current study, propensity score was created using the domains

of the OYAS-DIS tool as well as age, race, sex, and crime type. PSM can select youth that received a maltreatment petition and those that did not who are statistically similar based on these covariates (Apel & Sweeten, 2010). Once they were matched, the differences between the two groups are independent of the covariate (Apel & Sweeten, 2010; Rubin, 2005). In essence, this statistical analysis attempts to examine what the chances of recidivism would have been if a youth did receive a maltreatment petition. In other words, it observed the true difference in likelihood of receiving a new petition between dual-status and juvenile justice-only youth.

RESULTS

Part 1: Treatment Outcomes

What are the demographic differences between dual-status youth and juvenile justice system-only youth?

Most of the assumptions for chi-square tests have been met for this analysis. First, the independence assumption suggests that the selection of one case should not affect the selection of another case. Data was collected on all youth that entered the court during the study period, thus this assumption is not violated. Additionally, samples should be large enough in each cell. As a general rule, groups should not have zero cases, and expected frequencies should not be less than 5. Given the relatively large sample in both groups, this assumption is also met. The final assumption is that the sample is randomly drawn. As this data was collected using a purposive sampling technique, this assumption is violated.

Youth in the current study were compared across several demographic characteristics including age, race, sex, total score, crime type, risk level, disposition received, and recidivism. The chi-square results are depicted in Table 5, and the t-test results are in Table 6. While race, crime type, and risk level were not significantly different, results of t-tests and chi-square analyses determined significant differences between the groups across other variables. Specifically, in terms of sex, there were 2,420 male juvenile justice system-only youth and 96 male dual-status youth observed. The expected values were 2,409.2 and 37, respectively. There were also 580 female juvenile justice-only youth and 37 female dual-status youth. The expected values were 590.8 juvenile justice girls and 26.2 dual-status girls. The chi-square test ($\chi^2 =$

5.80, *p* = 0.02, df = 1) indicate that there is a statistically significant difference in sex between juvenile justice system-only youth and dual-status youth.

In terms of dispositions received, 956 juvenile justice-only youth received no programs or probation, 911 received programs only, 455 received probation only, and 678 received both. The expected values for juvenile justice youth were 967.1 to have received no programs or probation, 912.5 to have received programs only, 461.5 to have received probation only, and 658.8 to have received both. For dual-status youth, 54 received no programs or probation, 42 received programs only, 27 received probation only, and 10 received both. The expected values for dual-status youth were 42.9 to have received no programs or probation, 40.5 to have received programs only, 20.5 to have received probation only, and 29.2 to have received both. The chi-square test ($\chi^2 = 18.45$, *p* = 0.00, df = 3) indicate that there is a statistically significant difference in disposition received between dual-status youth and juvenile justice system-only youth.

In terms of recidivism, 1,872 juvenile justice youth did not recidivate, and 69 dual-status youth did not recidivate. The expected values were 1,858.6 and 82.4, respectively. On the other hand, 1,128 juvenile justice youth did recidivate, and 64 dual-status youth also recidivated. The expected values were 1,141.4 and 50.6, respectively. The chi-square test ($\chi^2 = 5.98$, *p* = 0.01, df = 1) suggest a statistically significant difference in recidivism between dual-status youth and juvenile justice system-only youth.

There are also assumptions for the use of the t-test. The first assumption of independence is still met. The assumption of normality, which states the dependent variable is normally distributed within each group is violated. The Shapiro-Wilk test for normality was

conducted to assess this assumption. The test statistic was significant for juvenile justice-only youth (W = .98, $p < .05$) and nonsignificant for dual-status youth (W = 1.12, $p > .05$). In other words, age is normally distributed for dual-status youth, but not juvenile justice-only youth. Similar findings were reported for total score. For juvenile justice-only youth, total score was not normally distributed (W = .99, $p < .05$), but was normally distributed for dual-status youth (W = .98, $p > .05$). Finally, equal variance of age and total score across the two groups was also tested. Levene's test reported insignificant p-values, meaning there was no evidence of differences in variances of age or total score between the two groups.

On average, dual-status youth were younger than juvenile justice-only youth. The average age of youth without child welfare history is 15.56 years old with a standard deviation of 1.47 years. The average age of youth with child welfare history is 15.08 years old with a standard deviation of 1.59 years. The results of the t-test show that the difference in age between youth without child welfare history and youth with child welfare history is statistically significant ($t = 3.71$, $p < .05$).

Total score was higher for youth with neglect history compared to youth without. The average total score for youth without child welfare history is 12.21 points with a standard deviation of 5.69 points. The average total score for youth with child welfare history is 13.49 points with a standard deviation of 5.63 points. The results of the t-test indicate the difference in total score between youth without child welfare history and youth with child welfare history is statistically significant ($t = -2.54$, $p < .05$).

How do status youth and juvenile justice-only youth differ across AUC overall scores and across risk domains?

To answer the next research question, AUC tests were used to assess differences in the OYAS-DIS total score and domains ability to predict recidivism across the two groups. OYAS-DIS domains include history, family, peers, education, prosocial, substance, and values. As seen in Table 7, the AUC coefficient for total score and each corresponding domain in the OYAS are significant, $p < .05$, predictors of recidivism for juvenile justice-only youth. The AUC value for total score was .66, the value for history was .56, the value for family was .60, the value for peers was .61, the value for education was .62, the value for prosocial was .62, the value for substance was .60, and the value for values domain was .59. Total score, history, family, peers, prosocial, substance, and values were not significant for the dual-status subsample. The AUC coefficient for the education domain for dual-status youth was .67 and was significant, $p < .05$.

How do dual-status youth and juvenile justice only boys and girls differ across AUC scores and risk domains?

A consistent story is seen in the next research question which examines differences in the OYAS-DIS total score and domains' ability to predict recidivism across gender for dual-status and juvenile justice-only youth. As seen in Table 8, for youth without a child welfare history, the OYAS-DIS total score, history, family, peers, education, prosocial, substance, and values domains do well in predicting recidivism for boys. These were all significant, $p < .05$. The AUC value for total score was .67, the value for history was .58, the value for family was .60, the value for peers was .62, the value for education was .62, the value for prosocial was .62, the value for substance was .61, and the value for values domain was .60. For juvenile justice-only girls, OYAS-DIS total score, family, peers, education, prosocial, substance, and values domains do well in predicting recidivism. These were all significant, $p < .05$. The AUC value for total score

was .63, the value for family was .61, the value for peers was .57, the value for education was .64, the value for prosocial was .59, the value for substance was .56, and the value for values domain was .58. However, the history domain doesn't appear to be as useful for predicting recidivism for juvenile justice-only girls. The AUC coefficient was .51 and not significant, $p > .05$. For dual-status youth, Table 9 presents their results. Once again, the education domain is the only significant predictor of recidivism for boys and girls with child welfare history. For boys, the AUC coefficient was .65 and for girls the AUC coefficient was .70. Both were significant, $p < .05$. Total score, history, family, peers, prosocial, substance, and values were not significant for dual-status boys or girls.

What is the main effect of child welfare status on treatment outcomes?

Prior to conducting the main analysis, a multinomial logistic regression, to answer the final research question in part 1, Cook's D was used to test for outliers. The low Cook's D values across all observations suggested that there were no single data points that significantly impacted the regression coefficients. As such, the analysis was continued with the assumption that there were no outliers. A multicollinearity check was also done to ensure that none of the independent variables in the model were significantly correlated. The results of the matrix, depicted in Table 10, indicate that multicollinearity was not an issue. Additionally, the variance inflation factor (VIF) command was employed. As a general rude, multicollinearity is not an issue if VIF is no larger than 10 (Alauddin & Nghiemb, 2010). With scores below 10, and averaging 1.02, the analysis proceeded with this assumption met. The assumption of a linear relationship between continuous variables and the logit transformation of the outcome variable was also tested. For this analysis, age was the only continuous variable. After fitting the model,

the predicted probabilities for each outcome category of dispositions received was calculated. Scatter plots were then employed to inspect the relationship between age and the predicted probabilities of each outcome category in the dispositions received variable. The relationship appears to be linear, meaning the assumption was met. Other assumptions for performing this test including independence of observations and mutually exclusive outcome categories are also met.

A multinomial logistic regression was then used to answer the next research question which seeks to predict disposition outcomes for youth. The results are depicted in Table 11. The likelihood of receiving programs only, or probation only, or both programs and probation was compared to the baseline treatment of no programs or probation. The difference in likelihood for getting programs only and probation only instead of no probation or programs is not statistically significant for youth without child welfare history and youth with child welfare history ($p > .05$). However, the odds ratio associated with receiving both programs and probation compared to no programs or probation was .27 for neglected youth compared to youth without child welfare history ($p < .05$). The findings suggest that neglected youth have significantly lower likelihood of receiving both programs and probation. Interestingly, girls are less likely to get nothing every step of the way compared to boys. For girls, the likelihood of getting programs only instead of no probation or programs decreased by 29% compared to boys ($p < .05$). The likelihood of getting probation only instead of no probation or programs decreased by 27% compared to boys ($p < .05$). Finally, the likelihood of getting programs only instead of no probation or programs decreased by 68% compared to boys ($p < .05$).

Part 2: Recidivism Outcomes

What is the moderating effect of treatment outcomes on child welfare status and recidivism?

The assumptions for the next logistic regression test have been largely met. First, each observation is independent of the other. Additionally, previous diagnostics have shown there are no influential outliers or multicollinearity for the variables of interest. The assumption of a linear relationship between continuous variables and the logit transformation of the outcome variable was again tested, this time on recidivism. Age again was the only continuous variable. This assumption was tested after fitting the regression model with the predictors and outcome variable. To test this, interaction terms were generated between age and its logarithm, then the model was ran again with the interaction term. For juvenile justice-only youth, the interaction was significant ($p < .05$), suggesting a violation of the linearity assumption that the relationship between age and recidivism is linear. For dual-status youth, the interaction was not significant, ($p > .05$), indicating the assumption of linearity was satisfied for this group.

The results of the regression model can be found in Tables 12 and 13. For both tables, the likelihood of receiving a new petition after receiving programs only, or probation only, or both programs and probation was compared to the baseline disposition of no programs or probation. For youth without a neglect petition, the odds of having a new petition within one year is 1.79 times higher for those who receive probation only, compared to no probation or programs. For youth without a neglect petition, the odds of having a new petition within one year is 1.72 times higher for those who receive programs only, compared to no probation or programs. Finally, for youth without a neglect petition, the odds of having a new petition within one year is 1.99 times higher for those who receive both programs and probation, compared to

no probation or programs. Type of treatment received does not appear to significantly predict recidivism for youth with a neglect petition.

What are the differences in time at risk for dual-status and juvenile justice system-only youth?

This analysis aimed to estimate the time to a new petition for dual-status and juvenile justice-only youth. Initially, 3,133 youth were in the sample. However, 13 were excluded due to their assessment date occurring before the start of the study period. This left 3,120 youth for the analysis. Of these youth, 1,585 experienced the event of interest during the study period. The remaining did not and were censored. The Nelson-Aalen cumulative hazard estimate is depicted in Figure 2. This curve estimates the cumulative hazard function, which is the cumulative risk of experiencing the event over time. It represents a cumulative measure of the hazard rate over time, represented as a step function that increases with each event. The figure depicts a curve that starts at 0 and increases over time then steadily flattens. The y-axis depicts the cumulative hazard, while the x-axis shows time. The curve depicted for the present analysis suggests an initial increase in the likelihood of receiving a new petition over time, with less increase in new petitions as time goes on.

Several log-rank tests for categorical variables were conducted to compare the survival distributions for youth in the study. Lower p-values in these tests indicate more evidence to keep the various covariates in the final model. The log-rank test for sex showed a statistically significant difference in survival functions between males and females ($\chi^2 = 4.13$, $p = 0.0422$). This indicates that the survival experience differs significantly between males and females. The log-rank test for race revealed a highly significant difference in survival functions ($\chi^2 = 74.19$, $p < 0.0001$). This indicates that the survival experience differs significantly between nonwhite and

white individuals. The log-rank test for risk level indicated significant differences among low, moderate, and high-risk groups ($\chi^2 = 237.79$, $p < 0.0001$). This indicates that the survival experience varies significantly across different risk levels. The log-rank test for crime type also showed a significant difference ($\chi^2 = 13.20$, $p = 0.0003$). This indicates that the survival experience differs significantly between individuals with non-violent and violent crime types. The log-rank test for different dispositions received was significant ($\chi^2 = 19.76$, $p = 0.0002$). This indicates that the survival experience differs significantly depending on the type of disposition received. The log-rank test for receiving a neglect petition showed a significant difference ($\chi^2 = 8.56$, $p = 0.0034$). This indicates that the survival experience differs significantly between those who received a neglect petition and those who did not. Finally, a log-rank test would not be appropriate to use for age as it is a continuous variable. To examine if age should be included in the final model, a cox regression with age predicting new petition was used instead. The results indicated that age is also a significant predictor of the time to filing a new petition for youth in the study (β = -.27, $p = .000$).

Following these tests, a Cox proportional hazards model using the Breslow method for ties was employed on the final model. To reiterate, the model included 3,120 youth with 1,585 failures. The model was significant ($LR\chi^2 = 627.76$, $p < .0001$), indicating the covariates in the model significantly predicted the hazard of experiencing a new petition. Survival curves for each variable of interest can be found in the Appendices (see Figures 2-9). Results indicated that females exhibit a lower hazard (better survival) compared to males. In other words, boys were more likely to recidivate faster, compared to girls. The coefficient for sex was -0.189 (SE = 0.065, $z = -2.88$, $p = 0.004$). Similarly, White youth demonstrate better survival outcomes

compared to nonwhite youth. Nonwhite youth were more likely to recidivate faster, compared to White youth. The coefficient for race was -0.323 (SE = 0.059, z = -5.48, p < 0.0001). The findings also emphasize the influence of risk level and age on survival outcomes. Moderate and high-risk youth have substantially higher hazards (worse survival) compared to low-risk youth. In other words, compared to other risk classifications, high risk-youth were more likely to recidivate faster, followed by moderate-risk youth. Compared to the low-risk group, the moderate-risk group had a coefficient of 0.670 (SE = 0.059, z = 11.43, p < 0.0001), and the high-risk group had a coefficient of 0.944 (SE = 0.072, z = 13.07, p < 0.0001). Additionally, older age is associated with better survival outcomes. Younger youth are more likely to recidivate faster, compared to older youth. The coefficient for age was -0.275 (SE = 0.016, z = -17.74, p < 0.0001). Youth with a violent petition exhibit better survival outcomes compared to those with a nonviolent petition. The coefficient for crime type was -0.226 (SE = 0.052, z = -4.35, p < 0.0001). Regarding dispositions, receiving both programs and probation is associated with better survival outcomes compared to no programs or probation. Youth that received no programs or probation were more likely to recidivate faster than youth that received both programs and probation. Compared to individuals who received no probation or programs, those who received both programs and probation had a coefficient of -0.325 (SE = 0.073, z = -4.45, p < 0.0001). The analysis suggests a slightly higher hazard (worse survival) for neglected youth compared to non-neglected youth, although this effect is not statistically significant. The coefficient for receiving a neglect petition was 0.084 (SE = 0.115, z = 0.73, p = 0.463).

In survival analysis, one key assumption is that hazard ratios are proportional over time. This means that the effect of covariates on the hazard is constant (UCLA Statistical Consulting

Group, 2021). Testing the proportional hazards assumption is crucial for validating the model. This test was done for the present analysis by creating a cox regression model that includes time-varying covaries (tvc). TVS are the interactions of the original covariates with the log of time (ln(_t)) (UCLA Statistical Consulting Group, 2021). If the interaction terms are statistically significant, it suggests the proportional hazards assumption may not hold for the given covariates. The results indicated that the proportional hazards assumption holds for sex, race, and crime type. However, it does not hold for age, risk level, and dispositions received, specifically for both probation and programs. These variables were transformed in order to examine how the manipulation would impact the findings. Age was first squared, then cubed, and finally grouped by early (11-13), middle (14-16), and late (17-18) adolescence. Nonetheless, the significant result held across all transformations. Risk level was replaced with total score; however, the violation was upheld. The variable was then regrouped so that low and moderate risk youth were combined, and high-risk youth were in a separate category. Following this transformation, the proportionality assumption was no longer violated. Finally, the disposition variable was combined so that any type of treatment received was grouped and no treatment at all was grouped separately in a disposition yes or no variable. The test for proportionality was still significant despite this transformation. These findings suggest that the interpretation for the effects of variables age, risk level, and dispositions received are time dependent. If risk level is transformed in a manner described above however, this is no longer the case.

What are the differences in recidivism rates between dual-status and juvenile justice system-only youth after matching on key demographic characteristics and general risk factors?

The first step in completing this analysis was to run a logistic regression analysis to estimate the probability of a youth being dual-status given the covariates in the model. Results showed that youth that received higher scores across history, prosocial, values domains were more likely to be dual-status (see Table 15). Additionally, age and sex were significantly associated with the likelihood of being neglected. A one-unit increase in "age" decreases the log-odds of being neglected by approximately 0.17 units. Being female increases the log-odds of being neglected by approximately 0.44 units. The results also indicate that the predictors family, education, peers, substance, race, and crime type are not significantly associated with the likelihood of being a dual-status youth.

After obtaining propensity scores for each youth, the overlap assumption was tested to examine the validity of the comparisons. The overlap assumption is crucial to propensity score matching and it states that each individual in the control group should have a non-zero chance of receiving treatment (Guo & Fraser, 2014). This assumption ensures that individuals in the control and treatment group are similar regarding their propensity scores. Figure 10 presents the propensity score distributions for the two groups. The figure illustrates the extent to which the propensity scores for juvenile justice-only youth overlaps with the propensity scores of dual-status youths. The results highlight considerable overlap in propensity scores, suggesting youth in the control group had a non-zero chance of being selected to be in the treatment group, satisfying this assumption. For each dual status youth, there are juvenile justice-only counterparts with similar scores.

Finally, the PSM was conducted using nearest neighbor matching with a caliper of .05. A caliper set to .05 is considered conservative and reduces the chances of getting a type 1 error

(Guo & Fraser, 2014). Youths were matched on age, race, sex, crime type, as well as the history, family, education, peers, prosocial, substance, and values domains. Matches were obtained for 133 youth in the sample of dual-status youth. Tables 16 and 17 presents the results of the t-tests comparing the two groups on the covariates used in the study before and after the matching process. Before matching the youth, there were differences between dual-status and juvenile justice-only youth in age and sex, as well as the history, family, prosocial, and values domain. After matching, there were no differences. Notably, several caliper levels were explored with the goal of balancing the two groups on all variables included in matching. The technique described above provided the best option for balancing the covariates. Table 17 also displays the reduction in bias that was achieved through the match procedure. This is determined by the change in standardized residuals prior to and post matching. The standardized residuals are computed by dividing the difference in mean by the pooled standard deviation. Given this, larger reductions suggest matching allowed for the two samples to become a lot more similar on a variable (Rosenbaum & Rubin, 1985). The results indicate that PSM was a useful mechanism to create statistically similar groups.

The final step of the analysis included comparing recidivism rates for dual-status youth and juvenile justice-only youth after matching was completed. The average treatment effect of the treated (ATT) was used to analyze this. In this context, ATT provides insights into the expected effect of being dual-status on recidivism. As seen in Table 18, in the unmatched sample, neglected youth were significantly more likely to have a new petition (48%) compared to non-neglected youth (38%). The differences were statistically significant ($x2 = 49.77$, $p < .05$, $df = 1$). After the one-to-one matching, recidivism rates for the control group was 42% and 48%

for the dual-status group. After matching, the difference was not statistically significant. In other words, while there was a significant difference in rates of recidivism before matching, the initial difference was likely due to confounding variables. Once these variables were controlled for, the true effect of neglect status on recidivism is not significant. This does indicate that the covariates that were used in the model for the matching process effectively balanced the groups, removing any bias that was present before the matching process.

One noteworthy limitation of PSM is omitted variable bias (Apel & Sweeten, 2010; Rosenbaum, 2002). In the matching procedure, if the covariates that are significantly related to the outcome (in this case, recidivism) are not included in the model, hidden bias may influence the results. Using Rosenbaum's (2002) method, a sensitivity analysis was performed examining sources of potentially hidden bias. This analysis calculates the likelihood that omitted variables could influence the final results using a gamma statistic. Values that are closer to 1 suggest the observed effect would be explained by variables that were omitted (Rosenbaum, 2002). The results returned a gamma value of 1.6, meaning while omitted variable bias is a concern, they are unlikely to significantly influence the final results. Notably, the bound estimate does not explicitly indicate whether omitted variables exist, rather it calculates how large the hidden bias would need to be to affect the results (Duwe & Goldman, 2009; Rosenbaum, 2002).

DISCUSSION

This discussion will review and provide a comprehensive analysis of the key findings from the current study. Additionally, it will offer reflections that can foster rehabilitation and promote positive development for youth. By examining the results in greater detail, the discussion aims to identify gaps and strategies that can be implemented to support the well-being and growth of juvenile justice-only youth and dual-status youth. The reflections below consider a range of factors, including psychological, social, and educational, in order to ensure a holistic approach and understanding of youth's risks and needs.

What are the demographic differences between dual-status youth and juvenile justice system-only youth?

It was hypothesized that dual-status youths will be demographically different from youth only involved in the juvenile justice system. Various studies suggest dual-status youths are different demographically and in delinquent behaviors compared to youth only involved in the juvenile justice system (e.g., Herz et al., 2010). The findings from the current analyses provide a multifaceted understanding of the differences and similarities between dual-status youth and juvenile justice-only youth. For example, there were no significant differences between the two groups across race, crime type and risk level. However, there were significant differences across the two groups across other variables including sex, recidivism, age, total score, and dispositions received. Specifically, there were more males and fewer females in the dual-status group than the juvenile justice-only sample. Dual-status youth had a higher chance of receiving a new petition compared to juvenile-justice only youth. On average, the dual-status population is younger and total score is higher for this group. Finally, dual-status youth were

also less likely to receive probation only or both programs and probation compared to juvenile justice-only youth. These differences underscore the distinct characteristics and potentially unique needs of dual-status youth.

Gender

The overrepresentation of males in the current study aligns with findings from prior literature (Herz et al., 2019; Campbell et al., 2023). In the dual-status population, it has been noted that boys often realize the onset of delinquent activity at a younger age than girls (Campbell et al., 2023; Lee & Villagrana, 2015). The earlier onset of delinquency for boys may be a reflection of differential behavior patterns or even societal responses to male versus female victimization. Scholars have found that boys are more likely to express their traumatic experiences through externalizing behaviors like aggression and delinquency, whereas girls are more likely to internalize their experiences and may not immediately respond by engaging in delinquency (Manly et al., 2001). If the needs of boys continue to be unmet, they may continue to penetrate deeper into the juvenile justice system. Recognizing that boys and girls have different reactions to their victimization can be informative in developing targeted interventions and policies. Boys may benefit from early intervention programs that target behavioral issues and provide support for coping with trauma. These types of treatment can support emotional regulation and allow them to develop and embrace strategies that help them deal with their trauma in constructive ways.

Although males are generally overrepresented in the dual-status population, scholars have noted that the proportion of females is increasing and exceeds that of their representation in the juvenile justice-only population (Herz et al., 2021; Campbell et al., 2023).

Females account for 51% of the general population but comprise of 28% of all delinquent cases and 29% of all juvenile arrests nationwide (Sickmund, 2017). However, in the child welfare system, females represent 51% of victims (Child Welfare Information Gateway, 2017). Over time, their representation in both systems continues to rise (Ryan et al., 2011). Additionally, the increased rates of females in both the juvenile justice and child welfare system is compounded when considering the intersection of both gender and race. In other words, these increased rates have been partially attributed to the increasing numbers of Nonwhite girls in the dual-status population (Ryan et al. 2011). For example, one Los Angeles study reported that 80% of Black girls that received a petition to the juvenile court had interacted with the child welfare system (Herz et al., 2021). Understanding such dynamics will be crucial for better understanding these youths' pathways into delinquency, particularly as research has found these pathways vary across gender for those that experienced maltreatment. Compared to boys, girls are more likely to name their victimization experiences as an essential factor that contributed to their delinquent behaviors (Belknap & Holsinger, 2006). This finding highlights the varying ways in which trauma and victimization exposure impacts boys and girls. Recognizing gender-specific responses to maltreatment helps ensure both boys and girls receive the support and guidance they need to unpack how they experienced their traumatic events.

Recidivism and Age

Prior literature has consistently highlighted the increased risk of delinquency among youth with maltreatment history. As noted earlier, these youth are 47% more likely to engage in delinquency during their adolescence compared to youth who do not have the same

maltreatment history (Ryan & Testa, 2005). Additionally, other studies have found that these youth are more likely to engage in multiple delinquent acts and face incarceration as adults (Morris & Freundlich, 2004; English, Widom, & Brandford, 2004). A study by Hertz and colleagues (2019) and another by Halemba and colleagues (2011) also found that these youth often times have an earlier onset for delinquent behavior compared to their non-maltreated counterparts, which again supports the results of this study which found that, on average, the dual-status subsample was younger than the juvenile justice only subsample. This literature not only aligns with the findings of the current study that found dual-status youth demonstrated higher recidivism rates, but they also underscore the profound impact of early adverse experiences on a youth's developmental trajectory.

Total score

To further highlight the complex challenges dual-status youths face, the higher total score values for dual-status youth reported in the current study may be the reflection of their increased exposure to risk factors. Research has shown that maltreated youth are more likely to struggle academically, have mental health issues, delinquent peer associations, familial issues, and substance abuse problems (Lederman et al., 2004; Piquero et al., 2005; Lipsey & Derzon, 1998; Kilpatrick et al., 2003). Each of these components are typically captured in a risk assessment instrument, meaning these youths would be more likely to receive overall higher scores on a tool. This confluence of risk factors necessitates holistic approaches to intervention. Systemic failures in providing the necessary support dual-status youth need during these critical developmental periods can increase these youths' vulnerability, which can then lead to cycles of ongoing delinquency and involvement in the justice system. These findings will continue to

highlight the urgent need for trauma informed interventions that are targeted and address both immediate behavioral issues and underlying trauma impacts on youth. Without this, we will likely continue to see worse outcomes in recidivism for this population.

Dispositions

While there is considerable evidence for the heightened risk for delinquency and recidivism for the dual-status population, the mechanism by which this link is created is widely debated. The disproportionate contacts with the juvenile justice system could be the result of actual differences in offending patterns and/or it could be the result of unresolved needs. The literature provides insights into possible disparities in treatment allocation and dispositions received by dual-status youth. For example, Bender (2010) reported that dual-status youth were more likely to be committed into detention compared to youth that were only under the jurisdiction of the juvenile justice system. Conger and Ross (2001) and Ryan and colleagues (2007) also found that these youth are more likely to be detained and placed in group homes rather than receive probation. While the dispositions of interest slightly differ from the current study, there is a consistent finding that these youth are less likely to receive treatment that addresses their needs. These findings suggest that the ways by which these youth are treated in the system may contribute to their increased and continued involvement in delinquent activities.

How do status youth and juvenile justice-only youth differ across AUC overall scores and across risk domains?

Ecological Systems Theory asserts that a child's development is influenced by several environmental factors that range from their immediate setting like their family and school to

broader and cultural contexts like the systems they are involved in (e.g., juvenile justice and child welfare systems). The quality of a youth's interactions in these systems, characterized by mutual communication, trust, and balanced power dynamics significantly impacts a youth's development. For dual-status youth, their outcomes are shaped by multiple layers of the environmental systems by which they are embedded. These systems include interactions youth have in school and other institutional organizations, which often fail to provide them with the necessary support and services.

It was hypothesized that the OYAS-DIS tool would better predict recidivism for juvenile justice youth than dual-status youth. The tool was designed to predict recidivism for general delinquent youth. Youth with dual system involvement were not specifically sampled to test the tool's predictability for the demographic. The results of the AUC coefficients indicate that total score and the corresponding domains of the OYAS-DIS tool predict recidivism for juvenile justice-only youth, but not for dual-status with the exception of education. While this suggests differing efficacy of this tool for the dual-status population, the importance of education is a finding highlighted across all AUC analyses for dual-status youth and requires further attention.

Having a quality education is an important aspect of any child's life. Educational attainment is influential in improving a child's income, health, employment, and housing access and stability (Levin et al., 2007; Cutler & Lleras-Muney, 2006; Lochner & Moretti, 2004). Scholars have found that youth involved in both the child welfare and juvenile justice system face several challenges related to positive educational outcomes (Abbott & Barnett, 2016). These youth often struggle in classrooms and have a higher risk of having a lower GPA, repeat classes, miss school, experience behavior misconduct in school, and be placed in special

education programs (Romano et al., 2014; Stone, 2007; Leiter & Johnsen, 1997). Two studies of dual-status youth found that over half of the sample that were enrolled in school either were not regularly in attendance or were truant; 47% were suspended because of behavioral issues; 49% did not perform academically well; and 21% had some form of learning disability (Herz & Ryan, 2008; Herz et al., 2010). These findings complement the results of the current study which highlight the education domain as important indicators for dual-status youth's outcomes, regardless of gender.

The OYAS-DIS tool evaluates the education domain using items that capture if a youth has ever been suspended from school, suspended from school in the last 6 months, expelled ever, and if the youth has a positive relationship with their current school staff. The increased interactions dual-status youth face with both the child welfare and juvenile justice system often disrupts their education and increase their likelihood for falling through the cracks and expose them to high-risk peer groups (Leone & Weinberg, 2012). This helps us make better sense of the results of this study. When youth are suspended in school or lack positive relationships with school staff, it can increase their risk of engaging in delinquency. Understanding the specific items that encompass the education domain is critical for the development of targeted interventions.

In summary, education is an essential service domain for dual-status youth (Hirsch et al., 2018). Scholars Leone & Weinberg (2012) cite the lack of collaboration and coordination across juvenile justice and child welfare agencies as the main barrier to improving educational outcomes of these youth. Dual-status youth are often overlooked by these agencies, as neither are held accountable for the youth's success. Without this support and centralized advocate,

these youth too often fall through the cracks (Leone & Weinberg, 2012). The application of EST to these findings reveals how dual-status youth's development is profoundly affected by the interaction they have within and between their microsystem and mesosystem. Failure of institutions like the schools, juvenile justice, and child welfare system to provide adequate support exacerbates the challenges faced by these youth. Too often, these institutions lack the coordination to wholistically support youth, leading to fragmented services that fail to address their needs. The importance of the education domain in this study underscores the need for comprehensive and integrated systems that prioritize educational attainment and success. Inability to address these issues faced by these youth lead to outcomes observed in this study. For example, the significant difference in recidivism and total score between dual-status and juvenile justice-only youth aligns with existing literature indicating that dual-status youth are often met with compounded challenges and vulnerabilities, such as instability and trauma, which can elevate their risk profile.

How do dual-status youth and juvenile justice only boys and girls differ across AUC scores and risk domains?

It was hypothesized that the OYAS-DIS tool will predict recidivism best for boys with no maltreatment history. Delinquent boys constituted a majority of the sample used to validate the OYAS. While future studies validated the tool for other demographics, it was initially designed and validated with a specific sample. The findings revealed that the domains on the OYAS-DIS tool predicted recidivism for juvenile justice only boys, but for girls, the history domain was not predictive. This raises important questions regarding the adequacy of the OYAS-DIS tool in capturing the complexity of girls' pathways into delinquency. Several scholars

have discussed the gendered context of the juvenile justice system and how boys and girls experience the system differently. Gendered pathways theory suggests girls' behaviors and their involvement in the juvenile justice system is based on survival and it is tied to their childhood and experiences of abuse, trauma, mental health, and substance use (Belknap & Holsinger, 2006). Additionally, while boys and girls alike who are involved in the juvenile justice system have experienced maltreatment and trauma, authors have cited a higher prevalence of girls experiencing certain types of maltreatment such as sexual and physical abuse (King et al., 2011). A number of studies indicate that the associated risk of behavioral issues is dependent on the type of maltreatment a child experiences (Fang & Corso, 2007; Stewart et al., 2002; Zingraff et al., 1994). Some have reported that youth that have experienced physical abuse are at the highest risk of delinquent behavior (Stewart et al., 2002; Zingraff et al., 1994), while others have attributed sexual abuse victims are more at risk of externalizing (Manly et al., 2001).

The findings from the current study support the idea of a gender-responsive approach in the juvenile justice system. The differential impact of the history domain in predicting recidivism for boys and girls suggests that girls may have unique pathways into and experience of the juvenile justice system. This is often characterized by abuse and trauma and may not be accurately captured in the present assessment tool. It's important that these tools are able to sufficiently account for how these traumatic experiences can influence girls' behaviors and subsequently, their risk for recidivism. Predicting recidivism with the history domain may necessitate a more holistic approach for girls. While prediction for boys may be more straightforward and based on their history of behaviors, girls' pathways appear to be

intertwined with complex trauma and trauma responses that may not align with how traditional risk assessments measure risk. The predictive utility of the history domain, as is, undermines the root causes of future delinquency for girls and does not adequately assess their behavioral patterns. Addressing this will require a shift towards gender-responsive frameworks and adoption of comprehensive assessments that account for both behavioral histories and the impact of trauma and abuse in trajectories.

What is the main effect of child welfare status on treatment outcomes?

The findings also illuminate important considerations for how youth interact with the juvenile justice system once they are adjudicated. It was hypothesized that dual-status youth are more likely to receive treatment and services compared to youth only involved in the juvenile justice system. Building on Campbell and colleagues' (2023) findings that dual-status youth exhibit higher overall risk scores on the OYAS-DIS compared to general delinquent youth, we anticipated that these groups will also show differences in treatment outcomes. The increased risk profile of dual-status youth may necessitate and result in a higher likelihood of receiving treatment and services. However, the findings contradicted this hypothesis. Specifically, there was no significant difference in dual-status youth’s chances of getting programs only or probation only compared to no programs or probation. However, they were significantly less likely to receive both programs and probation compared to juvenile justice-only youth. This finding raises questions about the allocation of resources and support services for dual-status youth. Despite the increased needs, these findings suggest that the juvenile justice system is not effectively coordinating and delivering the interventions needed to address the needs of dual-status youth. Despite the wide options available for interventions and

dispositions in the juvenile court, scholars have found that the most vulnerable populations are still not receiving services that support their needs. For example, one study that examined if racial, ethnic, and gender disparities in punishment and rehabilitation existed in the juvenile court reported there was a consistent pattern of the juvenile court's inclination to treat female offenders in a rehabilitative manner compared to black females, Black males, and Latino males, despite their higher risk and needs profiles (Cochran & Mears, 2015).

The differences in treatment assignment suggest potential systemic shortcomings in recognizing and addressing the complex needs of these youths. As mentioned before, dual-status youth often face significant challenges related to their involvement in two systems, and the lack of comprehensive interventions exacerbates those difficulties. Dual-status youth often exhibit higher rates of substance use, mental health issues, education related challenges, compared to youth only involved in the juvenile justice system (Herz & Ryan, 2008; Herz, Ryan, & Bilchik, 2010; Leone & Weinberg, 2012). One study involving young adults that were previously involved in the juvenile justice system in New York City and Los Angeles highlighted this point further. The study revealed that 94% of those that were dual-status were involved in at least one service such as health services, homeless services, financial assistance, justice services, 80% were involved in two or more, and 50% were involved in three or more (Culhane et al., 2011). Another report estimated that on average, the cumulative cost of service usage for dual-status youth was $65,424 compared to $47,854 for justice-only group (Center for Innovation Through Data Intelligence, 2015). These studies underscore the high levels of need among the dual-status population, despite studies that report results such as the current one

that indicate the allocation of services to these youth is still lacking. The unaddressed and unmet needs often lead to poorer outcomes for youth.

One final noteworthy finding from this analysis was that compared to boys, girls were less likely to receive programs only, probation only, and programs and probation. This finding contradicts the paternalistic perspective of the juvenile court which suggests decision makers aim to control girls' behaviors rather than target their underlying issues. The lack of treatment girls received in this study could still be reflective of systemic biases towards girls' delinquent behaviors, which are either overlooked or overly controlling. Given the increasing proportion of girls in the juvenile justice system (Leve et al., 2015), more attention should be given to developing, testing, and implementing evidence-based models and interventions for this group. Although there is considerable knowledge in the literature regarding risk and protective factors for girls, there are still significant gaps in intervention efforts that target rehabilitation for justice-involved girls. Research has found that former delinquent girls that do not receive intervention experience significant issues as adults (Leve et al., 2015). Silverthorn and Frick (2011) and Pajer (2014) found that delinquent girls with unaddressed behaviors faced poorer outcomes in adulthood such as substance abuse, increased adult arrests, and mental health disorders. This persistence of troubled behaviors can even be passed down if not properly addressed. In a 25-year longitudinal study, Werner and Smith (1996) reported that women that were delinquent in their youth had higher rates of family court records than women that were not delinquent. These women also faced more psychiatric issues. Chamberlain and Moore (2002) attribute this to the intergenerational transmission of problems like mental health. These scholars suggest mothers that struggle with their mental health are not able to

adequately parent their children, thereby introducing cycles of neglect and abuse. For female delinquents, the juvenile justice system offers a crucial opportunity for intervention to address these issues and break this cycle. Therefore, efforts to target justice-involved girls can achieve rehabilitative goals in several problem areas of a youth's life, not just criminal recidivism.

Part 2: Recidivism Outcomes

What is the moderating effect of treatment outcomes on child welfare status and recidivism?

It was hypothesized that disposition received would effect recidivism for both the juvenile justice and dual status population. It was anticipated that this relationship would be stronger for juvenile justice-only youth. Based on prior research, it was expected that youth who receive any programs and services that target their criminogenic needs will exhibit a lower likelihood of recidivism compared to those who receive no intervention at all. This expectation holds for both youths with a child welfare history and those without. Given the lack of attention to maltreatment history as a responsivity factor to treatment, however, it was anticipated that youth without maltreatment history will have better outcomes. Interestingly, the results showed that juvenile justice-only youth that received probation only, programs only, or both probation or programs were more likely to have a new petition within one year compared to those that did not receive anything. For dual-status youth, the type of disposition received did not have any significant impact on whether they had a new petition within a year or not. In other words, we are neither helping nor hurting the dual-status group. This a very counterintuitive finding and it suggests the current interventions used to treat these youth may not be effectively mitigating the risk factors associated with the root causes of their behaviors.

This finding also raises critical questions about the design and implementation of these interventions.

The variables capturing dispositions in this study include all options provided for programming including community and residential programs, vocational training, cognitive behavioral therapy, faith-based treatment, family-focused treatment, mindfulness training, programs designed for sex offenders, substance abuse treatment, mental health services, educational training, advocacy or mentoring, and programs focused on reentry. There is a breadth of literature supporting these treatments for different types of youth. This raises the question then of, if it's not the program being offered, why were all these youth coming back faster than those that received nothing at all? An explanation for this could be found by taking a closer look at how decision makers use the results of risk assessment instruments to inform intervention and treatment decisions.

Juvenile risk and needs assessments have played a vital role in the implementation of evidence-based practices within the juvenile justice system. Researchers have found these tools to be crucial to improving decision-making processes, improve youths outcomes, and reduce recidivism (Nelson & Vincent, 2018). These tools are intended to be used as guide throughout the juvenile justice process starting at intake to later stages (Mears, 2012; Baglivio et al., 2015). The results of these assessments should also be used to match youths with the appropriate supervision levels given risk and services given needs (Andrews & Bonta, 2010; Vieira et al., 2009). Finally, adherence to these assessments and this process should then result in reductions in recidivism compared to cases that do not use the assessments to guide decision making.

Several scholars have investigated how this operates in practice. Viera and colleagues (2009) examined whether practitioners matched youths with services that aligned with criminogenic needs, as well as responsivity factors as determined by a juvenile risk and needs assessment. The authors found that doing so resulted in reductions in both risk and recidivism (Viera et al., 2009). For youth that were provided with treatment that did not address their criminogenic needs, they were more likely to reoffend earlier and more frequently. Baglivio and colleagues (2014) found that overrides by stakeholders and placements that were below or above recommended sanctions increased rates of recidivism for youth. The authors found that decision makers were more likely to deviate for the high-risk group, providing them with the lowest adherence to recommendations. Another study by Baglivio and colleagues (2018) concluded that youth that received appropriate treatment, where decisionmakers provided youth with the recommended levels of dosage and duration, had significantly lower recidivism. These findings were consistent with youth that had experienced extensive maltreatment histories (Baglivio et al., 2021).

The findings from the current study suggest there may be a gap in use of the OYAS tool in informing case management and placement decisions. This conclusion is even more corroborated by an article by Petkus and colleagues (2022) that specifically looked at record data to examine disposition decisions associated with the OYAS. The authors reported that the assessment was inconsistently used to inform treatment decisions. While these assessments have been integral to the implementation of evidence-based practices in the juvenile justice system, their effectiveness is significantly limited when adherence to the recommendations are undermined.

What are the differences in time at risk for dual-status and juvenile justice system-only youth?

In the analysis of survival time, it was hypothesized that dual-status youths would recidivate faster than juvenile justice-only youth. The rationale for this was that due to the absence of a unique assessment for dual-status youth, the programs and services offered may not comprehensively address the factors influencing their recidivism outcomes. It is anticipated that the inadequacy in assessment will lead to insufficient services, which will result in poorer outcomes for dual-status youth, contributing to a faster rate of recidivism among this population compared to those exclusively involved in the juvenile justice system. While the analysis did not yield significant differences in hazard rates for dual-status and juvenile justice-only youth, there were significant differences across other variables. White, low-risk, older youth with violent petitions who received both programs and probation had better survival outcomes than nonwhite, moderate or high risk, younger, nonviolent youth that received no programs or probation. These findings carry important implications regarding the effectiveness of the juvenile justice system for different subgroups.

Different demographics of youth are more likely to interact with the juvenile justice system. For example, in 2020, younger youth (10-15) accounted for over half of delinquency petitions in the United States (Puzzanchera & Hockenberry, 2020). Additionally, an abundance of literature has documented the disproportionate number of youths of color in the juvenile justice system. Nonwhite youth account for 34% of the United States population, but 62% of those adjudicated in the juvenile court. Additionally, African American youth were detained 2.5 times more than Hispanic youth and 5 times more than White youth (Office of Juvenile Justice and Delinquency Prevention, 2018). These youth are more likely to be under supervision and

have continued involvement in the system (Crosby, 2016), despite being at lower risk for committing violent offenses than their White counterparts (Desai et al., 2012). While most youth show some level of non-normative and violent behavior at some point in their life, only 6% of the juvenile population become persistent repeat violent offenders over their life course (Bevilacqua et al., 2018; Fonagy, 2003; Ibabe et al., 2013; Loeber et al., 1991, 1995; Moffitt, 1993; Rhoades et al., 2016; Rutter et al., 2000; Zemel et al., 2021). Given prior research, it is not surprising that nonwhite, moderate or high risk, younger, nonviolent youth that received no programs or probation are coming back faster, especially when considering prior findings that reported that overrides on treatment recommendations were less likely to occur for low-risk youth (Baglivio et al., 2014).

While initial hypotheses regarding dual-status youths recidivating faster than juvenile justice-only youth was not supported by the findings, the significant differences across other variables emphasize the need for more equitable and effective responses from the juvenile justice system. The findings highlight systemic biases that have been shown in prior literature and appear to persist over time. Biases with school officials, juvenile courts, and social service agencies can lead to differential treatment based on a youth's race, sex, age, and other demographic factors (Heldman & Gaither, 2021). For example, research on disproportion minority contact has demonstrated that youths of color, particularly African American and Hispanic youths are more likely to be detained, arrested, and adjudicated (Office of Juvenile Justice and Delinquency Prevention, 2018). These youth are also more likely to be surveilled compared to other youth (Kelly, 2000), giving the skewed perspective that they are more likely to participate in delinquent activity. These types of biases are also compounded by structural

inequalities in access to resources like legal representation. The current state of the juvenile justice system does not effectively address the needs of all youth. By working to address these issues, the system can better serve all youth, reduce recidivism, and promote positive development.

What are the differences in recidivism rates between dual-status and juvenile justice system-only youth after matching on key demographic characteristics and general risk factors?

In an attempt to further examine the similarities and differences between dual-status and juvenile justice-only youth, a PSM analysis was conducted to evaluate recidivism rates after matching. It was hypothesized that even after matching, neglect status will still have a significant effect on recidivism outcomes. Neglected youth have various risks and needs that is not adequately identified and treated in the juvenile justice system. Without these targeted interventions, they will continue to have poor outcomes compared to their non-neglected counterparts. The results revealed that while it initially appeared that dual status youth had a higher chance of receive a new petition in one year, after controlling for confounding variables, there were no significant differences in likelihood of recidivism for the two subsamples. This outcome is still noteworthy as it suggests that the matching process that was conducted controlled for the confounding variables that could inform the outcome of interest, allowing for a full comparison between the two groups. The removal of these differences post-matching indicate that when similarly situated youth are compared, the effect of neglect status is not as influential as initially perceived.

While the findings suggest dual status label itself does not inherently result in different outcomes for youth, but rather characteristics of youth that result in differences, there are still

important connections to draw. The findings prior to matching suggest there are characteristics of dual-status youth that initially make them at higher risk for recidivism. This includes factors such as higher prevalence of complex family dynamics, socio-economic disadvantages, and adverse childhood experiences (Belknap & Holsinger, 2006; McPhie et al., 2014). While the PSM analysis revealed that once these factors are accounted for, maltreatment alone is not predictive of recidivism, it does suggest that interventions do need to target these specific issues. It's not that the youth is labeled "dual-status" or had a formal petition to the child welfare system that makes them at higher risk for recidivism, it's increased complex challenges they face. The goal isn't to address the label, it is to address the needs.

The Crossover Youth Practice Model (CYPM) is also a noteworthy practice that should be mentioned. The CYPM was developed in part to address the issues the juvenile justice system and child welfare system have in addressing the core problems that result in dual involvement. The primary goal of the model is to enhance delivery of treatments and services for dual-status youth. CYPM works to identify these youth, help coordinate and inform the decisions made by the two agencies regarding the youth and provide evidence-based services that divert youth from further involvement in the systems. To do this, the model highlights the need for collaboration and provides techniques that can inform decision making between the two agencies to better serve dual-status youth. The CYPM offers a promising framework for improving outcomes for dual-status youth. Rather than neither helping nor hurting youth, this model can be used as a guide to improve strategies for intervention and make meaningful changes in a youth's trajectory.

Conclusion

This section will review limitations, potential avenues for future child welfare and juvenile justice research, and policy implications. The chapter attempts to transparently identify issues with the current project, while also offering practical approaches to improve the work. By addressing these aspects, the chapter offers more insights into the complexity of the dual-status experience and the need to continue this work and improve on current policies and practices.

Limitations

Beyond the unmet assumptions highlighted above, there are a few other noteworthy limitations. First, Central Limit Theorem tells us that the larger the sample size generally, the more likely it is that the estimate will represent the population and the lower that standard error should be. The confidence intervals are a reflection of this. The intervals, for dual-status youths specifically for the AUC analyses could be considered wide. This is likely partially attributed to the smaller sample size. There may not be enough power to find significant differences when there may have been one because the confidence intervals are too wide. Additionally, as with any nonprobability technique, purposive sampling has a few weaknesses. First, drawing a sample aims to create a subset of a population by which inferences can be made about the population (Shadish et al., 2002; Singleton & Straits, 2012). As stated, purposive sampling relies heavily on expert judgment to create samples. These samples are assumed to be representative of the population (Singleton & Straits, 2012). The sample's representativeness and generalizability of the findings are quickly called into question when utilizing this sampling method. For example, in the present study, all youth had a common

characteristic of being involved in the same medium-sized Midwestern court. This shared characteristic could affect the instrument's predictive validity and the findings' generalizability. Thus, purposive sampling has low reliability. Reliability refers to the consistency in findings and the degree to which they can be generalized to the population of interest. As stated earlier, the best and most helpful risk assessment tools are reliable. They can be utilized across diverse offender groups. The results of this study may not be generalized to youth not involved in the same or similar large midwestern court. Youth in other cities may experience different circumstances that could alter findings in their respective areas. Not only is the data very narrowly focused, but the analyses run to study the research question in this study are also tailored to the sample, with a few assumptions for conducting those analyses having been violated. In short, the results should be examined cautiously.

Another critical limitation is the inherent focus of criminal behavior of youth in tools like the OYAS-DIS. Dual-status youths experience complex histories of trauma and neglect that criminogenic tools do not adequately capture. Consequently, they fail to identify critical needs of this population. This narrow focus on subsequent criminal behavior alone can lead to treatment recommendations that are not sufficient in providing holistic support for dual-status youth. To address this limitation, current tools could be expanded to incorporate components and items that address trauma, allowing for the recognition of its impact on behaviors and development. The inclusion of these items would require an expansion of the RNR model as traditionally used. The model would benefit from incorporating strengthens-based items that assess youths' experiences in totality. Along with this, another limitation to this study is that youth had to be grouped into broader classifications of treatment or no treatment for a few

questions or programs only, probation only, both, or neither for others. This was due to insufficient sample sizes. Several programs were grouped together, and the analysis did not allow for an depth look at the effects of each type of treatment. More meaningful insights could have been drawn about the effects of specific dispositions if sample sizes were larger. Despite the limitations, the findings set a foundation for future research and have several implications.

Future Research for Child Welfare

Future research has the potential to advance understandings of this population and interventions that work for them by integrating comprehensive trauma assessments and trauma-informed measures (Baglivio et al., 2014; Moore & Tatman, 2016; Van der Put & De Ruiter, 2016). Specifically, several key areas should be addressed. First, it is important to continue examining the role of maltreatment experiences on a youth's outcomes. More specifically, this research should acknowledge the role of different forms of maltreatment – physical abuse, sexual abuse, emotional abuse, neglect, exposure to domestic violence – youth may experience, and recognize how each type can uniquely and collectively influence child development. In doing this, research can better delve into the complex and interrelated nature of these experiences. Second, the frequency and severity of these experiences is critical. Research should distinguish between isolated and chronic events. This nuanced understanding can help identify specific conditions under which youth are most vulnerable to long term impacts. It can also contribute to the development of tailored interventions. Finally, research should incorporate more longitudinal studies that track the outcomes of maltreated youth into adulthood. Such studies will be impactful in understanding the enduring effects of early adverse

experiences, the trajectory of recovery, and factors that contribute to change. This longitudinal perspective will be impactful in creating interventions that support immediate and long-term needs. This would also help expand the limitation described above related to program grouping. With more research on how program and treatment data should be collected, how their effectiveness should be assessed, and how to continue to refine these programs based on what we know about development for people that experience maltreatment.

Future Research for Juvenile Justice

The results from this study highlight several important areas for future research in juvenile justice that can enhance our understanding of dual-status youth and improve their outcomes. First, refining predictive models and assessments for recidivism is essential. The current study detailed the inability of the OYAS-DIS domains to significantly predict recidivism for dual-status youth, with the exception of the education domain. Future studies should work to further unpack why these predictive models differ for this population. This could encourage the use of specific trauma and maltreatment measures in risk tools, which would account for the unique experiences of these youth. Furthermore, having explicit measures that target capturing additional factors that influence recidivism, such as social support systems and mental health would provide a more comprehensive understanding of recidivism risk.

Additionally, future research should continue to compare outcomes of dual-status and juvenile justice-only youth using advanced statistical analyses like propensity score matching. One strength of the current study is the use of PSM to control confounding variables and better compare the outcomes of the two groups. We observed differences between the two groups prior to matching, but the differences did not hold after matching. Given the ethical and

practical constraints that would not allow the use of traditional experimental designs with this population, we must continue to be innovative in how to evaluate their outcomes and understand their experiences. Future research should triangulate data from several sources and employ various analytical techniques to comprehensively understand these youth's challenges and needs.

Policy Implications

These findings also carry significant policy implications. The first, and one of the most important implications, is the need to prioritize the decision-making processes that are data driven and empirically sound based on what we know about youth generally and dual-status youth. Policy makers must continue to invest in collecting, analyzing, and disseminating data that informs decisions about youths' outcomes. Along with that, efforts should continue to be made to enhance the capacity of agencies to use juvenile risk assessments throughout each stage of the juvenile justice system. This will be imperative in ensuring effective treatment for these youth, not just placing them in treatment that is neither helping nor hurting.

Based on the repeated finding of education being a significant predictor of recidivism for dual-status youth, there is a critical need for educational interventions in the comprehensive strategy to support these youth. As such, one policy recommendation is the implementation of educational support systems within the juvenile justice system. These programs should include services such as academic tutoring, special education services, vocational training, as well as courses that help students navigate communication and relationships with school staff and officials. Juvenile justice and child welfare facilities should partner with local agencies and community organizations to help create a continuum of educational support that is within

reach of youth. This could involve the use of individualized education plans based on a youth's needs per the OYAS-DIS tool. These programs should be offered for all youth with high scores across the education domain on the OYAS-DIS tool, the level of treatment will depend on the value of their score. By addressing these educational deficiencies, this can create a pathway to divert youth from further involvement in the juvenile justice system.

These findings and past literature underscore the critical need for improved communication and coordination of efforts between the juvenile justice and child welfare system. Dual-status youth often navigate both systems simultaneously and face challenges that are complex and intertwined, wherein neither system can resolve alone. Policy reforms must prioritize integrative services and establish collaborative frameworks to ensure youth have comprehensive and continuous resources and support. The final recommendation is the establishment of multidisciplinary case management teams specifically for dual-status youths. This team's responsibilities would include coordinating services and support across both the child welfare and juvenile justice systems to help comprehensively meet youths' needs. This team should include professionals from both systems including, but not limited to, probation officers, mental health counselors, educators, family support specialists, and social workers. These teams could also be responsible for the assessment of dual-status youths in which they identify both their risks and develop holistic intervention plans. This collaborative approach would be particularly useful for the coordination of services, and the reduction of duplicative or gaps in service delivery for dual-status youth. Leveraging the strengths of both systems will better promote positive outcomes for these youths.

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Appendix

Figure 1. Bronfenbrenner's Ecological Systems Theory

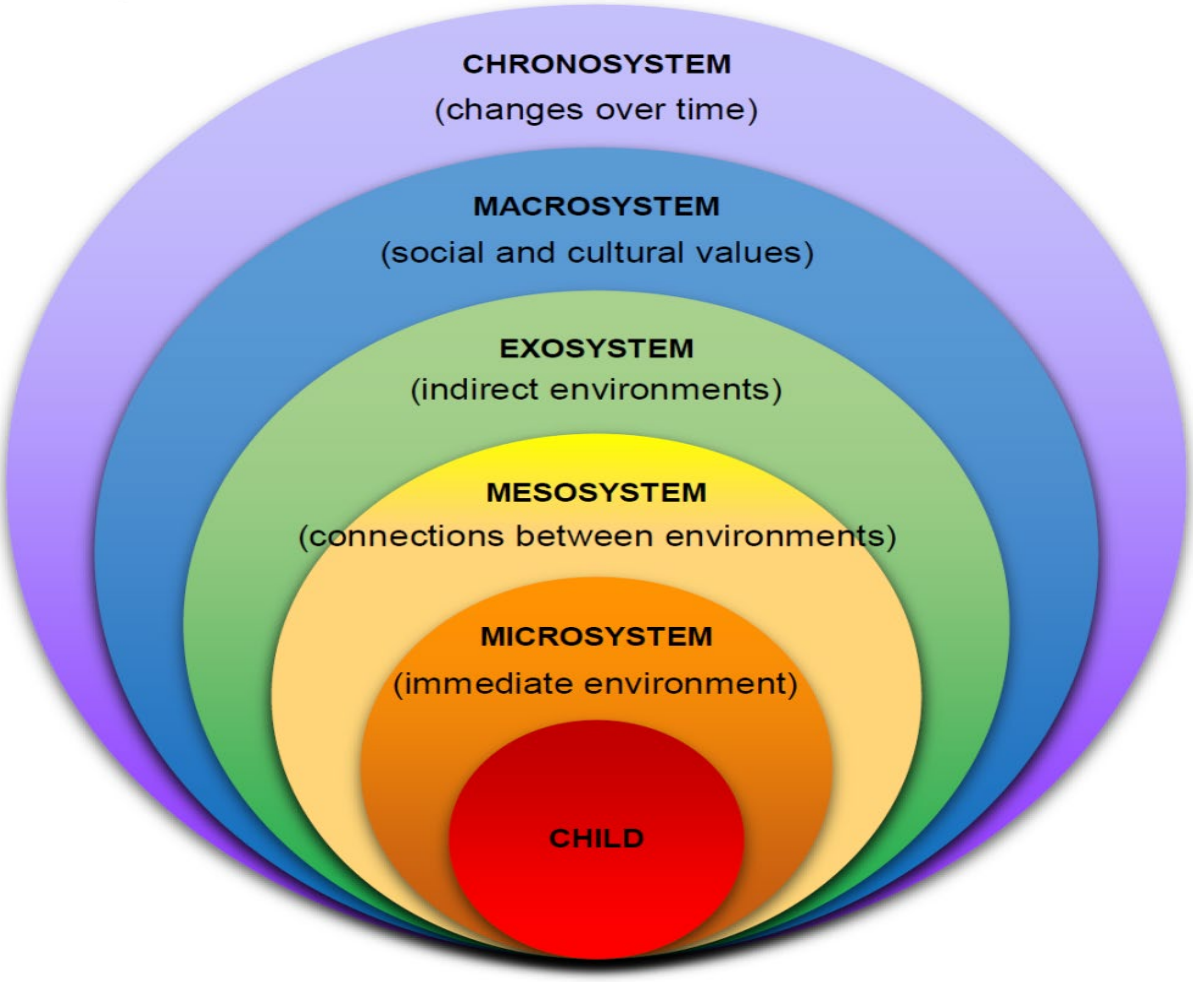

Table 1. Measures in Analyses

Variable	Description
Dependent Variable	
Recidivism	New Petition 1-year recidivism - Whether or not a youth received a new court petition within one year of their initial petition. New Petition ever - Whether or not a youth received a new court petition after their initial petition at any point in time during the study period
Disposition	Types of dispositions (i.e., neither programs nor probation, programs only, probation only, both programs and probation) given to youth.
Independent Variable	
Neglect	Whether or not the youth received a child neglect petition between January 1, 2010, and the date of their initial offense.
Crime type	Dichotomous coding of the most serious charge on the initial petition as being violent or non-violent.
Risk level	This is the risk level associated with the OYAS-DIS total score (risk level cut-off scores can be found in the OYAS-DIS user manual).
Covariates	
Age	Age of youth at initial assessment.
Race	Self-reported race of youth.
Sex	Self-reported biological sex.
OYAS-DIS Domains	
History	Raw score of the Juvenile Justice History domain.
Family	Raw score of the Family and Living Arrangements domain.
Peers	Raw score of the Peers and Social Support Network domain.
Education	Raw score of the Education and Employment domain.
Prosocial	Raw score of the Pro-Social Skills domain.
Substance	Raw score of the Substance Abuse, Mental Health, and Personality domain.

Values	Raw score of the Values, Beliefs, and Attitudes Domain.

Table 2. Summary Statistics of Variables in Analyses

Variable	N	Mean (or Percentage)	Mode	Median	Min	Max	S.D
Recidivism	3,133	--	0	--	0	1	--
No (0)	1,941	(61.95)					
Yes (1)	1,192	(38.05)					
Risk Level	3,133	--	1	--	1	3	--
Low (1)	1,451	(46.31)					
Medium (2)	1,220	(38.94)					
High (3)	462	(14.75)					
Disposition	3,133	--	1	--	1	4	--
Neither (1*)*	1,010	(32.34)					
Programs (2)	953	(30.42)					
Probation (3)	482	(15.38)					
Both (4)	688	(21.96)					
Crime Type	3,133	--	0	--	0	1	--
Nonviolent (0)	1,753	(55.95)					
Violent (1)	1,380	(44.05)					
Age	3,133	15.54	16	16	11	18	1.48
Race	3,133	--	0	--	0	1	--
Nonwhite (0)	2,114	(67.48)					
White (1)	1,019	(32.52)					
Sex	3,133	--	0	--	0	1	--
Male (0)	2,516	(80.31)					
Female (1)	617	(19.69)					

Note: Italicized numbers in parentheses indicate the coding theme.

Table 3. Summary Statistics of Juvenile justice-only youth

Variable	N	Mean (or Percentage)	Mode	Median	Min	Max	S.D
Recidivism	3,000	--	0	--	0	1	--
No (0)	1,872	(62.40)					
Yes (1)	1,128	(37.60)					
Risk Level	3,000	--	1	--	1	3	--
Low (1)	1,396	(46.53)					
Medium (2)	1,169	(38.97)					
High (3)	435	(14.50)					
Disposition	3,000	--	1	--	1	4	--
Neither (1*)*	956	(31.87)					
Programs (2)	911	(30.37)					
Probation (3)	455	(15.17)					
Both (4)	678	(22.60)					
Crime Type	3,000	--	0	--	0	1	--
Nonviolent (0)	1,678	(55.93)					
Violent (1)	1,322	(44.07)					
Age	3,000	15.56	17	16	11	18	1.47
Race	3,000	--	0	--	0	1	--
Nonwhite (0)	2,023	(67.43)					
White (1)	977	(32.57)					
Sex	3,000	--	0	--	0	1	--
Male (0)	2,420	(80.67)					
Female (1)	580	(19.33)					

Note: Italicized numbers in parentheses indicate the coding theme.

Table 4. Summary Statistics of Dual-Status Youth

Variable	N	Mean (or Percentage)	Mode	Median	Min	Max	S.D
Recidivism	133	--	0	--	0	1	--
No (0)	69	(51.88)					
Yes (1)	64	(48.12)					
Risk Level	133	--	1	--	1	3	--
Low (1)	55	(41.35)					
Medium (2)	51	(38.35)					
High (3)	27	(20.30)					
Disposition	133	--	1	--	1	4	--
Neither (1*)*	54	(40.60)					
Programs (2)	42	(31.58)					
Probation (3)	27	(20.30)					
Both (4)	10	(7.52)					
Crime Type	133	--	0	--	0	1	--
Nonviolent (0)	75	(56.39)					
Violent (1)	58	(43.61)					
Age	133	15.08	16	15	11	18	1.59
Race	133	--	0	--	0	1	--
Nonwhite (0)	91	(68.42)					
White (1)	42	(31.58)					
Sex	133	--	0	--	0	1	--
Male (0)	96	(72.18)					
Female (1)	37	(27.82)					

Note: Italicized numbers in parentheses indicate the coding theme.

Table 5. Chi-Square Table of Demographic Variables for Subgroups

Demographic differences				**Juvenile Justice Only**		**Dual-status**	
Variable	**Value**	**df**	**Sig.**	**Observed**	**Expected**	**Observed**	**Expected**
Race	.81	1	.06	--	--	--	--
Nonwhite (0)				2,023	2,024.3	91	89.7
White (1)				977	975.7	42	43.3
Sex	5.80*	1	.02	--	--	--	--
Male (0)				2,420	2,409.2	96	106.8
Female (1)				580	590.8	37	26.2
Crime type	.01	1	.92	--	--	--	--
Nonviolent (0)				1,678	1,678.6	75	74.4
Violent (1)				1,322	1,321.4	58	58.6
Risk level	3.66	2	.16	--	--	--	--
Low (1)				1,396	1,389.4	55	61.6
Medium (2)				1,169	1,168.2	51	51.8
High (3)				435	442.4	27	19.6
Disposition	18.45*	3	.00	--	--	--	--
Neither (1)				956	967.1	54	42.9
Programs (2)				911	912.5	42	40.5
Probation (3)				455	461.5	27	20.5
Both (4)				678	658.8	10	29.2
Recidivism	5.98*	1	.01	--	--	--	--
No (0)				1,872	1,858.6	69	82.4
Yes (1)				1,128	1,141.4	64	50.6

Note: *p < .05

Table 6. T-test Results of Continuous Variables Comparison Between Subgroups

	Youth without child welfare history		**Youth with child welfare history**		
	Mean	***SD***	***Mean***	***SD***	***t***
Age	15.56	1.47	15.08	1.59	3.71*
Total Score	12.21	5.69	13.49	5.63	-2.54*

Note: *p < .05

Table 7. AUC Results of OYAS-DIS Components Across Subgroups

	Youth without child welfare history (n = 3,000)			**Youth with child welfare history (n = 133)**		
	AUC	**95% CI**		**AUC**	**95% CI**	
Total Score	.66*	.64	.68	.57	.47	.67
History	.56*	.54	.58	.55	.45	.64
Family	.60*	.58	.62	.56	.46	.65
Peers	.61*	.59	.63	.53	.44	.63
Education	.62*	.60	.64	.67*	.58	.76
Prosocial	.62*	.60	.64	.44	.35	.53
Substance	.60*	.58	.62	.55	.45	.64
Values	.59*	.57	.61	.51	.41	.60

Note: *p < .05

Figure 2. AUC Results of OYAS-DIS Total Score Across Subgroups

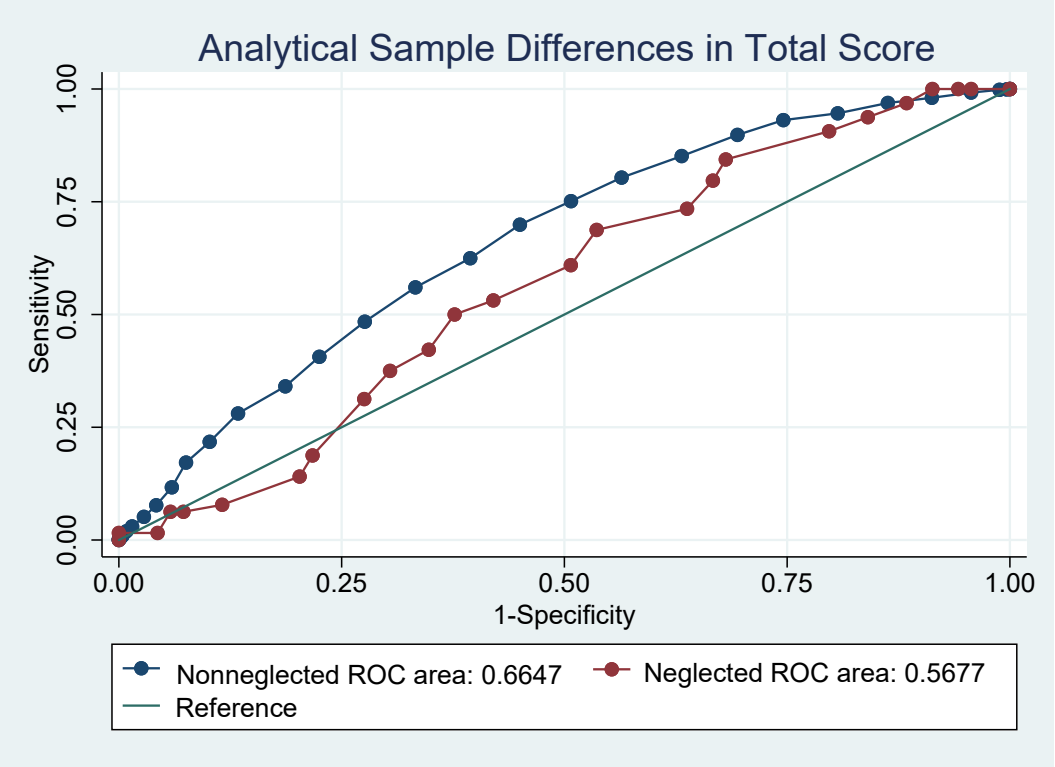

Figure 3. AUC Results of OYAS-DIS History Domain Across Subgroups

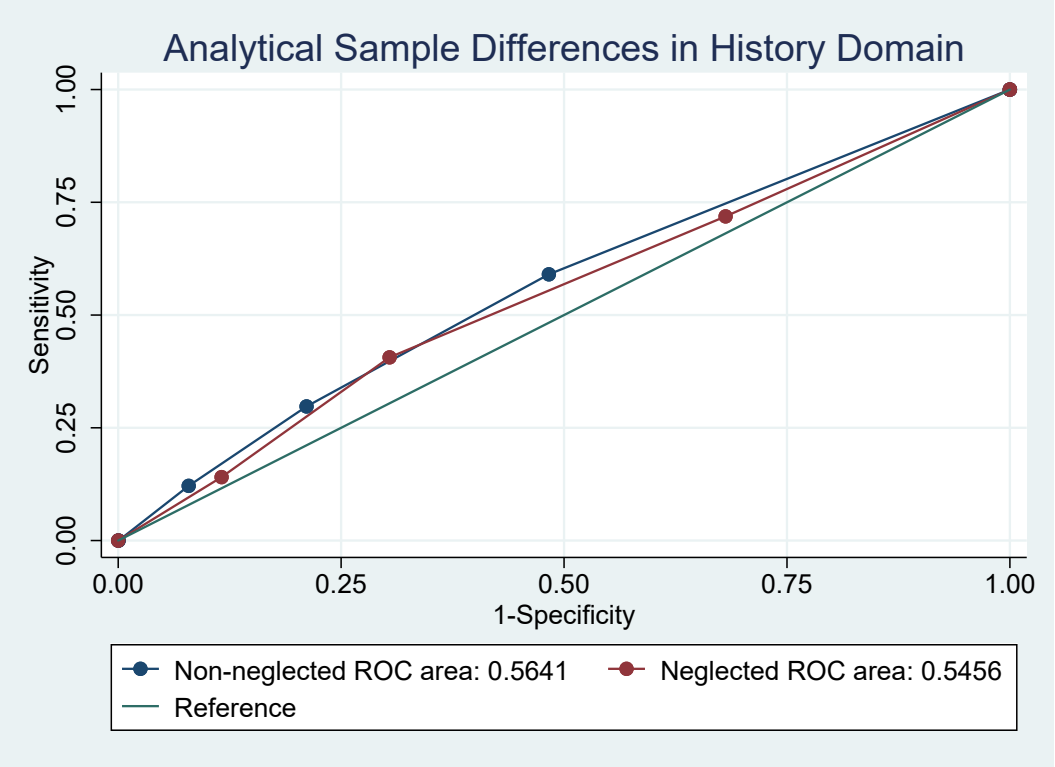

Figure 4. AUC Results of OYAS-DIS Family Domain Across Subgroups

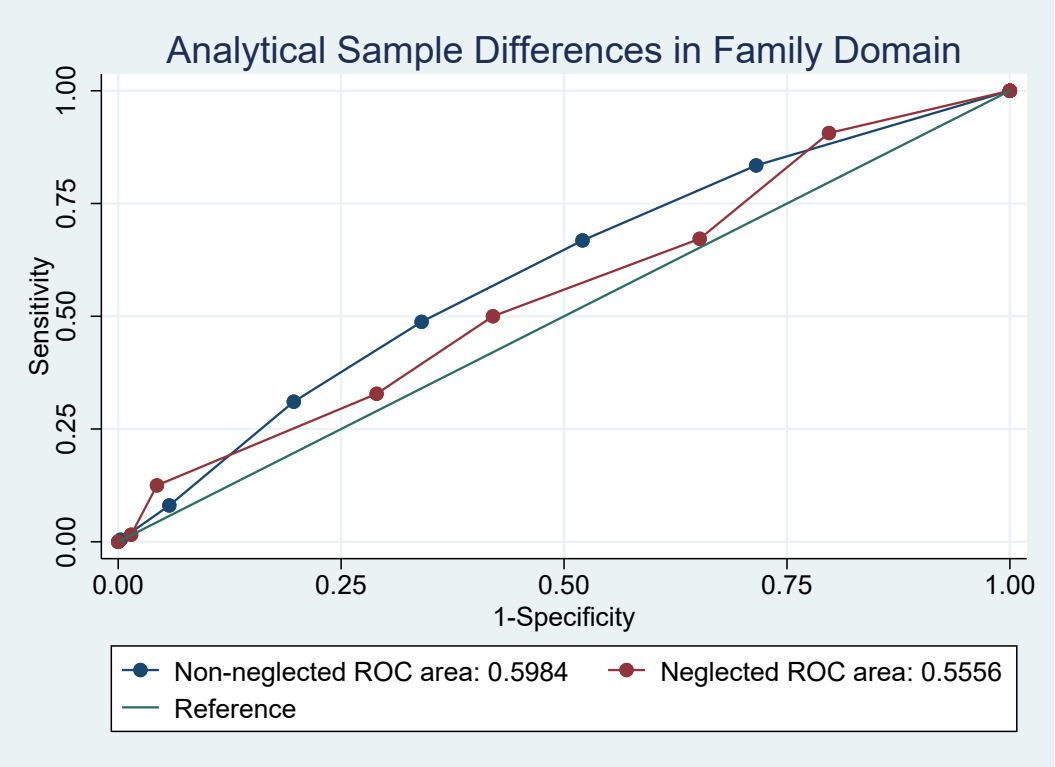

Figure 5. AUC Results of OYAS-DIS Peers Domain Across Subgroups

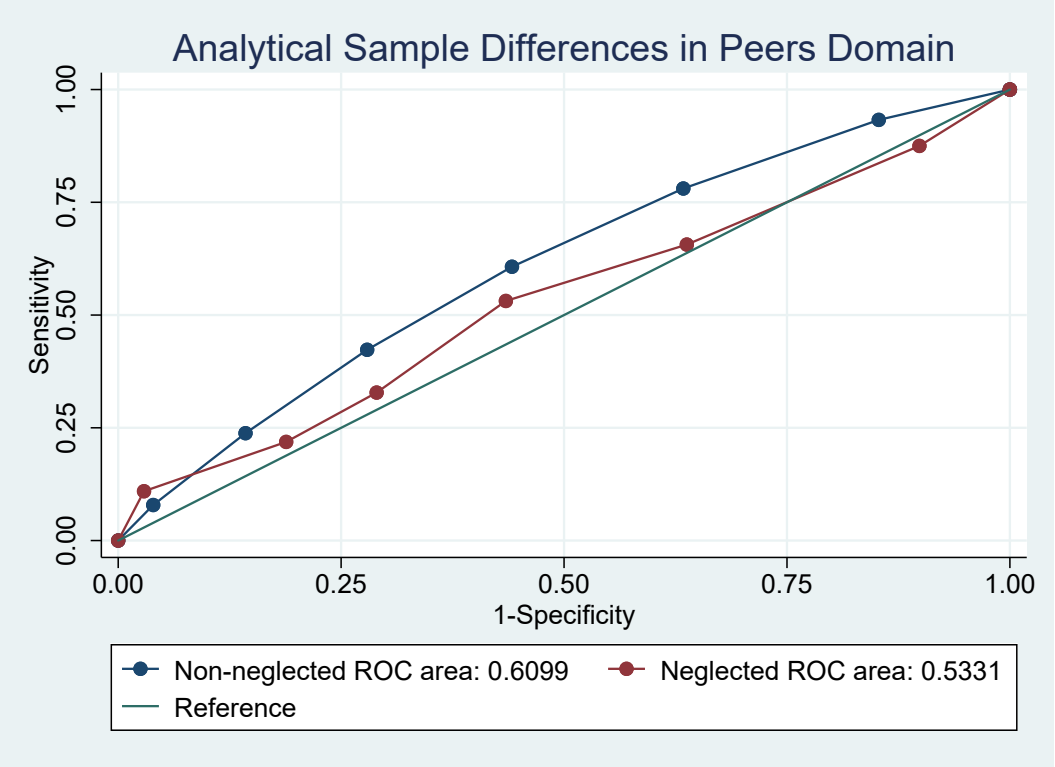

Figure 6. AUC Results of OYAS-DIS Education Domain Across Subgroups

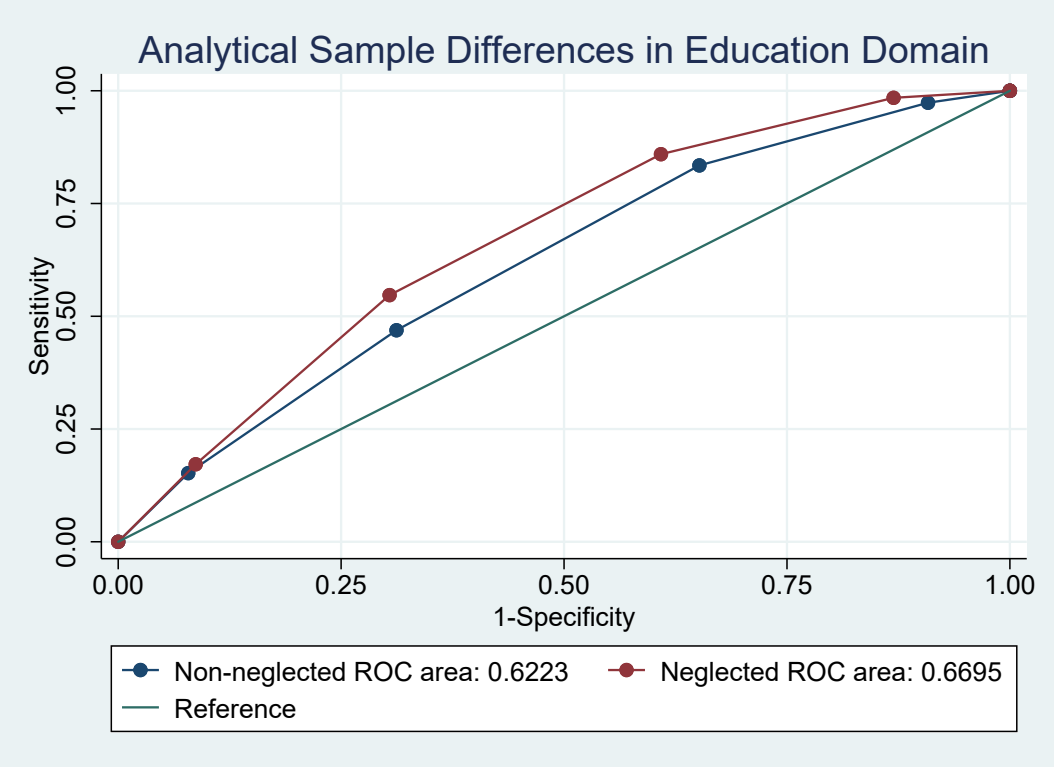

Figure 7. AUC Results of OYAS-DIS Prosocial Domain Across Subgroups

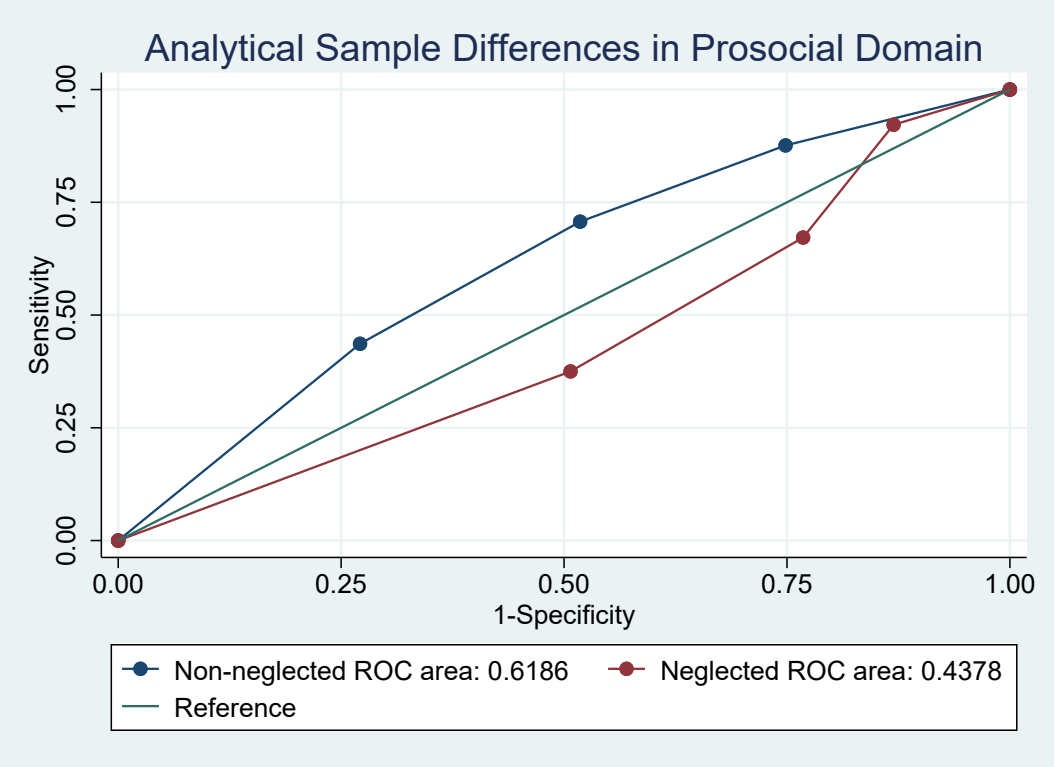

Figure 8. AUC Results of OYAS-DIS Substance Domain Across Subgroups

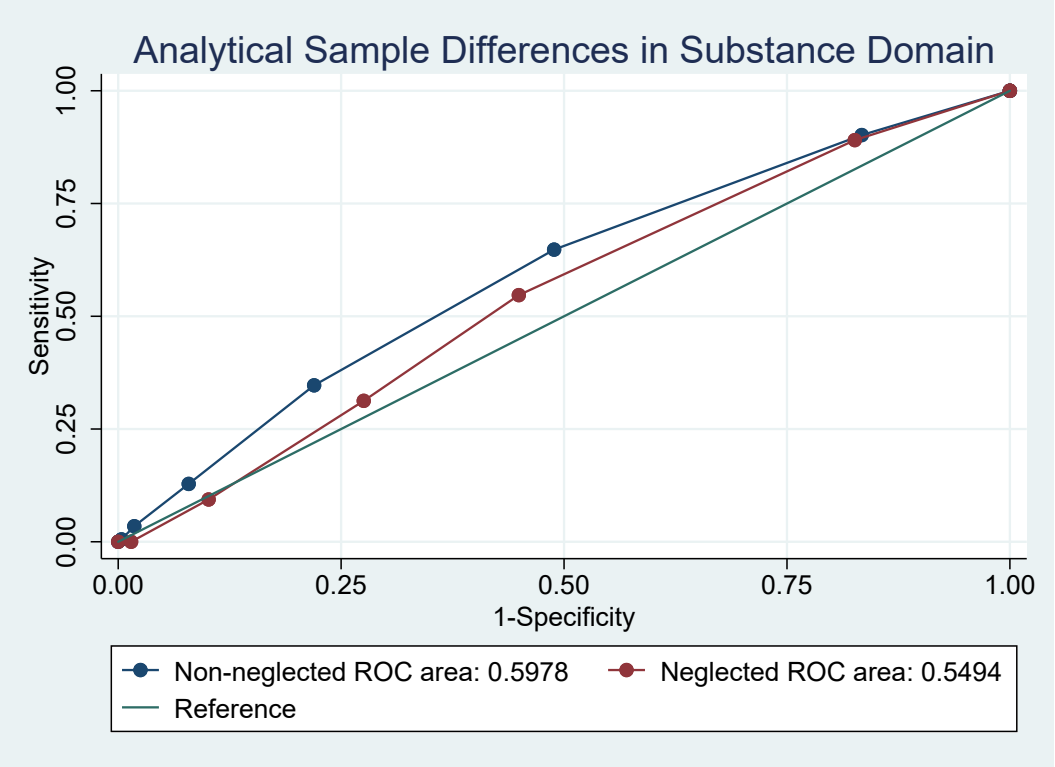

Figure 9. AUC Results of OYAS-DIS Values Domain Across Subgroups

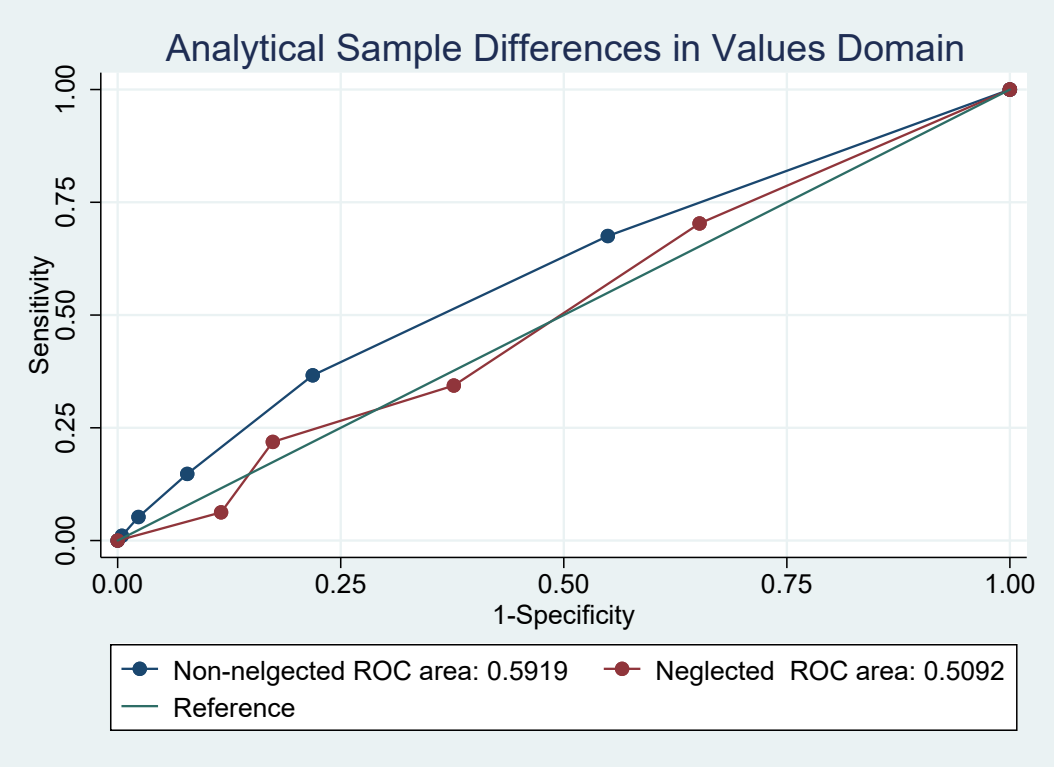

Table 8. AUC Results of OYAS-DIS Components Across Gender for Non-neglected Youth

	Youth without child welfare history					
	Boys			Girls		
	AUC	95% CI		AUC	95% CI	
Total Score	.67*	.65	.69	.63*	.59	.68
History	.58*	.55	.60	.51	.46	.56
Family	.60*	.57	.62	.61*	.57	.66
Peers	.62*	.59	.64	.57*	.53	.62
Education	.62*	.60	.64	.64*	.59	.68
Prosocial	.62*	.60	.64	.59*	.55	.64
Substance	.61*	.58	.63	.56*	.51	.60
Values	.60*	.57	.62	.58*	.53	.62

Note: *p < .05

Figure 10. AUC Results of OYAS-DIS Total Score Across Gender for Non-neglected Youth

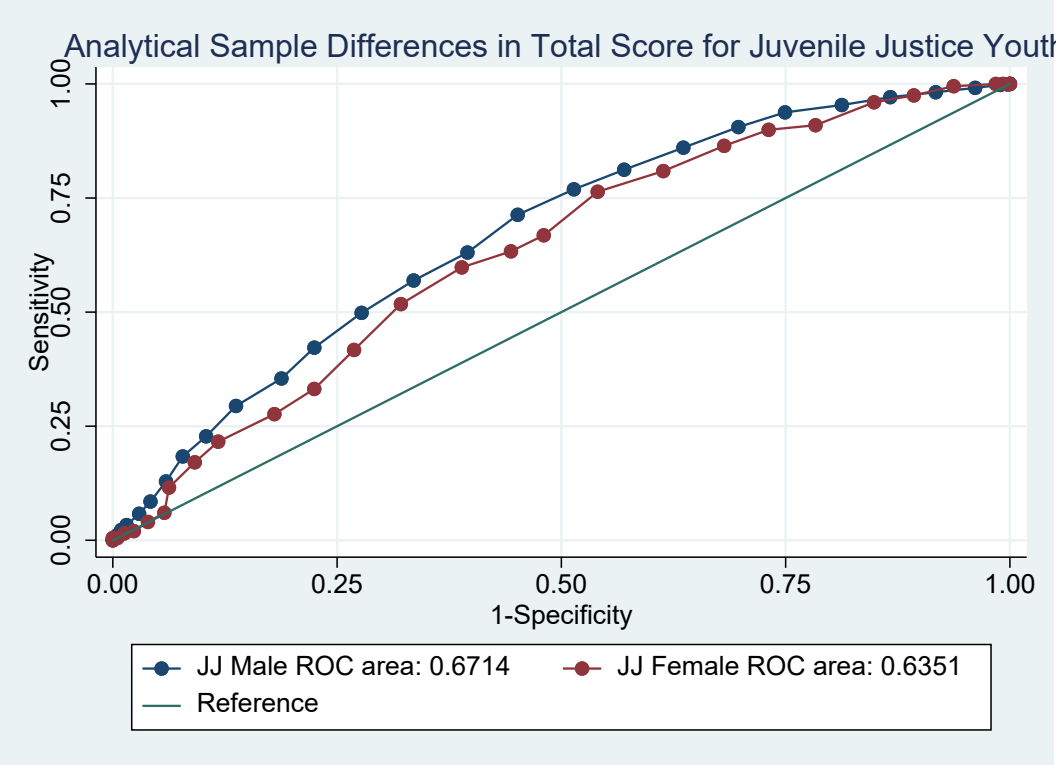

Figure 11. AUC Results of OYAS-DIS History Domain Across Gender for Non-neglected Youth

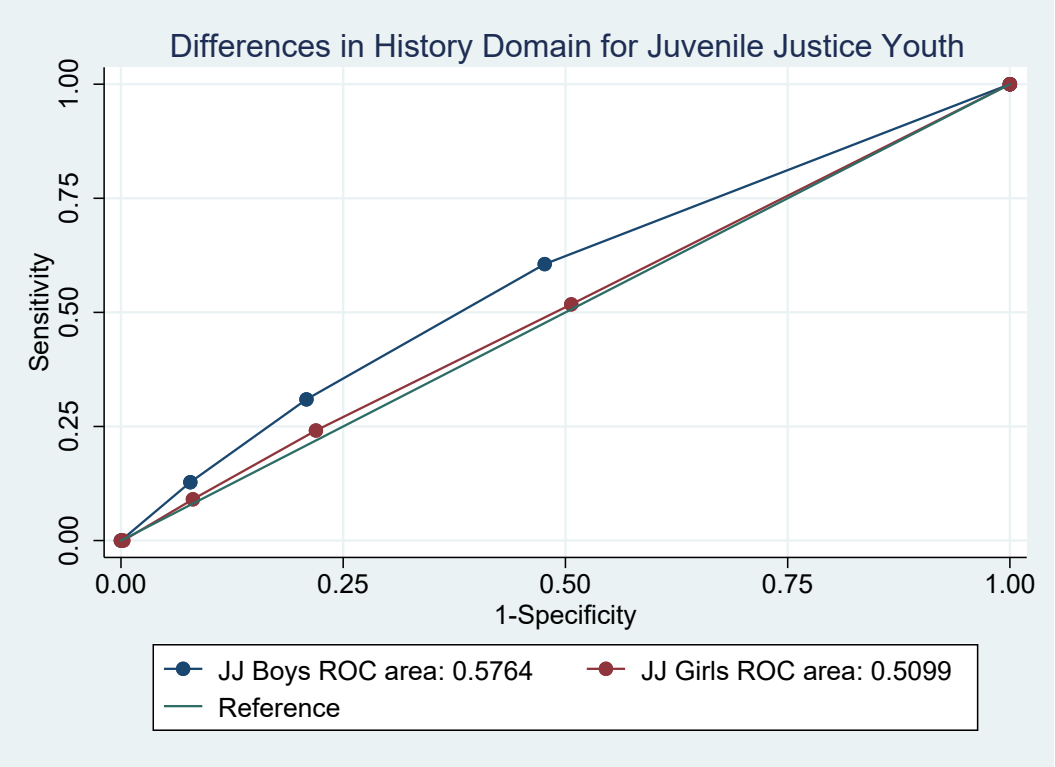

Figure 12. AUC Results of OYAS-DIS Family Domain Across Gender for Non-neglected Youth

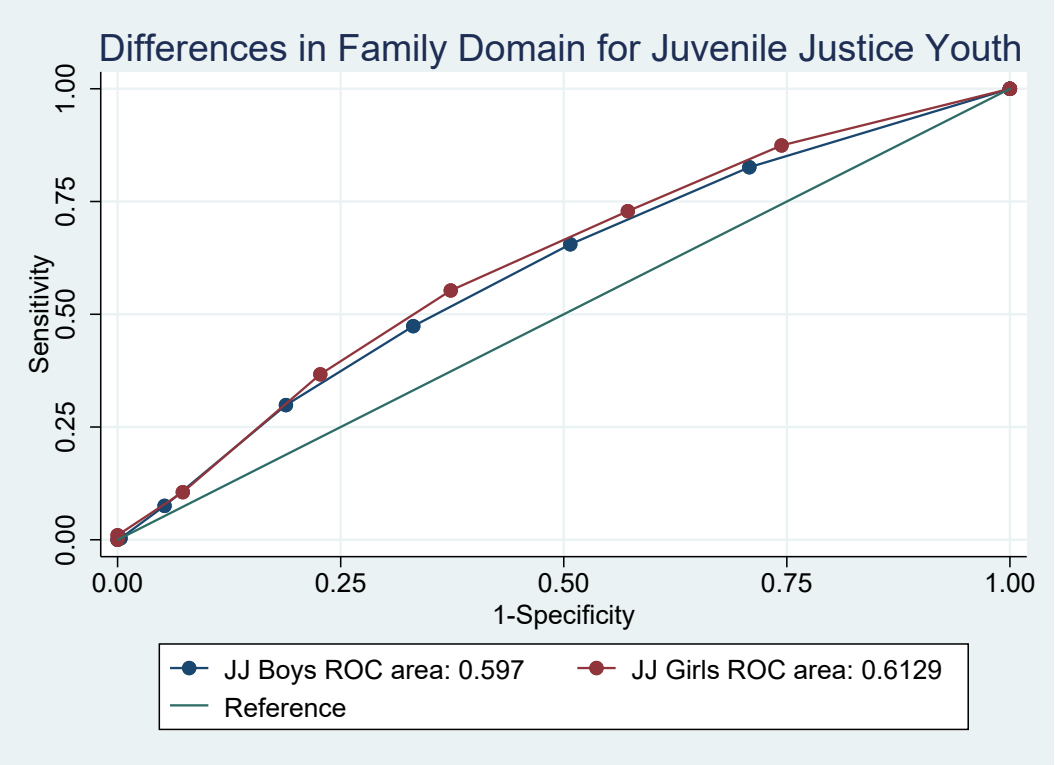

Figure 13. AUC Results of OYAS-DIS Peers Domain Across Gender for Non-neglected Youth

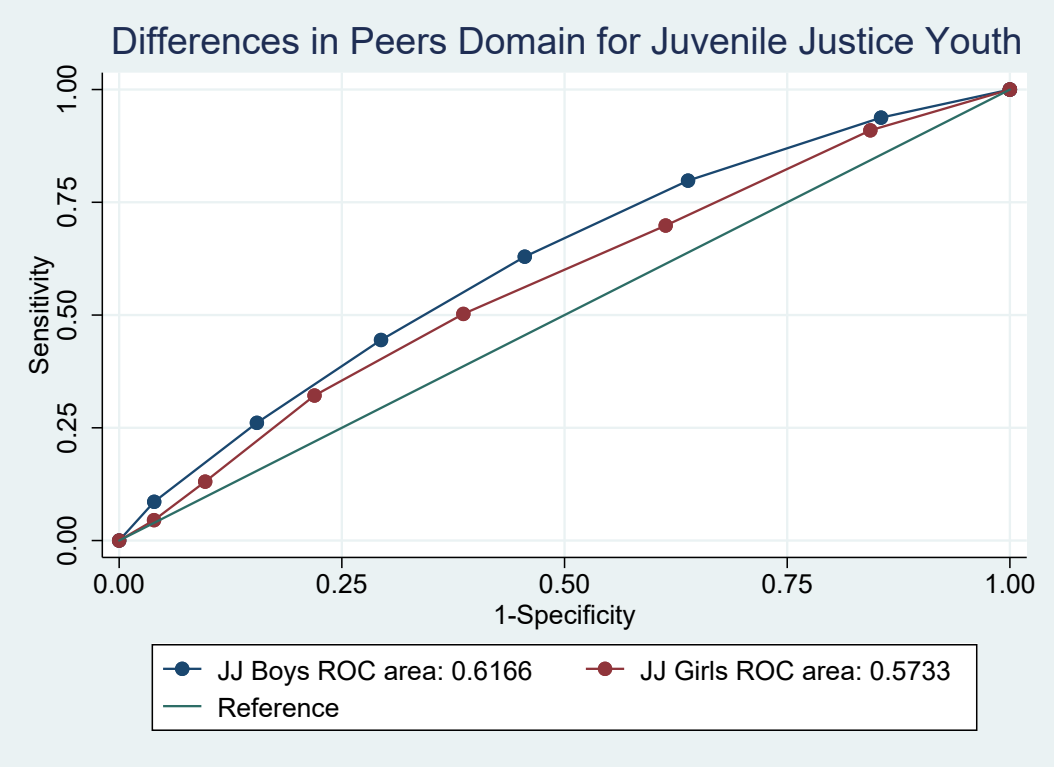

Figure 14. AUC Results of OYAS-DIS Education Domain Across Gender for Non-neglected Youth

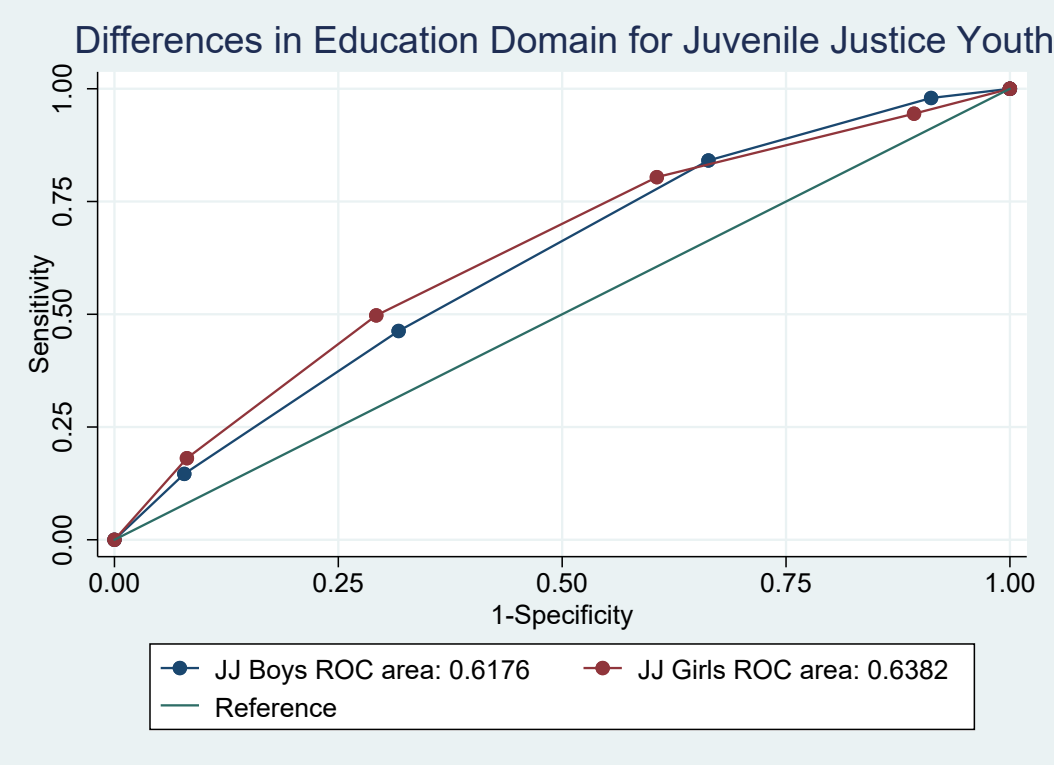

Figure 15. AUC Results of OYAS-DIS Prosocial Domain Across Gender for Non-neglected Youth

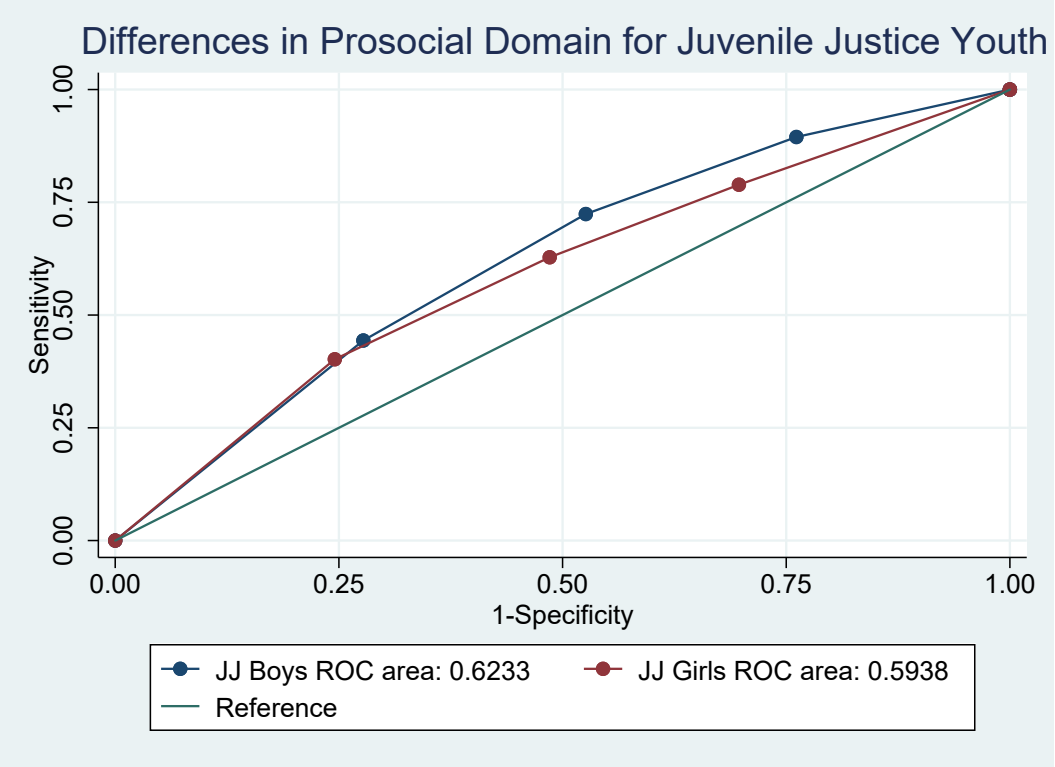

Figure 16. AUC Results of OYAS-DIS Substance Domain Across Gender for Non-neglected Youth

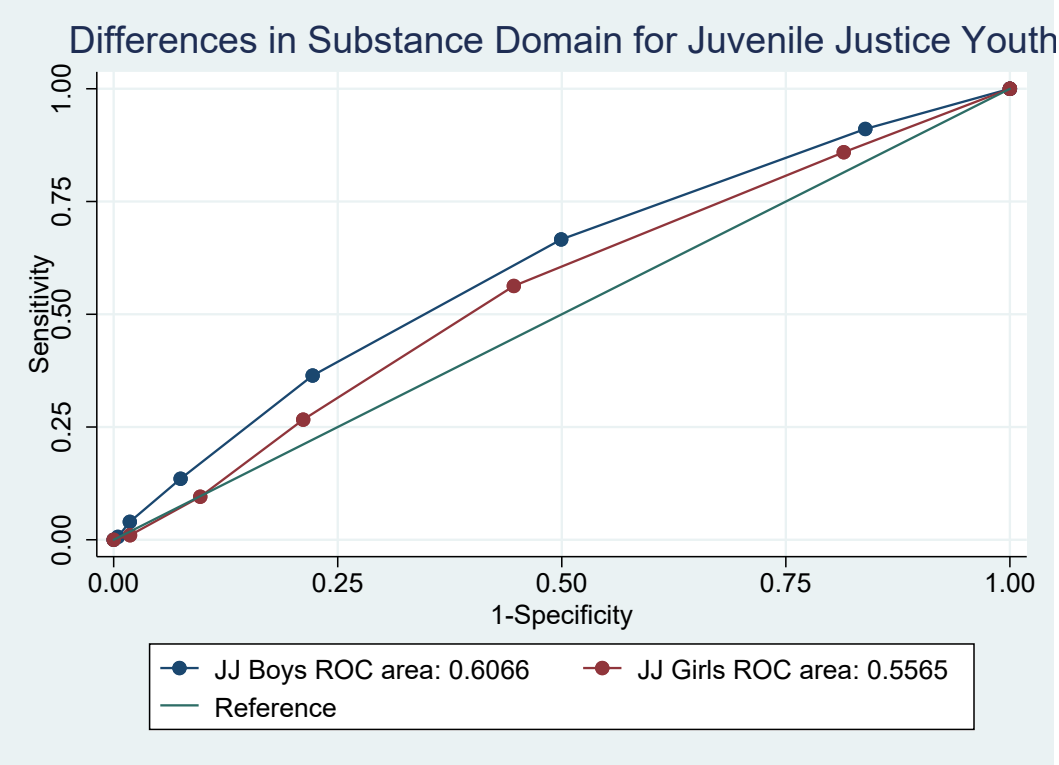

Figure 17. AUC Results of OYAS-DIS Values Domain Across Gender for Non-neglected Youth

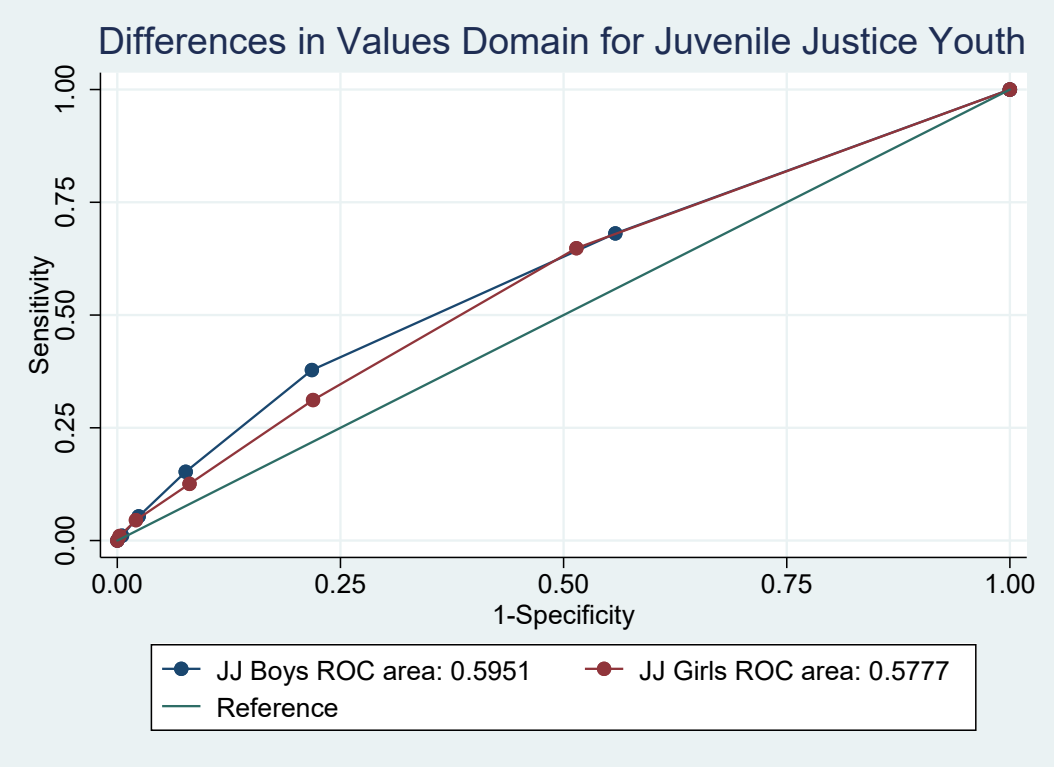

Table 9. AUC Results of OYAS-DIS Components Across Gender for Neglected Youth

	Youth with child welfare history					
	Boys			Girls		
	AUC	95% CI		AUC	95% CI	
Total Score	.59	.47	.70	.51	.32	.70
History	.58	.47	.69	.46	.27	.64
Family	.54	.43	.65	.63	.44	.81
Peers	.58	.47	.69	.39	.20	.58
Education	.65*	.55	.76	.70*	.53	.86
Prosocial	.46	.35	.57	.36	.18	.54
Substance	.56	.45	.67	.51	.33	.70
Values	.50	.39	.62	.51	.33	.69

Note: *p < .05

Figure 18. AUC Results of OYAS-DIS Total Score Across Gender for Neglected Youth

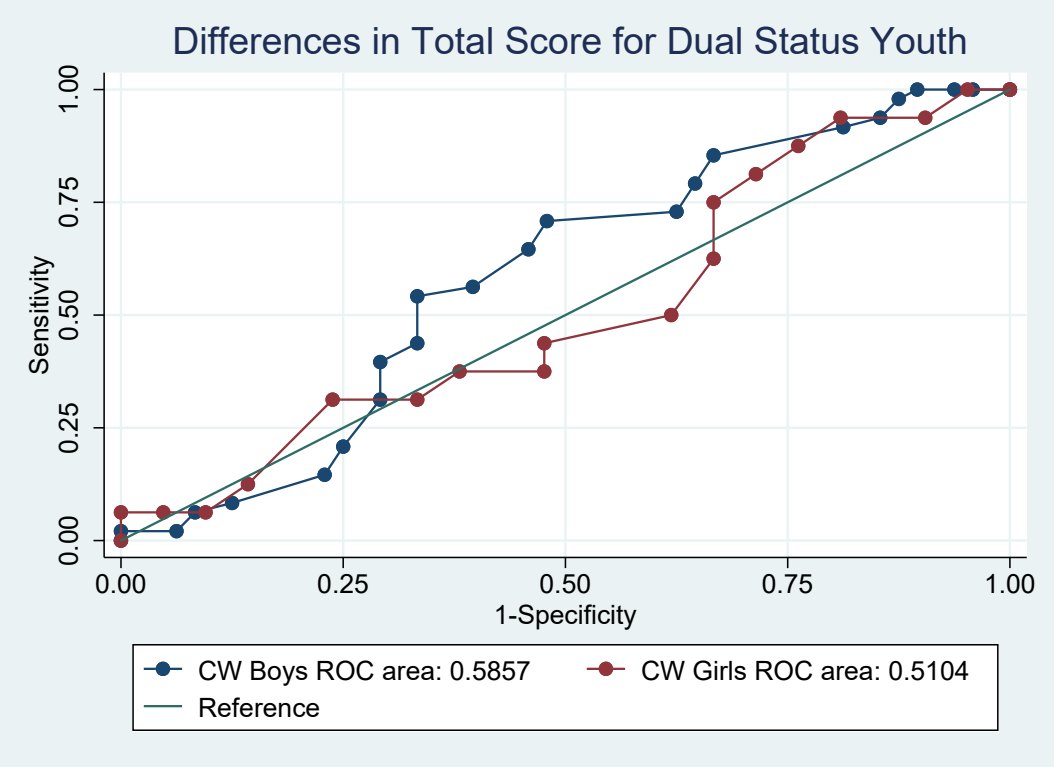

Figure 19. AUC Results of OYAS-DIS History Domain Across Gender for Neglected Youth

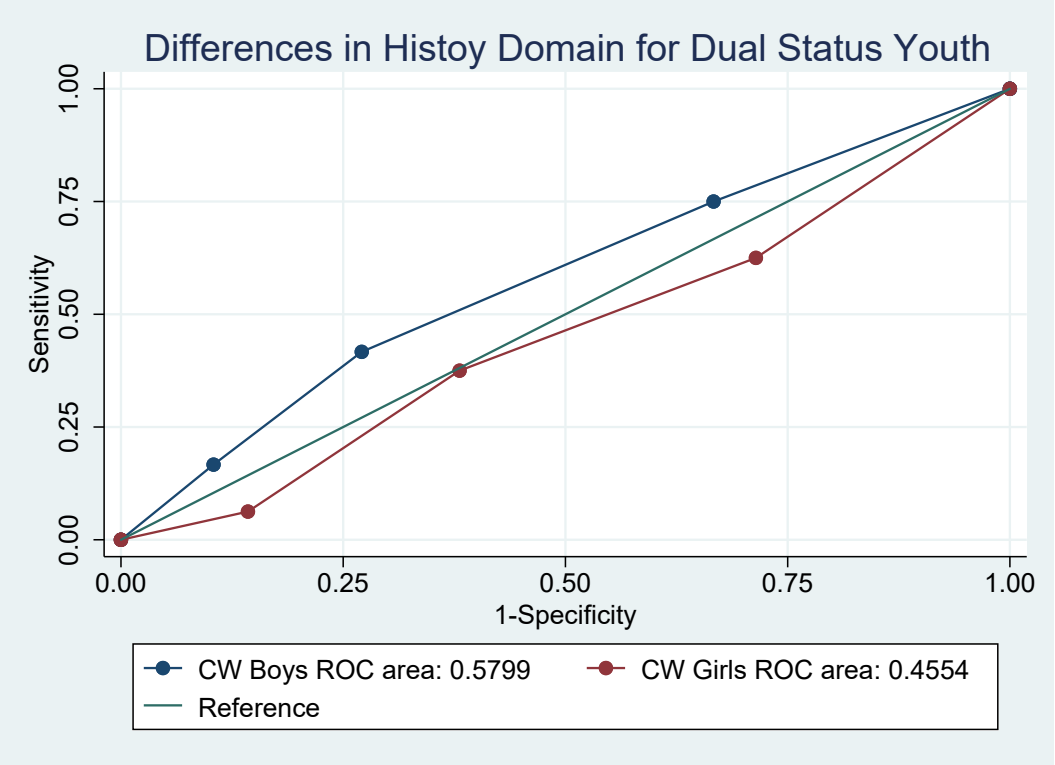

Figure 20. AUC Results of OYAS-DIS Family Domain Across Gender for Neglected Youth

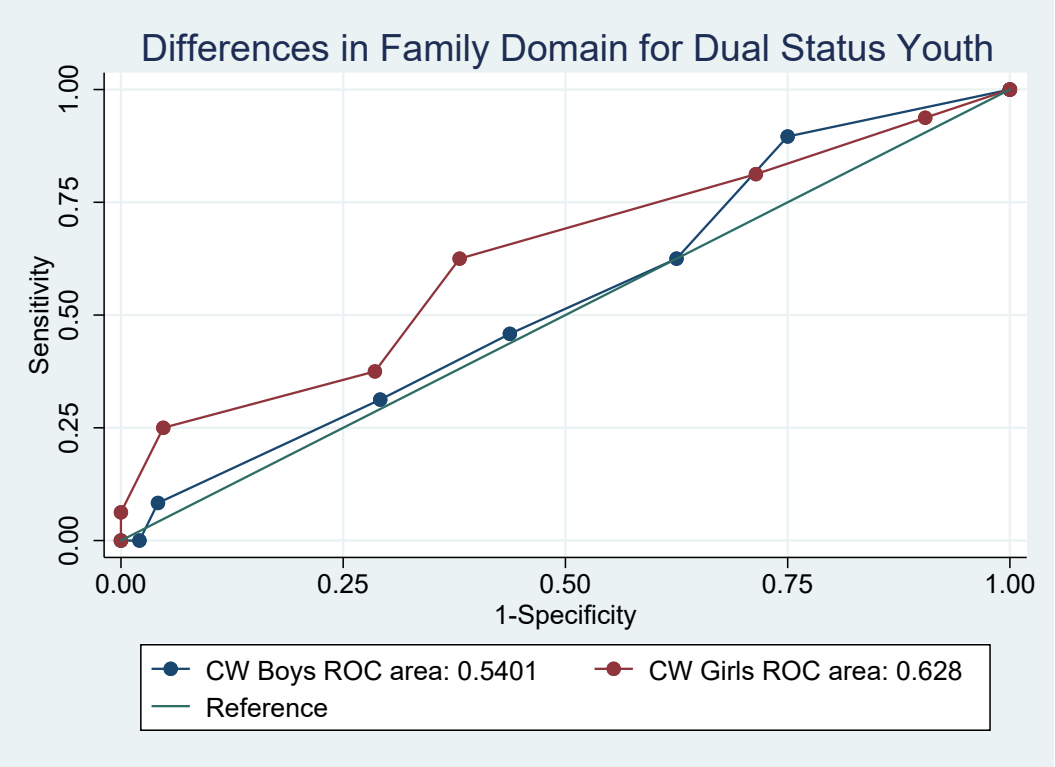

Figure 21. AUC Results of OYAS-DIS Peers Domain Across Gender for Neglected Youth

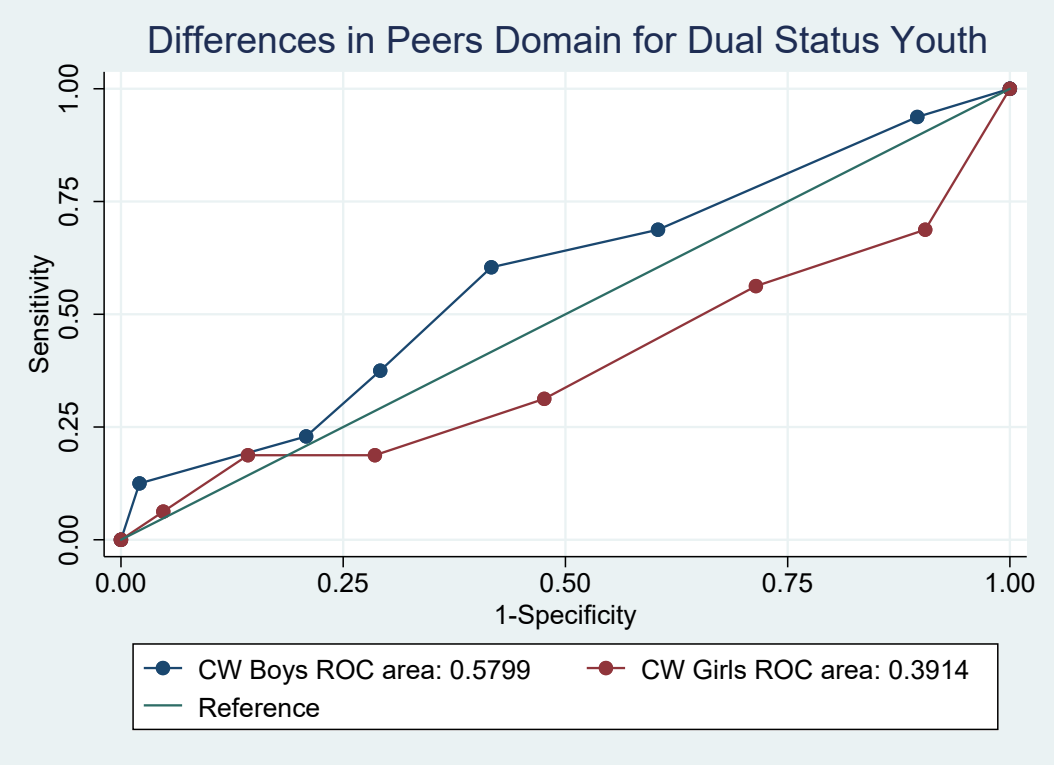

Figure 22. AUC Results of OYAS-DIS Education Domain Across Gender for Neglected Youth

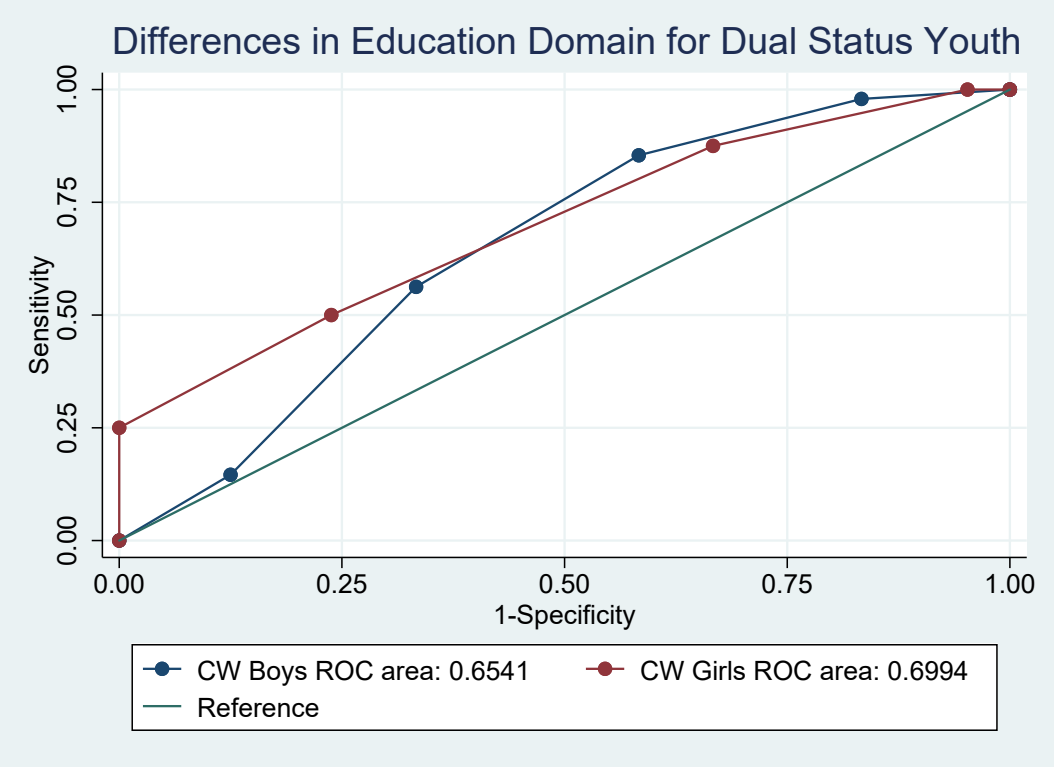

Figure 23. AUC Results of OYAS-DIS Prosocial Domain Across Gender for Neglected Youth

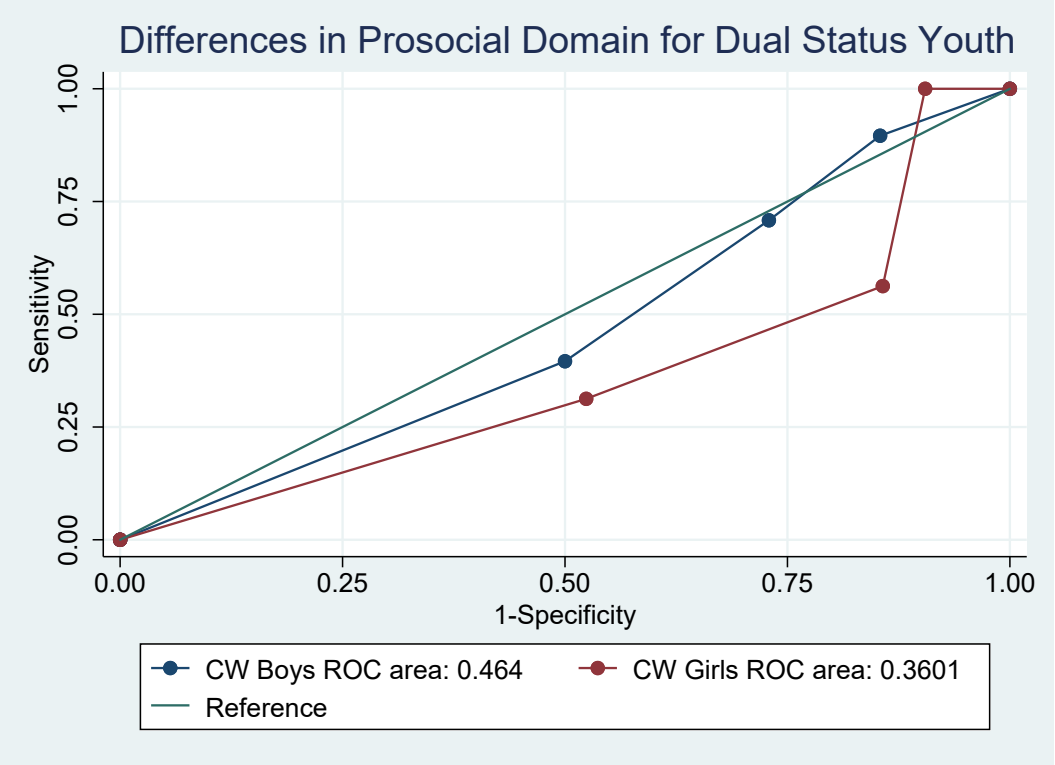

Figure 24. AUC Results of OYAS-DIS Substance Domain Across Gender for Neglected Youth

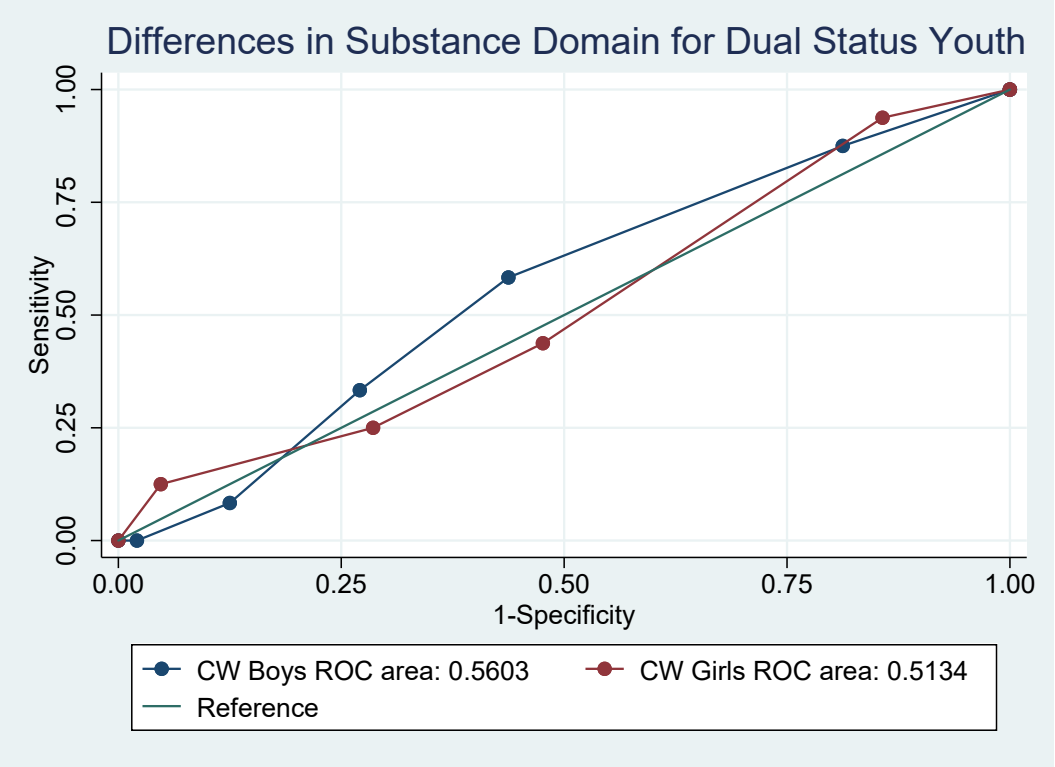

Figure 25. AUC Results of OYAS-DIS Values Domain Across Gender for Neglected Youth

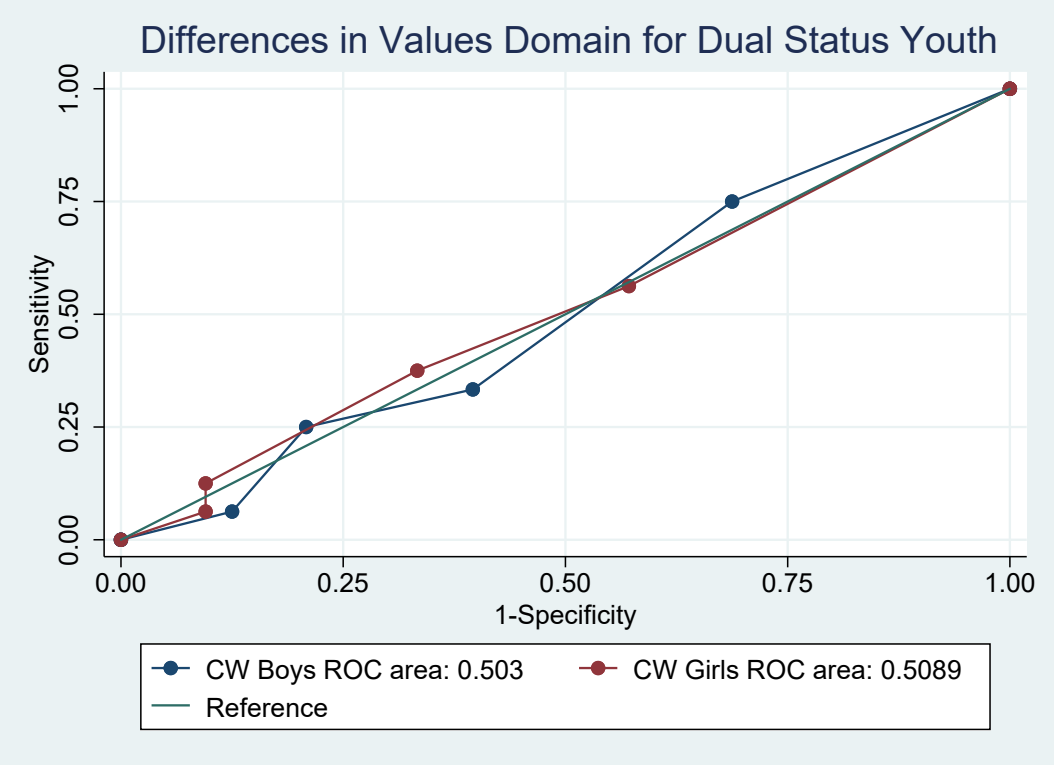

Table 10. Correlation Matrix of Variables in Analyses

	Age	**Race**	**Sex**	**Crime type**	**Risk level**	**Neglected**	**Disposition**
Age	1.00	--	--	--	--	--	--
Race	.06	1.00	--	--	--	--	--
Sex	-.03	-.01	1.00	--	--	--	--
Crime type	-.08	-.01	.00	1.00	--	--	--
Risk level	-.01	-.19	-.06	-.05	1.00	--	--
Neglected	-.06	-.00	.04	-.00	.03	1.00	--
Disposition	.04	-.06	-.11	.03	.11	-.06	1.00

Table 11. Multinomial Regression Results of Child Welfare Status Effect on Treatment Outcome

	Odds ratio	S.E.	z	p	95% CI	
Programs Only						
Age	1.05	.03	1.66	.09	-.01	.11
White	1.08	.98	.79	.43	-.11	.27
Female	.71*	.11	-3.06	.00	-.56	-.12
Violent	1.54*	.09	4.68	.00	.25	.61
Risk level	1.28*	.07	3.76	.00	.12	.38
Neglected	.83	.21	-.88	.38	-.61	.23
_cons	.24	.51	-2.78	.00	-2.39	-.41
Probation Only						
Age	.99	.04	-.18	.86	-.08	.06
White	.84	.12	-1.44	.15	-.41	.06
Female	.73*	.14	-2.34	.02	-.59	-.05
Violent	1.05	.11	.44	.66	-.17	.27
Risk level	1.14	.08	1.66	.10	-.02	.28
Neglected	1.05	.24	.20	.84	-.43	.53
_cons	.54	.61	-1.24	.22	-1.95	.44
Both						
Age	1.12*	.03	3.24	.00	.04	.18
White	.79*	.11	-2.14	.03	-.46	-.02
Female	.48*	.14	-5.38	.00	-1.00	-.46
Violent	1.30*	.10	2.55	.01	.06	.46
Risk level	1.53*	.07	5.90	.00	.28	.56
Neglected	.27*	.35	-3.72	.00	-1.99	-.62
_cons	.06	.57	-4.76	.00	-3.84	-1.60

Note: *p < .05

Table 12. Logistic Regression Results of Treatment on Recidivism for Non-neglected Youth

Non-neglected	Odds Ratio	S.E.	z	p	95% CI	
Age	.78*	.02	-9.06	.00	.74	.82
Nonwhite	.59*	.05	-5.81	.00	.50	.71
Female	.82	.09	-1.90	.06	.67	1.01
Violent	.69*	.06	4.56	.00	.59	.81
Risk level	2.07*	.12	12.51	.00	1.84	2.31
Probation	1.79*	.21	5.05	.00	1.43	2.24
Programs	1.72*	.20	4.72	.00	1.37	2.15
Both	1.99*	.27	5.12	.00	1.53	2.59
_cons	7.80	3.58	4.51	.00	3.19	19.07

Note: *p < .05

Table 13. Logistic Regression Results of Treatment on Recidivism for Neglected Youth

Neglected	Odds Ratio	S.E.	z	p	95% CI	
Age	.79	.10	-1.89	.06	.62	1.01
Nonwhite	.66	.29	-.96	.34	.28	1.54
Female	.71	.30	-.80	.42	.31	1.64
Violent	.49	.19	1.84	.07	.23	1.05
Risk level	1.05	.28	.20	.84	.63	1.76
Probation	.77	.56	-.35	.73	.19	3.22
Programs	.53	.40	-.85	.39	.12	2.29
Both	.61	.47	-.64	.52	.13	2.80
_cons	71.03	142.63	2.12	.03	1.39	3637.37

Note: *p < .05

Figure 26. Nelson-Aalen Cumulative Hazard Estimate for Survival Model

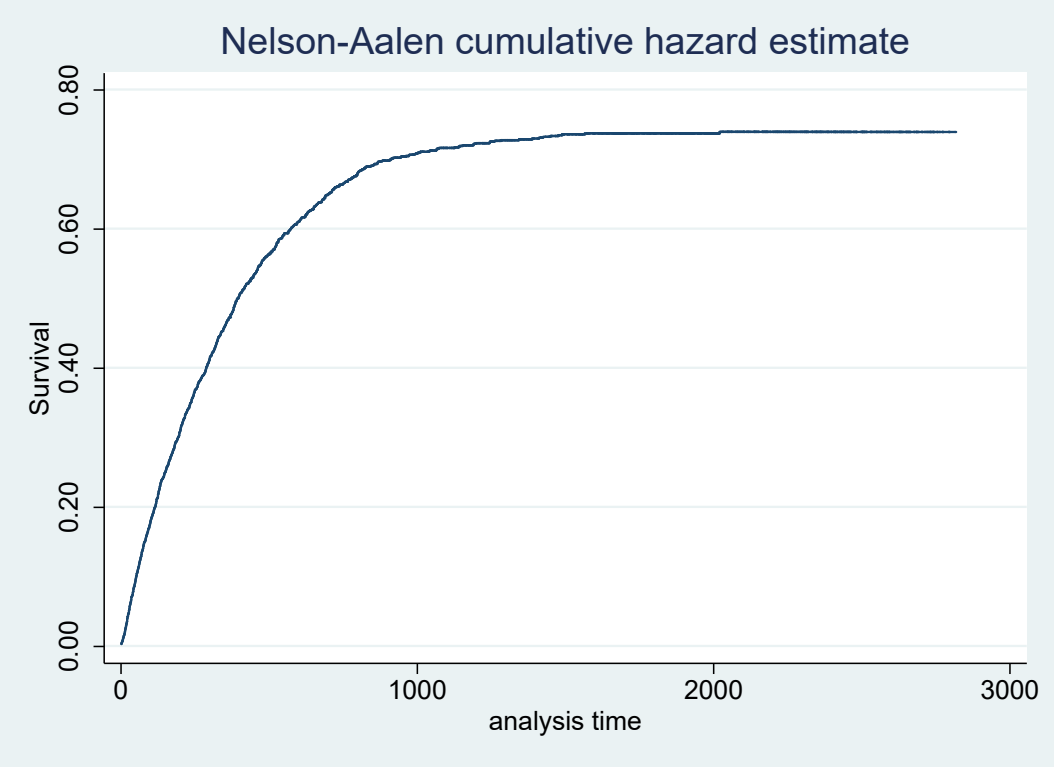

Figure 27. Survival Curve by Sex

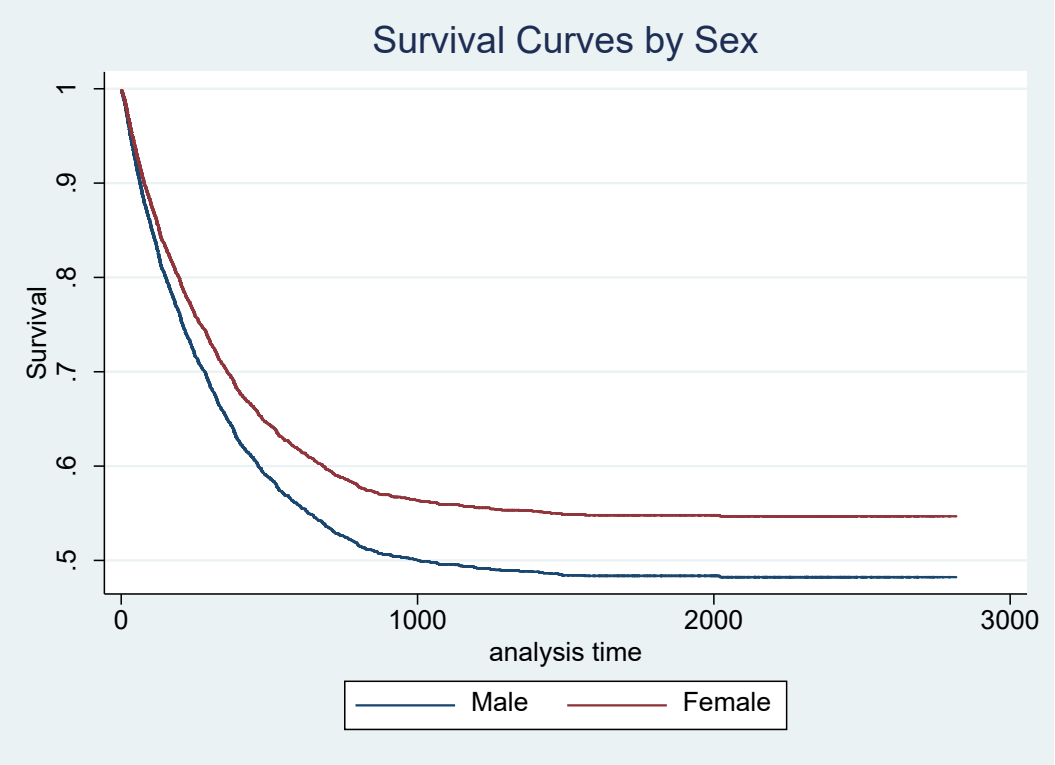

Figure 28. Survival Curve by Race

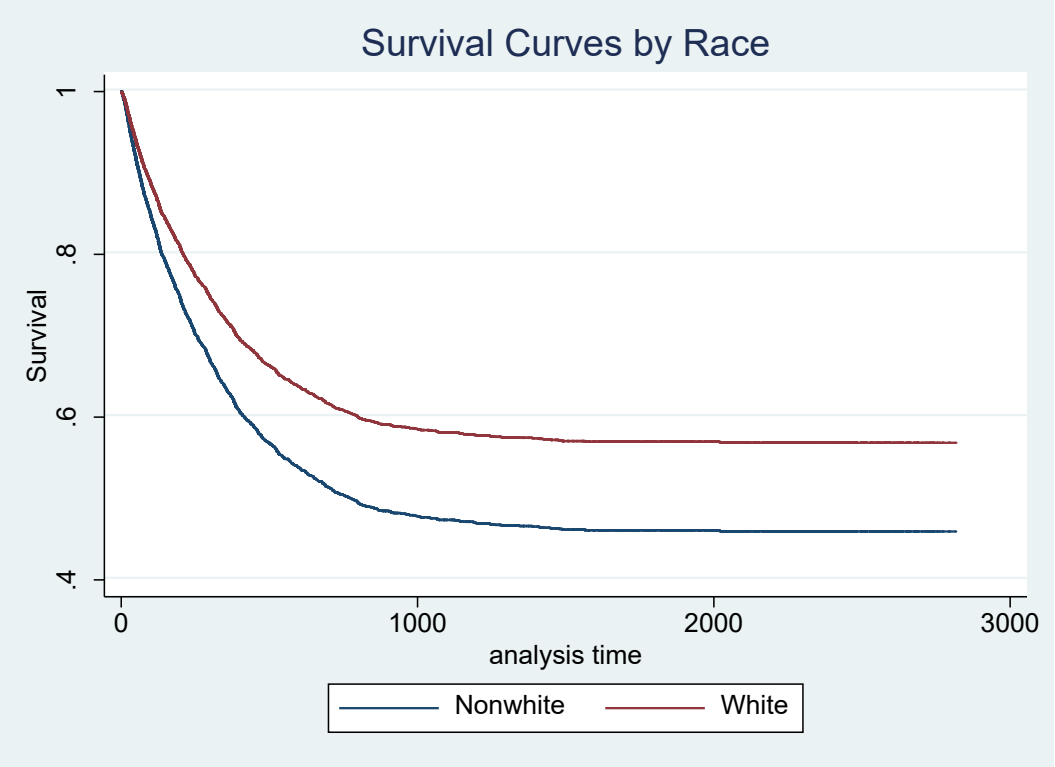

Figure 29. Survival Curve by Risk Level

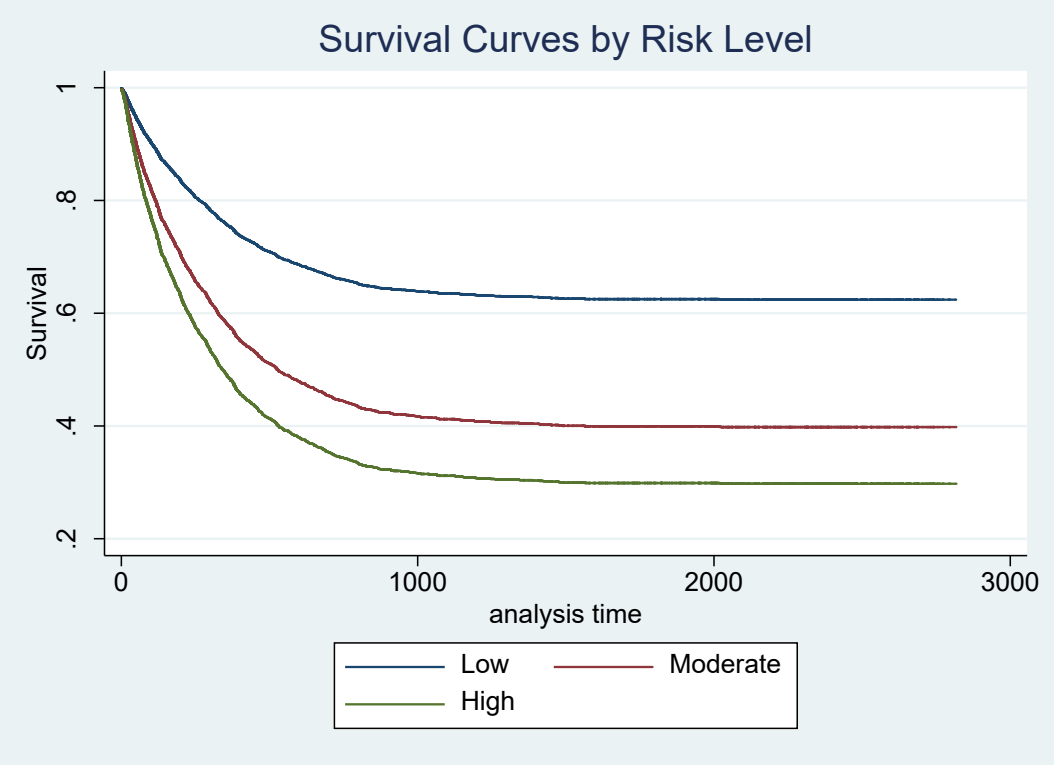

Figure 30. Survival Curve by Age

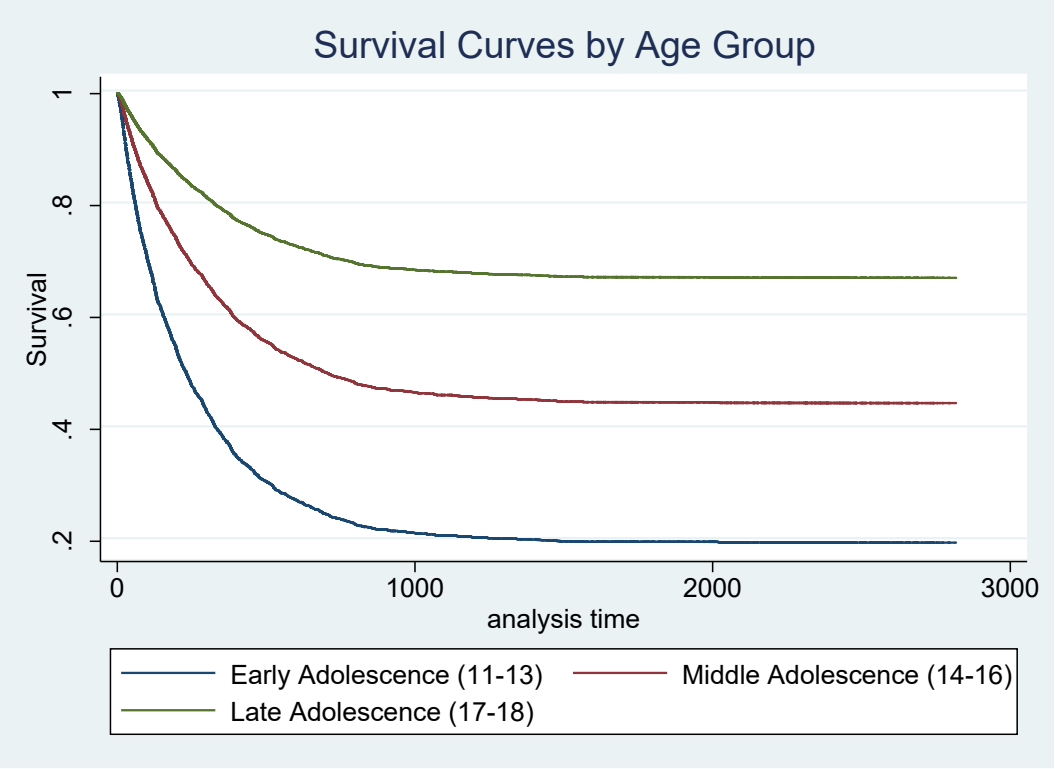

Figure 31. Survival Curve by Crime Type

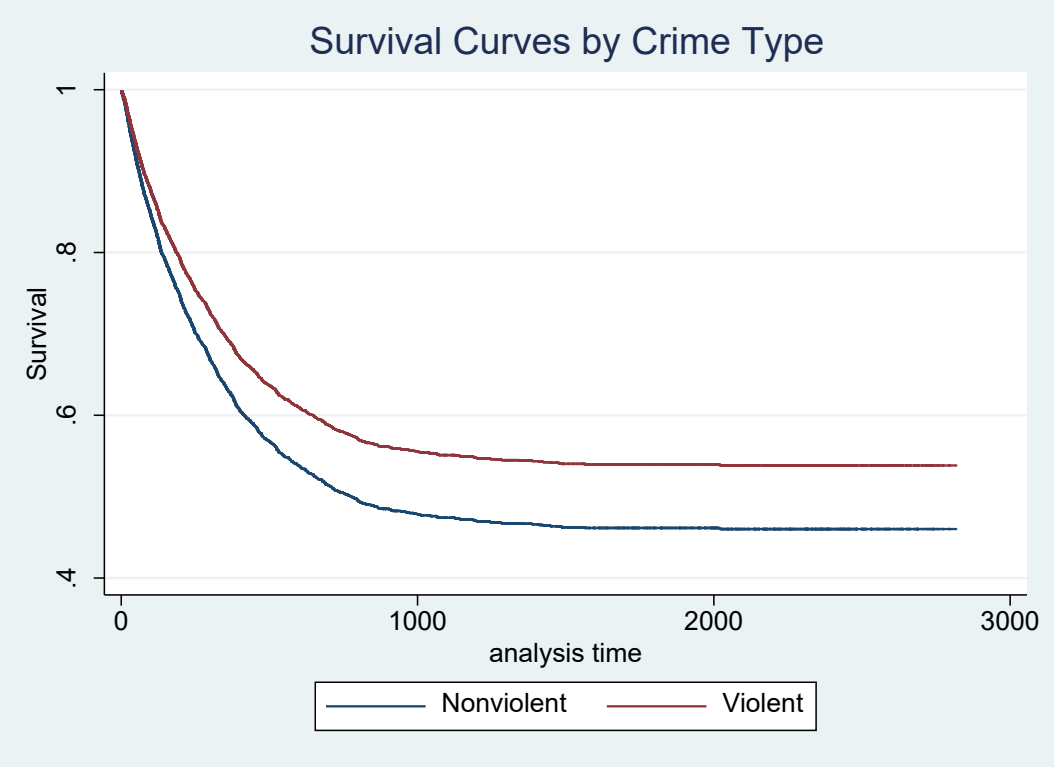

Figure 32. Survival Curve by Disposition Received

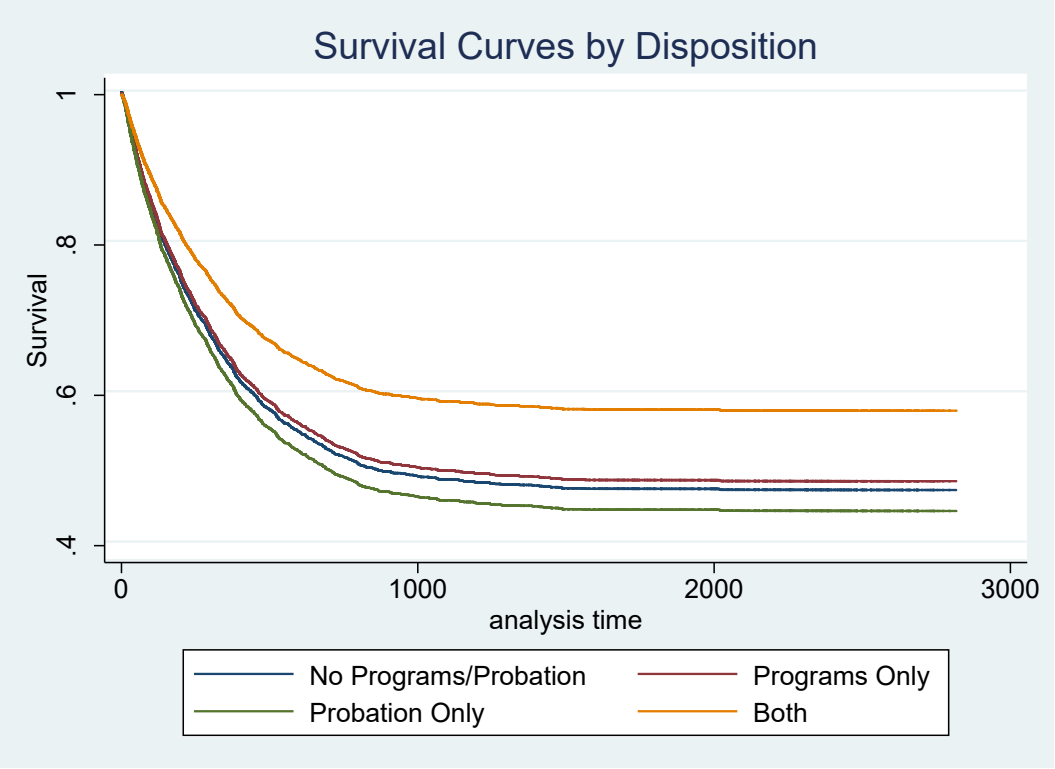

Figure 33. Survival Curve by Neglect Status

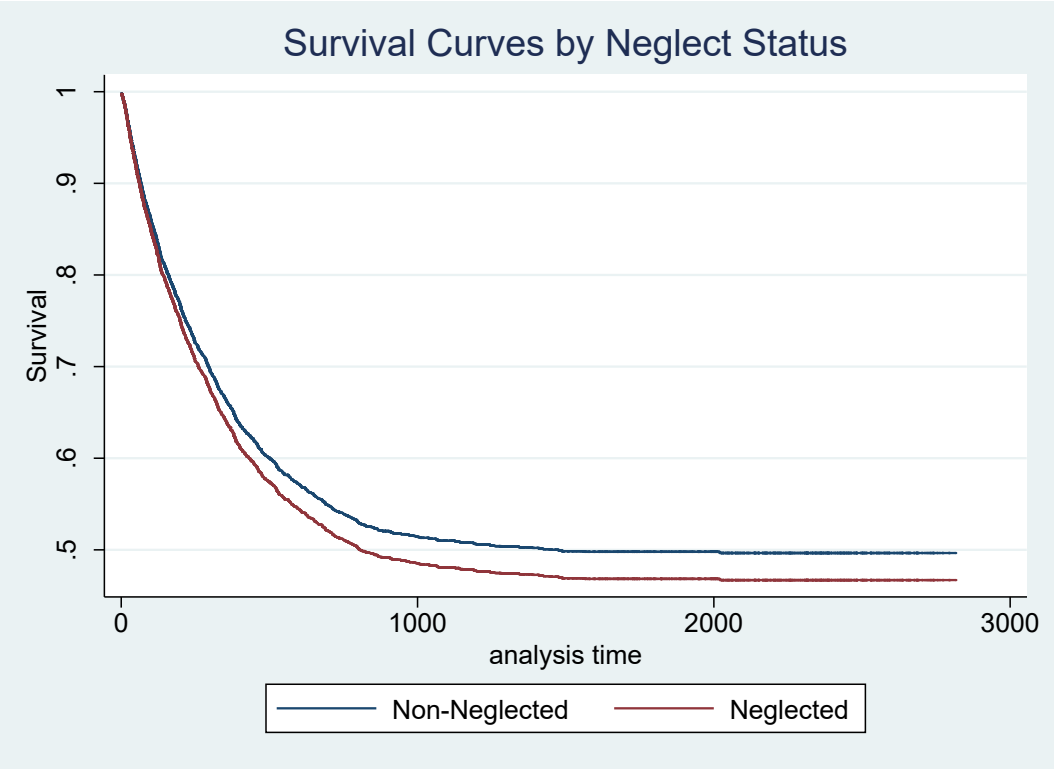

Table 14. Survival Analysis Final Model Results

Variable	Odds Ratio	S.E.	z	p	95% CI	
Female	.83*	.07	-2.88	.00	-.32	-.06
Nonwhite	.73*	.06	-5.48	.00	-.44	-.21
Risk level						
Moderate	1.95*	.06	11.43	.00	.55	.78
High	2.56*	.07	13.07	.00	.80	1.09
Age	.76*	.02	-17.74	.00	-.31	-.24
Crime type	.79*	.05	-4.35	.00	-.33	-.12
Disposition						
Programs	.96	.06	-.58	.57	-.16	.09
Probation	1.07	.08	.93	.35	-.08	.22
Both	.72*	.07	-4.45	.00	-.47	-.18
Neglected	1.08	.11	.73	.46	-.14	.31

Note: *p < .05

Table 15. Logistic Regression Results for Propensity Score Analysis

Variable	Odds Ratio	S.E.	z	p	95% CI	
History	1.30*	.09	3.00	.00	.09	.44
Family	1.07	.06	1.00	.32	-.06	.19
Education	.92	.09	-.84	.40	-.26	.11
Peers	.90	.06	-1.81	.07	-.23	.01
Prosocial	1.30*	.10	2.70	.00	.07	.45
Substance	.87	.08	-1.72	.09	-.31	.02
Values	1.22*	.09	2.33	.03	.03	.37
Age	.84*	.06	-2.98	.00	-.29	-.06
Race	1.03	.20	.14	.89	-.37	.43
Sex	1.55*	.20	2.18	.03	.05	.84
Crime type	.91	.18	-.49	.62	-.45	.27
_cons	.39	.94	-.99	.32	-2.79	.91

Note: *p < .05

Figure 34. Overlap Assumption Test for Propensity Score Analysis

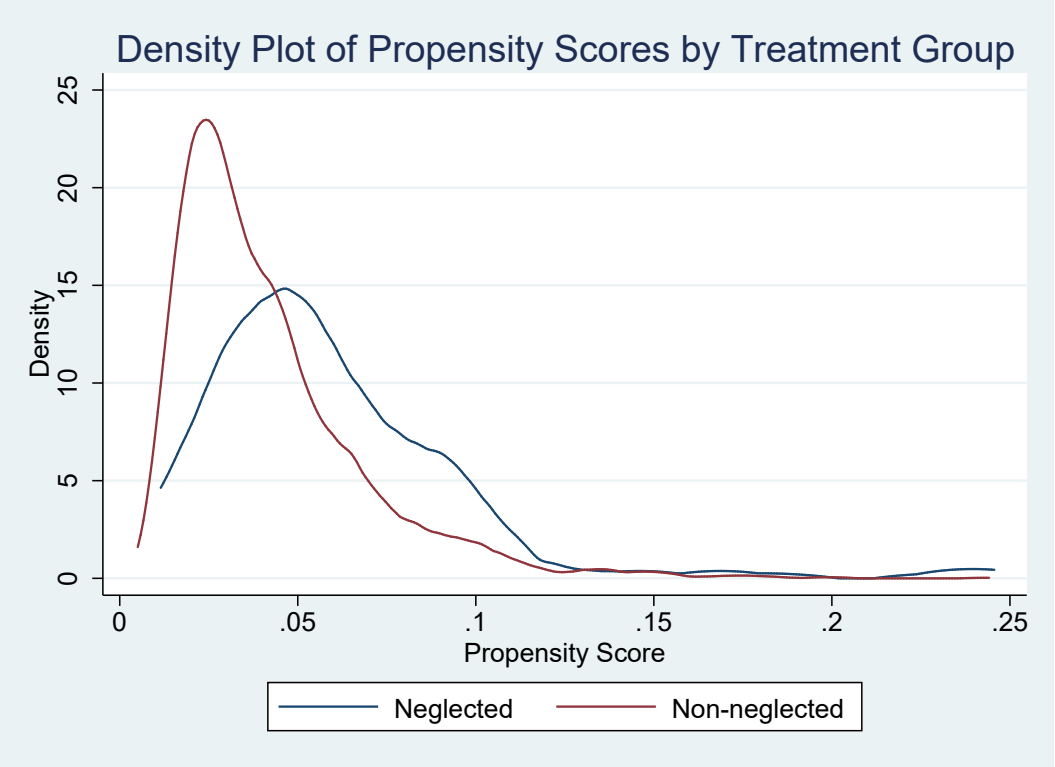

Table 16. Reduction of Bias Results for Propensity Score Analysis for Unmatched Sample

Variable	Mean Treated	Mean Control	% Bias	% Reduction	t	p
Age	15.08	15.56	-31.7	--	-3.72*	.00
Nonwhite	.32	.33	-2.1	--	-.24	.81
Female	.28	.19	20.0	--	2.41*	.02
Crime type	.44	.44	-0.9	--	-.10	.92
History	1.18	.86	31.8	--	3.61*	.00
Family	2.38	2.04	20.8	--	2.34*	.02
Education	2.20	2.13	6.5	--	.75	.46
Peers	2.59	2.64	-2.6	--	-.30	.77
Prosocial	2.06	1.72	31.6	--	3.41*	.00
Substance	1.75	1.80	-4.1	--	-.46	.65
Values	1.32	1.02	25.8	--	3.13*	.00

Note: *p < .05

Table 17. Reduction of Bias Results for Propensity Score Analysis for Matched Sample

Variable	Mean Treated	Mean Control	% Bias	% Reduction	t	p
Age	15.08	15.22	-9.8	69.0	-.78	.44
Nonwhite	.32	.29	6.4	-204.5	.53	.59
Female	.28	.28	0.0	100.0	.00	1.00
Crime type	.44	.38	12.1	-1214.3	1.00	.32
History	1.18	1.30	-12.0	62.2	-.90	.37
Family	2.38	2.56	-11.7	43.9	-.95	.34
Education	2.20	2.17	2.7	57.8	.23	.82
Peers	2.59	2.81	-12.3	-373.9	-1.03	.30
Prosocial	2.06	2.06	0.0	100.0	-.00	1.00
Substance	1.75	1.90	-12.2	-196.1	-.95	.34
Values	1.32	1.43	-8.8	65.7	-.66	.51

Table 18. Propensity Score Analysis Results on Outcome

Outcome	Sample	Neglected	Non-neglected	Difference	S.E.	t	p
New petition	Unmatched	.48	.38	.11	.04	2.46*	.00
	ATT	.48	.42	.06	.06	.98	.93

Note: *p < .05