Examining Risk Factors of Juvenile Delinquency and the Predictive Validity of a Juvenile Risk Assessment Instrument Across Urban and Rural Communities

Kelly Vannan
University of Central Florida

Part of the Criminology and Criminal Justice Commons

Find similar works at: https://stars.library.ucf.edu/etd2020

University of Central Florida Libraries http://library.ucf.edu

This Doctoral Dissertation (Open Access) is brought to you for free and open access by STARS. It has been accepted for inclusion in Electronic Theses and Dissertations, 2020- by an authorized administrator of STARS. For more information, please contact STARS@ucf.edu.

STARS Citation
https://stars.library.ucf.edu/etd2020/575
EXAMINING RISK FACTORS OF JUVENILE DELINQUENCY
AND THE PREDICTIVE VALIDITY OF A JUVENILE RISK ASSESSMENT INSTRUMENT ACROSS URBAN AND RURAL COMMUNITIES

by

KELLY M. VANNAN
M.S. University of North Florida, 2013
B.S. State University of New York, 2008

A dissertation submitted in partial fulfillment of the requirements for the Degree of Doctor of Philosophy in the Doctoral Program in Public Affairs in the College of Community Innovation and Education at the University of Central Florida Orlando, Florida

Spring Term
2021

Major Professor: Kristina Childs
ABSTRACT

Juvenile delinquency among the nation’s youth is an ongoing concern. An essential task of juvenile justice workers is to identify and measure risk factors that impact a youth’s likelihood of recidivating. The Florida Department of Juvenile Justice (FDJJ) utilizes the Positive Achievement Change Tool (PACT) to assess the risk for recidivism among all juveniles referred to the system. The current study examined how youths’ level and types of risk, as well as the ability of the PACT to predict the odds of reoffending and the time to reoffend, vary across urban and rural communities. This study drew upon theories of social disorganization and collective efficacy (Raudenbush & Sampson, 1999; Shaw & McKay, 1942) and Andrews and Bonta’s (2010) Risk-Need-Responsivity (RNR) model. Secondary data was used from 10,229 juvenile probationers in Florida to conduct bivariate analyses including chi-square tests of significance, independent samples t-tests, area under the curve estimations, multivariate logistic regression, and survival analyses. Results indicated that a greater proportion of urban youths than rural youths were rated at higher risk levels for recidivism. Of the eight types of risks examined, only past antisocial behavior, current antisocial peers, and current substance abuse varied significantly across community type. Also, a significant relationship was found between recidivism and community type. Finally, the PACT predicted both the odds of recidivism and time to recidivism more accurately for urban youths than for rural youths. The findings of this study may help guide juvenile justice practitioners in more accurately identifying risk factors and in determining whether one risk assessment instrument is sufficient for assessing juveniles from different types of communities.
ACKNOWLEDGMENTS

There were many times over the past several years when I was sure this dissertation would never be finished. The fact that it is finally done is a testament to the enduring support and guidance of my chairperson Dr. Kristina Childs Fisher. She has been an example of perseverance and professionalism. I would not have reached this lifelong goal of mine without her help. I am so grateful!

I once had a science professor who told me, “You can’t say you understand physics until you can explain it to your 90-year old grandma.” I have since learned that almost every 90-year old I’ve met is much wiser than I, but more to the point, Dr. Childs and Drs. Jennifer Peck, Matt Nobles, and Kimberley Gryglewicz made sure my writing was precise enough that anyone could understand what I was explaining. They offered invaluable feedback and encouragement.

My dear friend Katherine Gomez stood by my side through these years as we trudged through the trenches together. She gave me an ear to bend, a brain to pick, many amazing home-cooked meals, and priceless memories! She, along with the many brilliant, wonderful people I met while in this program, left an impression on me and inspired me to “just keep swimming.”

Finally, thank you with all my heart to my husband and children. My youngest kids have no memories of me other than me as a student, lugging my textbooks and laptops on vacations, writing when everyone else was going to the movies, serving fast food for dinner whenever I had a deadline coming up…they tolerated it all with love, patience, and grace. They are my “why” and I am excited to finally relax and join in the fun!
# TABLE OF CONTENTS

LIST OF FIGURES .................................................................................................................. vi
LIST OF TABLES ......................................................................................................................... vii
LIST OF ACRONYMS AND ABBREVIATIONS ........................................................................ viii

CHAPTER 1: INTRODUCTION .................................................................................................. 1
   Statement of the Problem ...................................................................................................... 2
   Research Questions ............................................................................................................. 3
   Study Methods and Findings .............................................................................................. 4

CHAPTER 2: LITERATURE REVIEW ......................................................................................... 6
   Community Type: Urban and Rural .................................................................................... 6
      Past Macro-Level Studies on Community Type and Crime .......................................... 8
      Past Micro-Level Studies on Community Type and Crime ........................................... 12
      Summary ....................................................................................................................... 14
   Risk Factors and Needs among Juvenile Offenders ............................................................ 15
      Individual Risk Factors for Delinquency ..................................................................... 16
      Variations in Risk Factors for Delinquency across Urban and Rural Areas ................ 25
      Summary ....................................................................................................................... 29
   Juvenile Risk and Needs Assessment ................................................................................. 30
      Juvenile Justice Risk Assessment Instruments .............................................................. 30
      Evolution of Juvenile Risk Assessments .................................................................... 30
      Summary ....................................................................................................................... 38
   Chapter Summary ............................................................................................................. 39

CHAPTER 3: THEORETICAL FRAMEWORK ............................................................................. 41
   Social Disorganization Theory ............................................................................................ 41
      Collective Efficacy ........................................................................................................ 42
      Individual Risk Factors for Delinquency .................................................................... 44
      Summary ....................................................................................................................... 55
   Social Disorganization and the Predictive Validity of the PACT ...................................... 56
      Summary ....................................................................................................................... 59
   Chapter Summary ............................................................................................................. 60

CHAPTER 4: METHODS .......................................................................................................... 61
LIST OF FIGURES

Figure 1: Days to Recidivate Across Community Type ................................................................. 91
LIST OF TABLES

Table 1: PACT Domains .............................................................................................................. 69
Table 2: PACT Scoring Matrix .................................................................................................. 72
Table 3: Sample Demographics ................................................................................................. 83
Table 4: Descriptive Statistics for PACT Risk Domain Scores ................................................. 84
Table 5: Level of Risk of Recidivism Across Community Type ................................................ 84
Table 6: Types of Risk of Recidivism Across Community Type ................................................ 85
Table 7: Recidivism Across Community Type ............................................................................ 87
Table 8: Odds of Youths Recidivating Across Community Type ................................................ 88
Table 9: Cox Regression using Risk to Reoffend as the Predictor Variable ............................. 92
## LIST OF ACRONYMS AND ABBREVIATIONS

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-CRA</td>
<td>Adolescent Community Reinforcement Approach</td>
</tr>
<tr>
<td>ACS</td>
<td>American Community Survey</td>
</tr>
<tr>
<td>APP</td>
<td>Antisocial Personality Pattern</td>
</tr>
<tr>
<td>CAIS</td>
<td>Correctional Assessment and Intervention System</td>
</tr>
<tr>
<td>COMPAS</td>
<td>Correctional Offender Management Profiling for Alternative Sanctions</td>
</tr>
<tr>
<td>CV</td>
<td>Control Variable</td>
</tr>
<tr>
<td>DV</td>
<td>Dependent Variable</td>
</tr>
<tr>
<td>ERS</td>
<td>Economic Research Service</td>
</tr>
<tr>
<td>FBI</td>
<td>Federal Bureau of Investigation</td>
</tr>
<tr>
<td>FDJJ</td>
<td>Florida Department of Juvenile Justice</td>
</tr>
<tr>
<td>FDLE</td>
<td>Florida Department of Law Enforcement</td>
</tr>
<tr>
<td>HHS</td>
<td>U.S. Department of Health and Human Services</td>
</tr>
<tr>
<td>IV</td>
<td>Independent Variable</td>
</tr>
<tr>
<td>J-SORRAT-II</td>
<td>Juvenile Sexual Offense Recidivism Risk Assessment Tool-II</td>
</tr>
<tr>
<td>LGBTQ</td>
<td>Lesbian, Gay, Bisexual, Transgender, Queer or Questioning</td>
</tr>
<tr>
<td>MDFT</td>
<td>Multidimensional Family Therapy</td>
</tr>
<tr>
<td>MTF</td>
<td>Monitoring the Future</td>
</tr>
<tr>
<td>NCAR</td>
<td>North Carolina Assessment of Risk</td>
</tr>
<tr>
<td>OJJDP</td>
<td>Office of Juvenile Justice and Delinquency Prevention</td>
</tr>
<tr>
<td>OMB</td>
<td>Office of Management and Budget</td>
</tr>
<tr>
<td>OYAS-DIS</td>
<td>Ohio Youth Assessment System Dispositional Tool</td>
</tr>
<tr>
<td>PACT</td>
<td>Positive Achievement Change Tool</td>
</tr>
<tr>
<td>Acronym</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>PCL-YV</td>
<td>Psychopathy Checklist–Youth Version</td>
</tr>
<tr>
<td>R-PACT</td>
<td>Residential Positive Achievement Change Tool</td>
</tr>
<tr>
<td>RNR</td>
<td>Risk-Need-Responsivity</td>
</tr>
<tr>
<td>SAMHSA</td>
<td>Substance Abuse and Mental Health Services</td>
</tr>
<tr>
<td>SAVRY</td>
<td>Structured Assessment of Violence Risk in Youth</td>
</tr>
<tr>
<td>SDT</td>
<td>Social Disorganization Theory</td>
</tr>
<tr>
<td>SES</td>
<td>Socioeconomic Status</td>
</tr>
<tr>
<td>UA</td>
<td>Urban Area</td>
</tr>
<tr>
<td>UC</td>
<td>Urban Cluster</td>
</tr>
<tr>
<td>UCR</td>
<td>Uniform Crime Reporting</td>
</tr>
<tr>
<td>USPS</td>
<td>U.S. Postal Service</td>
</tr>
<tr>
<td>WSJCA</td>
<td>Washington State Juvenile Court Assessment</td>
</tr>
<tr>
<td>YLS/CMI</td>
<td>Youth Level of Service/Case Management Invent</td>
</tr>
</tbody>
</table>
CHAPTER 1: INTRODUCTION

An understanding of the factors that drive delinquent behavior is the basis for several criminological theories and extensive research on juvenile delinquency. “Accurate prediction of future criminal behavior and recidivism is one of the, if not the, most important challenge in criminological research and practice” (Loeber & Ahonen, 2014, p. 122). Researchers have approached the problem of predicting risk factors for delinquency from many angles, attempting to ascertain who will offend, and how, where, when, and why they offend. Gaining a clear understanding of the risk factors for delinquent behavior will inform the development and implementation of effective strategies for eliminating or reducing the impact that certain risk factors have on youths’ lives (e.g., future delinquent behavior).

A substantial body of research has identified key risk factors for delinquency (Andrews & Bonta, 2010). These risk factors include characteristics of individual youths such as antisocial behavior, antisocial personality patterns, antisocial attitudes, antisocial peers, substance abuse, family problems, school performance, and use of leisure time. Prior research has also indicated that many of these individual-level risk factors for delinquency are impacted by the type of community in which youths live (Chamberlain & Hipp, 2015; Cook-Craig et al., 2010; Dudgeon & Evanson, 2014; Nelson et al., 2010; Perkins et al., 2002). Community characteristics influence the behaviors, attitudes, values, and opportunities of youths (Brooks-Gunn et al., 1993). Thus, knowledge of how urban and rural community characteristics affect risk factors for delinquency is critical.

Urban and rural communities differ in terms of ecological, social, and structural characteristics (Nelson et al., 2010; Wells & Weisheit, 2004). These characteristics include population size and density, geography, socioeconomic status (SES), racial/ethnic heterogeneity,
family problems, and residential instability (high frequency of homeowner/resident turnover in a neighborhood) (Bowen & Bowen, 1999; Cook-Craig et al., 2010; Nelson et al., 2010; U.S. Census Bureau, 2015). These characteristics have been shown to impact both macro-level crime and delinquency rates (Osgood & Chambers, 2003; Wells and Weisheit, 2004) and micro-level individual risk factors for delinquent behavior (Harden et al., 2009; Nelson et al., 2010).

In the current study, a theoretical framework, which systematically integrates macro- and micro-level concepts, is used to illustrate the relationship between risk factors and community type. First, social disorganization theory is used to identify which community characteristics are relevant to delinquency, and to explain how these characteristics (e.g., low SES, racial/ethnic heterogeneity, residential instability) influence informal social control (also known as collective efficacy). Weakened informal social control can contribute to higher delinquency rates. Second, the specific ways in which individual youths are affected by these community characteristics are explained by micro-level theories and perspectives, as well as past micro-level studies. The theoretical framework, along with the existing research on urban and rural community types, support this study’s expectations that risk factors for delinquency and the predictive ability of a juvenile risk assessment instrument will vary across youths living in urban and rural communities. Therefore, the main objective of this study was to examine how the level and type of risk for delinquency differ for offenders living in urban and rural communities across the state of Florida and how the predictive validity of a statewide juvenile risk assessment instrument varies across offenders living in urban and rural communities.

**Statement of the Problem**

Juvenile delinquency among Florida youth is an ongoing concern. In 2018, 59,473 youths were arrested in Florida (FDJJ, 2018), constituting 8% of all arrests in the state that year (Florida
Florida is home to more than 4.2 million youths under the age of 18; this number makes up 20% of the state’s population (Office of Juvenile Justice and Delinquency Prevention [OJJDP], 2019). By both the Office of Management and Budget’s (OMB) and Economic Research Service’s (ERS) definitions, the state is regionally divided almost equally between urban and rural areas, with nearly 35% of the residents living in rural communities (HHS, 2018).

Florida has a centralized juvenile justice system operating at the state level. Every youth who is processed into the FDJJ is assessed with the Positive Achievement Change Tool (PACT). PACT scores are used to predict how likely a youth is to reoffend, identify risk factors in his or her life, and aid in making appropriate treatment linkages. Thus, the information provided during the administration of the PACT provides an opportunity to investigate differences in the risk factors for delinquency and recidivism across youths residing in urban and rural communities across the state of Florida and whether or not these differences may lead to differences in the predictive validity of the PACT. Predictive validity of a risk assessment instrument is the extent to which a risk-to-reoffend score, generated by the instrument, predicts actual reoffending. Evaluating the validity of PACT predictions is essential for ensuring the youths are receiving the most suitable supervision and treatment, and for protecting the community from potential reoffenders.

**Research Questions**

This study examined three research questions:

- **RQ1**: Are there differences across level of risk for offenders living in urban and rural communities?
• RQ2: Are there differences across type of risk for offenders living in urban and rural areas?

• RQ3: Does the ability of the PACT to predict the odds of recidivism and the time to recidivism vary across offenders living in urban and rural communities?

Study Methods and Findings

There is a paucity of research validating the PACT. In Florida, two studies found that the instrument made valid predictions across gender, race/ethnicity, and age using data from 2007-2009, but did not examine validity across community type (Baglivio & Jackowski, 2013; Early et al., 2012). Other PACT validation studies in Florida focused on specialized versions of the PACT such as the Residential PACT (R-PACT) and also failed to consider differences across community type (Baglivio & Jackowski, 2015; Baglivio et al., 2015). The current study adds to the skant research on the PACT’s validity by evaluating the instrument using more recent data (as recent as 2017) and by examining the validity of the PACT across community type. More broadly, this study will add to existing research on subgroup differences (i.e., race, gender) across urban and rural communities in the performance and usefulness of risk assessment instruments during juvenile justice decision-making.

The current study utilized a non-experimental, retrospective research design using secondary data collected from FDJJ records and PACT scores for youths who scored moderate-high or high risk for recidivating on their initial PACT Pre-Screen assessment and were subsequently administered the PACT Full Assessment and sanctioned to probation. To accommodate the 12-month recidivism follow-up period of the study, only youths who were released from probation between January 1, 2013 and December 31, 2017 were included in the sample. Data on the youths’ demographic information, risk level, offending, and recidivism were
drawn from FDJJ’s archived central data records and PACT scores. The PACT scores from the assessment given closest to the youth’s referral date was used. Data used to categorize youths’ neighborhoods as urban or rural were drawn from the U. S. Census Bureau’s American Community Survey (ACS). Bivariate analyses (chi-square tests of significance, independent samples t-tests, area under the curve) and multivariate logistic regression and cox regression were performed to answer each of the three research questions.

Results showed both similarities and differences in the risk factors and predictive ability of the PACT across urban and rural youths. Youths residing in urban areas were more likely to be rated in the higher risk categories and the predictive accuracy of the PACT was stronger among urban youths. Regarding types of risk, most of the average PACT risk domain scores were similar for urban and rural youths. Differences were found for past antisocial behavior, current mental health problems, and current substance abuse where urban youths showed higher mean scores on each risk domain.

This study offers two key takeaways. First, most of the PACT risk domains were found to be similar across community type, suggesting that most intervention programs should work similarly across urban and rural youths. Second, the ability of the PACT to predict recidivism and time to recidivism was better for urban youths than for rural youths. The disparity in the PACT’s predictive ability disadvantages rural youths in the juvenile justice system in several important ways. It is critical for policymakers and researchers to address these differences in the PACT’s performance to ensure that fair and equitable decision-making occurs across the state, regardless of community type. The potential implications of these findings are discussed in Chapter 6 along with an acknowledgement of this study’s limitations and some suggestions for future research.
CHAPTER 2: LITERATURE REVIEW

Community Type: Urban and Rural

In the United States, over 81 million people are youths ages 18 and younger (U.S. Census Bureau, 2018). This is 25% of the population. While most youths live in urban areas across the United States, it is estimated that more than 6 million live in rural areas (HHS, 2016). Urban and rural areas have different characteristics. Several of these characteristics influence adolescent behavior. For example, urban areas are often characterized by exposure to environmental toxins, limited access to healthy food, noise pollution, and higher levels of violent crime (Evans, 2006). Rural areas are often found to have shortages of healthcare services and mental health care providers, and limited access to community and recreation centers (Evans, 2006; Gamm et al., 2002). Furthermore, community characteristics have a differential impact on behavior by creating, moderating, or mediating risk and protective factors that contribute to the development of criminality in youth (DeMatteo & Marczyk, 2005).

Variations in crime across urban and rural communities have been attributed to variations in the characteristics of urban and rural areas (Nelson et al., 2010; Wells & Weisheit, 2004). Studies on community type and crime have primarily focused on three categories of characteristics: ecological, social, and structural. Ecological characteristics focus on the physical features of a community, such as population size and density, and geographic isolation. Research suggests that the more crowded an area is, the more likely crime and conflict are to occur (Moore & Sween, 2015). Urban areas, by definition, have greater and denser populations than rural areas (ERS, 2013; U.S. Census Bureau, 2015). Rural areas have smaller, more spread-out populations, and are often geographically isolated by barriers such as mountains, rivers, distance, or even climate (Cook-Craig et al., 2010).
Social characteristics include factors such as racial/ethnic heterogeneity, residential instability, family problems, quality of educational services, availability of mental health services, leisure activities, religiosity, crime, and community cohesion. Studies have found that the more racially homogeneous, socially interactive, and residentially stable community members are, the less likely crime is to occur (Hirschi, 1969; Sampson et al., 1997; Shaw & McKay, 1942). Rural areas are typically more racially homogeneous than are urban areas and have higher levels of community cohesion (Nelson et al., 2010). Rural areas also have higher rates of residential stability (Bouffard & Muftic, 2006). However, rural areas, compared to urban areas, have limited social services such as treatment programs, shelters, law enforcement, and recreation centers, as well as schools, jobs, and healthcare providers (Cook-Craig et al., 2010; Dudgeon & Evanson, 2014; Perkins et al., 2002). Despite this, arrest rates are consistently found to be lower in rural areas compared to urban areas (FBI, 2012 a, b).

Structural characteristics of communities often focus on SES (e.g., poverty, need, and distribution of wealth) (Bowen & Bowen, 1999; Nelson et al., 2010; Wells & Weisheit, 2004). Studies have shown that higher rates of poverty and economic inequality increase crime rates due to blocked opportunities for success (Merton, 1932; Wells & Weisheit, 2004). In 2017, the urban poverty rate in the United States was 12.9% and the rural poverty rate was 16.4% (ERS, 2019b). Unemployment rates are similar across the two community types. In 2018, the urban unemployment rate was 3.9% and the rural rate was 4.2% (ERS, 2019a). However, economic inequality differs between urban and rural areas. Economic inequality, or relative deprivation, can occur when residents in a lower-income community feel they are unfairly denied access to resources and opportunities that are available to residents in higher-income communities. The greater the economic disparity between an economically-disadvantaged neighborhood and the
neighborhoods surrounding it, the higher the rates of crime, especially property crime (Chamberlain & Hipp, 2015). When considering spatial effects, residents in urban areas simply have more surrounding communities against which to compare their own community. Rural residents are more isolated from neighboring communities, thus characteristics to compare are less conspicuous (Chamberlain & Hipp, 2015).

Research focusing on community type and crime can be divided into macro-level studies and micro-level studies. Macro-level studies examine crime or delinquency across large groups that share a common identity, such as a geographical region of demographic characteristics. The aim is to describe or explain why some groups of people commit more crime than other groups of people, or why some areas have higher crime rates than others. The unit of analysis is most often a geographical unit (e.g., zip code) or a group of individuals (e.g., adolescents versus adults). Micro-level studies examine crime or delinquency among individuals. The aim is to describe or explain why some individuals are more likely or less likely to engage in crime or delinquency compared to other individuals. The unit of analysis is typically individuals (Akers & Sellers, 2013).

**Past Macro-Level Studies on Community Type and Crime**

Studies have consistently found that rates of serious crime and delinquency tend to be higher in urban areas than in rural areas (Moore & Sween, 2015; Osgood & Chambers, 2003; Weisheit & Donnermeyer, 2000; Weisheit et al., 1999). A study by Weisheit and Donnermeyer (2000) using 32 years of official police data in the U.S. found that violent crime rates were 5 to 10 times higher in urban areas than in rural areas, and property crime rates were 4 to 5 times higher in urban areas. Urban areas were defined as cities with 250,000 or more people; rural areas were defined as counties outside of the jurisdiction of municipal police departments, and
outside of the U.S. Census Bureau’s metropolitan statistical areas. Metropolitan statistical areas consist of urban areas (UAs) of 50,000 or more people and urban clusters (UCs) of 2,500-49,999 people (U.S. Census Bureau, 2019). In this study, the crimes most frequently committed in urban areas were found to be the same as those most frequently committed in rural areas, but the rates were much higher in urban settings. Notably, robbery rates were found to be 26 times higher in urban areas than in rural areas (Weisheit & Donnermeyer, 2000).

Wells and Weisheit (2004) used a nationally representative sample of 3,139 counties to analyze whether variables typically used to predict crime in urban areas can be used as effective predictors of crime in rural areas. Variables included: population density, residential instability (rent vs. own), family problems (single-parent vs. married), population change (current compared to prior five-year period), economic change (changes in median household income and percentage living in poverty), economic resources (median household income, percentage living in poverty, and percentage of adults with high school degrees), and racial/ethnic heterogeneity (language, foreign-born). Data for these variables were collected from U.S. Census reports. Uniform Crime Reporting (UCR) data were used for the dependent variables: violent and property crime. All data represented a five-year period from 1994 through 1998.

Of the eight independent variables, all of which are considered in the literature to be strong predictors of crime in urban areas, family disruption was the strongest predictor in rural areas. This is consistent with Osgood and Chambers (2003) findings of correlates of crime in rural areas. Racial/ethnic heterogeneity was as strong a predictor as family disruption, but only for violent crime; it was not a significant predictor of property crime. Population change was the second strongest predictor; as population increased, crime increased. Surprisingly, economic resources, which include the percent of the population living in poverty, was a weak predictor of
violent crime, but had a positive relationship with property crime. In other words, the more economic resources (and fewer people living in poverty) a rural county had, the more property crime it had. The remaining variables (population density, residential instability, economic change, cultural capital) had no significant association with violent or property crime in rural areas (Wells & Weisheit, 2004).

Osgood and Chambers (2003) used a sample of 264 counties to examine the impact of various community characteristics on the rates of violent juvenile delinquency in rural counties across the U.S. All the counties in the sample had populations of less than 98,000 people. Counties were considered “rural” because they were outside of the U.S. Census Bureau’s defined metropolitan statistical areas. Data came from the FBI’s Uniform Crime Reports (UCR) and were analyzed to measure delinquency rates of youth aged 11-17 years in each county over a five-year period ranging from 1989 through 1993. Violent juvenile delinquency was defined as homicide, forcible rape, aggravated assault, robbery, weapons offenses, and simple assault. Arrest rates were based on the number of arrests per county divided by the county’s juvenile population size.

Osgood and Chambers (2003) examined how the following community characteristics impacted rates of violent delinquency: residential instability, racial/ethnic heterogeneity, family disruption, SES, population density, and proximity to urban areas. Data for each variable were collected from the 1990 U.S. Census reports. They found that the characteristics with the strongest association to delinquency rates were residential instability, racial/ethnic heterogeneity, and family disruption. When Osgood and Chambers (2003) compared the findings of their study to previous studies (Bursik, 1988; Sampson & Groves, 1989; Shaw & McKay, 1942) which focused on urban areas, they found that these three variables increased the likelihood of
delinquency in rural as well as urban areas. Population size and density affected delinquency rates only within certain parameters; arrest rates increased as population size increased, but once the population reached 4,000, the effect dissipated. Proximity to urban areas had no significant impact on delinquency, and, notably, neither did poverty.

In a similar study, Moore and Sween (2015) tested whether variables commonly used to predict violent crime and delinquency rates in urban areas would successfully predict violent crime and delinquency rates in rural areas. Moore and Sween (2015) used predictor variables derived from social disorganization theories (i.e., residential instability, ethnic heterogeneity, family disruption, a high poverty rate, population density, unemployment, and population at risk). “Population at risk” is the proportion of the population between 15 and 24 years of age -- the group most likely to commit crime. All data for the predictor variables came from the U.S. Census Bureau. The dependent variable was violent crime committed by juveniles, measured by murder, rape, robbery, aggravated assault, weapons offense, and simple assault. Data on juvenile arrests for violent crimes were collected from the UCR.

Moore and Sween (2015) used a sample of 2,011 rural counties from 48 states. Counties were classified as rural if they were outside of a metropolitan statistical area designated by the U.S. Census Bureau. The counties in the sample ranged in population size from 41 to 190,000, with an average size of 24,580. Findings were consistent with other studies in that residential instability, family disruption, and racial/ethnic heterogeneity were strong predictors of violent crime in rural areas. Poverty was not a consistent predictor in other studies, and in this case, it did not predict all types of violent crime, but it was a strong predictor of murder. Population density was a significant and positive predictor, just as it was in Osgood and Chambers’s (2003) study. Finally, population at risk was a significant predictor of violent crime, but in an
unexpectedly negative direction; for every unit increase in population at risk, violence decreased by 2.6 units.

Taken together, macro-level studies consistently show that crime rates (Weisheit & Donnermeyer, 2000; Wells & Weisheit, 2004) and delinquency rates (Moore & Sween, 2015; Osgood & Chambers, 2003) are higher in urban areas compared to rural areas and that there are similarities and differences in the risk factors for delinquency across community type. These studies provide evidence that higher crime and delinquency rates are related to residential instability, family disruption, and racial/ethnic heterogeneity in both urban and rural areas (Moore & Sween, 2015; Osgood & Chambers, 2003; Wells & Weisheit, 2004). Furthermore, economic factors, such as poverty, which are predictive of higher rates of crime and delinquency in urban areas, are not found to be related to higher rates of crime and delinquency in rural areas (Moore & Sween, 2015; Osgood & Chambers, 2003).

Past Micro-Level Studies on Community Type and Crime

Additional studies have examined how various community characteristics differentially predict individual-level delinquent behavior among youths living in urban and rural areas. For example, using a sample of 113 male juvenile delinquents, aged 12-18 years, from three different county-level juvenile departments in Oregon, Nelson et al. (2010) examined the differences between urban and rural community factors on delinquency and antisocial behavior. The counties from which the sample was drawn were described as “one large urban county, one rural county in eastern Oregon, and one rural county in the coastal range” (Nelson et al., 2010, p. 122). No explanation of how these counties were categorized as “urban” or “rural” was given, but 50 participants were from the urban county and 63 were from the rural counties. Data collected from
the Youth Self-Report version of Achenbach’s Child Behavior Checklist showed that factors impacting delinquency differed across youth living in urban and rural counties.

For urban youth, personal risk and peer risk were strongly associated with an increased likelihood of offending. Personal and peer risks were defined as antisocial attitudes and behaviors of the youth and of his peers. Nelson et al. (2010) attributed this finding to the more densely populated neighborhoods and higher levels of anonymity in urban, versus rural, areas. For rural youths, family, community, and religious factors were strongly associated with an increased likelihood of offending. Family factors were defined as the level of family arguments and fights, parental concern, and family cohesion. Community factors were defined as community risks including drug sales, graffiti, street violence, and community protection including knowing one’s neighbors and the cultivation of a regional identity (Nelson et al., 2010). Some factors increased the risk of juvenile delinquency in both urban and rural areas. Poverty, existing levels of crime in the community, and family conflict all increased youths’ likelihood of offending, regardless of whether youths lived in urban or rural communities.

A longitudinal study by Harden et al. (2009) used a nationally representative sample ($N = 6,638$) of delinquent youths aged 10-17 years to examine how population density affects delinquency. Population density was measured on a county level. Though the study referred to the independent variable as population density rather than community type, whether the communities were urban or rural can be inferred from population density. Harden et al. (2009) looked at the population of a county and determined if the county itself was urban or rural based on the U.S. Census Bureau’s definitions.

Harden et al. (2009) found that the delinquent youths who lived the predominant portion of their adolescence (between 10 and 17 years of age) in urban areas had significantly higher
rates of mother-reported antisocial behavior, family problems, school problems, and self-reported delinquency than did youths who lived in rural areas. Also, youths living in urban areas during the time in which they were behaving delinquently had significantly higher rates of delinquency than did youths who lived in rural areas.

Overall, micro-level studies routinely find that youths living in urban areas were more likely to report engaging in delinquent behavior compared to youths living in rural areas (Harden et al., 2009). Among urban and rural youths, important risk factors for delinquency were family disruption, lack of community cohesion, and low SES. Antisocial attitudes of youths and peers were only significant for urban youths. Interestingly, of the most significant risk factors for urban and rural delinquency, family disruption was significant for both micro- and macro-level studies, whereas low SES played a more significant role in predicting delinquency at the micro-level than it did at the macro-level (Nelson et al., 2010; Osgood & Chambers, 2003).

Summary

The importance of community characteristics in describing, explaining, and predicting delinquency has been established, yet few studies have focused on individual-level delinquency and delinquency rates in rural communities (Bouffard & Muftic, 2006; Kaylen & Pridemore, 2013). Both macro- and micro-level studies have shown that while some factors that affect crime in urban communities also affect crime in rural communities (e.g., family disruption, racial/ethnic heterogeneity), several factors are not as equally influential across community type (e.g., poverty, antisocial peers). Nearly 20% of the U.S. population lives in rural areas of less than 2,500 people (U.S. Census Bureau, 2016). Taken together, empirical evidence suggests that a) there are differences in levels of delinquency across urban and rural areas, and b) the risk factors for delinquency may differ across these types of communities. Therefore, this study
expanded on these findings by examining whether the static and dynamic risk factors of adjudicated juvenile offenders placed on community supervision, identified using an evidence-based risk assessment instrument, vary by community type.

**Risk Factors and Needs among Juvenile Offenders**

Scholars have sought to identify behaviors, conditions, or characteristics of people or their environments that are predictive of, or increase the likelihood of, future criminal behavior. These behaviors and characteristics are known as criminogenic risk factors and needs. Effective principles of intervention draw largely on risk factors and needs, as well as the principle of responsivity. Together, these three principles make up the Risk-Need-Responsivity (RNR) model (Andrews et al., 1990). Risk factors and needs have been linked to adult offending as well as juvenile delinquency (Lipsey, 1999). Risk factors predict the likelihood of reoffending. They can be static, meaning they cannot be changed, or dynamic, meaning they can be changed. For example, a static risk factor is a history of prior offending; a dynamic risk factor is associating with antisocial peers. Furthermore, risk factors are found to have a cumulative effect: exposure to multiple risks compounds an individual’s likelihood of behaving delinquently (Coie et al., 1993).

Needs are circumstantial factors that can be changed with some sort of treatment or intervention, and the changes will influence the likelihood of future criminal behavior (Andrews & Bonta, 2010; Latessa & Lowenkamp, 2005). Oftentimes, dynamic risk factors and needs factors are interchangeable because they can change over time and should be the focus of intervention services. Responsivity is the principle that intervention and treatment programs should be tailored to the individual characteristics of the youth (e.g., gender, age, race/ethnicity, learning ability, motivation) (Andrews et al., 1990).
In the late 1990s, the juvenile justice field experienced a resurgence of rehabilitative practices and policies. Rehabilitation required targets for treatment: areas in youths’ lives in which intervention was needed, or in other words, dynamic or criminogenic risk factors. While medical researchers in the public health field were identifying factors that increased risks to patients’ health and wellbeing, juvenile justice researchers were identifying risk factors that increased juveniles’ likelihood of engaging in delinquent behavior. In both public health and juvenile justice, researchers sought to counteract or alleviate risk factors through identification (i.e., risk assessment) and targeted intervention services (i.e., responsivity) (Farrington, 2000; Latessa & Lowenkamp, 2005; Lipsey, 1999).

A large body of research has been devoted to identifying the major risk factors associated with delinquency. Researchers often group risk factors into classifications, or domains. Domains vary by title, type, and number across studies. For example, Andrews and Bonta (2010) identified eight domains, Borum et al. (2005) identified three, and Barnoski and Markussen (2005) identified thirteen. In 2001, the Office of the Surgeon General presented five domains into which the most common risk factors for delinquency were categorized (Shader, 2001). The five domains are: individual, family, peer group, school, and community. The following is a detailed discussion of the risk factors most consistently found to influence delinquency, grouped according to the domains identified by the Surgeon General.

**Individual Risk Factors for Delinquency**

Individual factors are micro-level characteristics or traits of a youth that place him or her at increased risk of delinquent conduct. Within the domain of individual risk factors, subcategories include demographic characteristics (i.e., gender, race/ethnicity, age), history of antisocial behavior, mental health problems, antisocial attitudes, antisocial peers, family
problems (including historical/early childhood experiences), problematic school experiences, antisocial leisure activities, and substance abuse.

**Demographic Characteristics**

**Gender**

It has been a long-established conclusion that boys engage in more delinquency than do girls. Using juvenile court records, Puzzanchera and Robson (2014) found that 75% of juvenile cases were males. Boys committed most (approximately 67%) of the status offenses in the U.S. in 2014. The only offenses committed more frequently by girls were running away from home and truancy (Hockenberry & Puzzanchera, 2019). Furthermore, self-reported offending rates from Monitoring the Future (MTF) of high school seniors showed that boys have a higher rate of illegal drug use, especially regarding heavy use. For nearly all illicit drugs, boys’ rate of use was more than twice that of girls (Miech et al., 2019).

**Race/Ethnicity**

The relationship between race/ethnicity and delinquency arrests has been consistently indicated by official statistics. Youths belonging to racial/ethnic minority groups are more likely to be arrested. In 2014, Black youths were five times more likely than White youths to be arrested. White youths and Native American youths were arrested at similar rates. Asian youths were the least likely to be arrested (OJJDP, 2015b). One limitation to OJJDP’s data is that it only includes delinquency known to police. Esbensen and Carson (2012) found no differences in self-reported rates of violent, property, and drug offenses across a five-year period. Similarly, Piquero (2015) concluded that self-reported delinquency rates are more similar across race/ethnicity than official arrest records. These findings support the findings from earlier studies.
that fail to find significant differences in offending across race/ethnicity (Farrington et al., 1996; Thornberry & Krohn, 2003).

**Age**

As youths get older, their likelihood of engaging in delinquency decreases. This phenomenon is known as the age-crime curve (Loeber & Farrington, 2014). According to the OJJDP, youths aged 15 to 17 years have the highest arrest rates (72%) per population of any age group (OJJDP, 2015a). Support for the age-crime curve has been found in several countries around the world and holds true across sex and race (Hirschi & Gottfredson, 1983; Lipsey & Derzon, 1998; Moffitt, 1993). Self-report data supports these findings. As part of the Utrecht Study of Adolescent Development longitudinal study, Landsheer et al. (2008) interviewed 3,954 youths and found that the peak age for delinquency was 16 years. Studies have shown that the age-crime curve is explained by the low levels of self-control and high levels of impulsivity, reckless behavior, and sensation-seeking typical of youths due to their brains not being fully developed until early adulthood (Loeb et al., 2012; Steinberg, 2010; Winfree et al., 2006).

**History of Antisocial Behavior**

Antisocial behavior is often defined as aggression, disorderly conduct, hyperactivity, difficulty with concentration, lying, fighting, stealing, impulsivity, risk-taking, and contact with or commitment into the juvenile justice system (Andrews & Bonta, 2010; Lipsey & Derzon, 1998; Nagin & Tremblay, 2001). Previous antisocial behavior is one of the strongest predictors of future delinquency. The younger an individual begins displaying such behavior, the more at-risk he or she is to engage in delinquency (Andrews & Bonta, 2010; Cottle et al., 2001; Loeber & Dishion, 1983; Simourd & Andrews, 1994).
**Mental Health Problems**

Youths with mental health problems are at a higher risk of engaging in delinquent behavior than are youths without such problems (Elliott et al., 1989; Hoeve et al., 2015). Mental health encompasses depression, suicidal ideation, anxiety, and attention-deficit hyperactivity disorder, as well as more serious psychological disorders such as antisocial personality disorder (Pederson, 1994; Wasserman et al., 2010). Studies have shown that slightly more than half (52%) of the youths in the juvenile justice system have mental health problems (Wasserman et al., 2010) compared to about 15-20% of the general population of youths aged 12 to 18 years (Merikangas et al., 2010; Roberts et al., 1998).

**Antisocial Attitudes**

In 1947, Sutherland found that antisocial attitudes had a significant impact on the likelihood of delinquent behavior in youths. He stated that youths who have attitudes based on “definitions” unfavorable to the law are more likely to act delinquently. “Definitions” include values, beliefs, and self-identity favorable to crime, but opposed to authority and law. Antisocial attitudes have been shown to be among the strongest predictors of delinquency. Essentially, if a youth thinks that an act is not wrong, even if the law defines that act as delinquent, then he or she is more likely to commit the act (Andrews & Bonta, 2010; Cuevas et al., 2019; Jones et al., 2012; Simourd & Andrews, 1994; Sutherland, 1947).

**Antisocial Peers**

Research has consistently found that one of the strongest predictors of delinquency for youths older than 12 years of age is peer associations (Andrews & Bonta, 2010; Cottle et al., 2001; Herrenkohl et al., 2000; Lipsey & Derzon, 1998; Moffitt, 1993). On the one hand, youths who have close associations with antisocial peers are at a higher risk of engaging in delinquent
behavior (Lipsey & Derzon, 1998). These findings are in line with social learning theories such as differential association which explains that delinquent behavior is learned within small, intimate groups. Individuals within these groups form definitions, based on past experiences and observations of others, of what constitutes lawful behavior in different situations. Some definitions favor obedience to the law more than do others. Individuals tend to adopt the definitions of the associates most prevalent in their life. (Burgess & Akers, 1966; Sutherland, 1947). On the other hand, youths who lack strong prosocial ties to peers have also been found to be at a higher risk of engaging in delinquency (Lipsey & Derzon, 1998). Consistent with the “attachment” aspect of Hirschi’s (1969) social bonding theory, ties to prosocial peers act as controls to keep people from acting delinquently. The control works because people usually act the way in which society expects. But when people lose interest or do not care what society thinks of their behavior, the controls fail, and people are free to act in deviant or delinquent ways.

**Family Problems**

Family factors are micro-level relationships, conversations, and other interactions between youths and close relatives that occur on a small, intimate scale. For younger adolescents, family factors have been found to have a strong impact on youths’ behaviors (Cottle et al., 2001). As youths age, peer influences and associations become more predictive than family factors (Herrenkohl et al., 2000; Lipsey & Derzon, 1998). However, family remains a key risk or protective factor for antisocial behavior. Aspects of the family domain include structural, historical/early childhood, and relational factors (Lipsey & Derzon, 1998).
Family Structure

Research dating at least as far back as Henri Joly’s 1889 study has shown that youths living in single-parent homes are at an increased risk of delinquency (Gove & Crutchfield, 1982). Several more recent studies have also found a relationship between delinquent behavior and family structure (e.g., Amato, 2001; Burt et al., 2008; Dembo et al., 1998; D’Onofrio et al., 2005; Price & Kunz, 2003; Rebellon, 2002). However, some studies found that living in a single-parent household was a weaker predictor of delinquency when researchers controlled for other risks, such as race/ethnicity, SES, characteristics of the child, closeness to parent, parental supervision, and intelligence levels of the parent (Crockett et al., 1993; Demuth & Brown, 2004; Nagin & Tremblay, 2001). Youths from families with lower SES have been found to be at higher risk of delinquent behavior than youths from higher SES families (Cottle et al., 2001; Farrington, 2003; Tarolla et al., 2002). Lipsey and Derzon (1998) reported similar findings, but only for youths six to 11 years old; the family SES of youths older than 11 years did not predict delinquency. Loeber and Dishion (1983) found family SES to be a significant indicator, but it was one of the weaker predictors. Simourd and Andrews (1994) found that family SES was not predictive of delinquency for youths of any age.

Criminal History of Family Members

From studies as early as the Gluecks’ (1950), it has been well established that youths with criminal parents are at a higher risk of delinquency than are other youths (McCord, 1991; Rowe & Farrington, 1997). For instance, Loeber and Dishion (1983) found that not only parental criminality but also a history of substance abuse among parents/siblings increased youths’ risk of delinquency. Several studies have shown that youths with delinquent siblings have a higher
Parenting Practices

The level of involvement of parents in their children’s lives has been shown to impact the likelihood of delinquent behavior (Amato, 1994; Barnert et al., 2015; Barnes & Farrell, 1992). More specifically, lower levels of parental involvement have been found to increase youths’ likelihood of delinquency (Barnes & Farrell, 1992; Hoeve et al., 2009; Steinberg, 2001). Involvement is different from supervision and attachment because parents can demonstrate high levels of involvement, but not maintain close supervision of, or warm emotional attachments with, their children. Other obstacles can exist, such as disciplinary styles or characteristics of the child, that weaken the attachment. Thus, supervision and bonding are addressed separately.

Parental discipline is categorized as authoritarian, authoritative, and indulgent. Authoritarian discipline incorporates negative aspects of parenting such as harsh punishment and withdraw of love. This type of discipline is associated with an increased risk of delinquency (Farrington, 1989; Hoeve et al., 2009). Authoritative discipline is firm and fair, characterized by positive aspects of parenting such as consistency and explaining the reason behind the discipline and ways the misconduct can be corrected. This type of discipline acts a protective factor, lowering the likelihood of delinquency (Hoeve et al., 2009; Steinberg et al., 2006). Finally, indulgent discipline practices are those in which the parental control of the child is very lax or nonexistent. Little or no guidance is given. This type of discipline is associated with increased delinquency and has been shown to be an even greater risk factor than authoritarian discipline (Farrington, 1989; Steinberg et al., 2006).
Travis Hirschi’s (1969) theory of social bonding centered the origins of bonding around parent-child attachment. Throughout his later work, he maintained that stronger parent-child bonds resulted in decreased delinquency (Gottfredson & Hirschi, 1990). The positive aspects of parental attachment are being accepting, affectionate, loving, warm, sensitive, and responsive. The negative aspects include being neglectful, hostile, and unaccepting (Rohner, 2004). Researchers have continued to find that weak parent-child attachments are predictors of delinquency (Barnert et al., 2015; Burt et al., 2006; Fosco et al., 2012; Johnson et al., 2011; Walton & Flouri, 2010) Additionally, Fosco et al. (2012) found that weak bonds between siblings increase risk of delinquency as well.

Youths whose parents provide high levels of supervision and monitoring (e.g., knowing the whereabouts and goings-on of one’s child) are less likely to act delinquently (Aunola & Nurmi, 2005; Dishion & McMahon, 1998; Keijzers et al., 2009; Lippold et al., 2014). One study found that the actual level of parental monitoring was not associated with decreased delinquency, rather the youth’s perception of high levels of parental monitoring deterred the youth from behaving delinquently (Wang et al., 2013). Classical criminological theorists such as Jeremy Bentham maintained that people’s actions are determined by the amount of pleasure or pain they will receive (Bentham, 1789). Through this perspective, high levels of parental monitoring would increase youths’ likelihood of receiving “pain” rather than “pleasure” when engaging in delinquent behavior.

**Problematic School Experiences**

School risk factors include poor academic performance, poor attendance, and attending a high-delinquency school. Poor academic performance, characterized by low grades and learning difficulties, has been associated with delinquent behavior (Dembo et al., 1998; Farrington, 1989;
Herrenkohl et al., 2000; Lipsey & Derzon, 1998; Simourd & Andrews, 1994). Likewise, poor attendance due to truancy, suspension, expulsion, dropping out, or any number of reasons for excessive absences has been linked to delinquent behavior (Lipsey & Derzon, 1998; McCord et al., 2001; Simourd & Andrews, 1994). Finally, Farrington (1989) found that boys who attended schools with high rates of delinquency were more likely to engage in delinquent behavior than were boys who went to other schools.

**Antisocial Leisure Activities**

Youths who do not effectively use leisure time by participating in prosocial activities may experience boredom. Ineffective uses of leisure time leading to boredom include idleness, prolonged television watching, or other activities that do not provide stimulation or satisfaction (Spaeth et al., 2015). Youths who experience frequent boredom are at a higher risk of engaging in delinquency than youths who do not experience boredom (Caldwell & Smith, 2006). Based on the view that idle hands are the devil’s workshop, the “involvement” aspect of social bonding theory explains why ineffective use of leisure time is associated with delinquent behavior. Involvement in prosocial activities strengthens conventional norms and values, increases an individual’s level of commitment to resisting temptations to act delinquently, and occupies one’s time and energy, leaving little for delinquent activities (Haynie & Osgood, 2005).

**Substance Abuse**

The association between substance abuse and delinquency has been consistently documented throughout the literature (Andrews & Bonta, 2010; Cottle et al., 2001; Loeber & Dishion, 1983; Simourd & Andrews, 1994). For example, Lipsey and Derzon (1998) found that substance abuse at early ages (6-11 years) was highly predictive of delinquency, but less predictive as the age of onset increased. However, other studies warn that temporal ordering has
not been sufficiently established to state that a causation, rather than a correlation, exists (Huizinga et al., 1993; Huizinga et al., 1989).

Variations in Risk Factors for Delinquency across Urban and Rural Areas

Urban and rural areas each have different ecological, social, and structural characteristics that have been shown to impact both delinquency rates and the likelihood of engaging in delinquent behavior. These differences include, but are not limited to, residential instability, racial/ethnic heterogeneity, family disruption, SES, population density, rapid change in population size, proximity to urban areas, and population at risk (the age group most likely to commit crime). Many of these differences carry the potential to lead to differences in the risk factors for delinquency across youths living in urban and rural areas (Evans, 2006; Gamm et al., 2002). This section provides an overview of the evidence that suggests that the risk factors for delinquency may vary across community type.

Variations in Individual Risk Factors Across Community Type

Individual risk factors, such as mental health problems, substance abuse, and antisocial attitudes have been shown to vary across youths living in urban or rural areas. Levin (2014) found that youths living in rural areas were more likely to experience poorer mental health and lower levels of happiness and wellbeing than were youths from urban areas. Galliher et al. (2004) found that rural youths, especially sexual minority (LGBTQ) youths, experienced higher levels of depression than did urban youths. Warner and Leukefeld (2001) found that chronic substance abusers were more likely to have grown up in a rural rather than an urban environment, yet the Substance Abuse and Mental Health Services Administration (SAMHSA) reported that urban substance abusers participated in treatment programs at a rate more than four times higher than rural substance abusers (SAMHSA, 2012). Elgar et al. (2003) found that
youths from urban areas had higher rates of antisocial behavior, mental health problems, and
substance abuse than youths from rural areas; however urban youths were more likely to receive 
interventions for antisocial behavior and participate in treatment programs for mental health care 
and substance abuse (SAMHSA, 2012).

There were several reasons why rural youths do not seek or participate in treatment to the 
extent that urban youths do. Residents of rural areas, which are geographically isolated, typically 
have further commutes to treatment than those from urban areas, increasing rural youths’ 
treatment attrition rates. Depending on their location, rural residents might have rough terrain or 
extreme weather that limits access to treatment providers (Story et al., 2016). Another obstacle 
exacerbating the already long travel times to treatment in rural areas is the lack of public 
transportation services (Gamm, 2004; Sung et al., 2011). Rural areas typically have shortages of 
healthcare services and mental health care providers (Gamm et al., 2002) and are less likely than 
urban areas to have highly educated people to provide treatment (Edmond et al., 2016). Youths 
living in rural areas are less likely than those living in urban areas to have private insurance to 
alleviate costs of treatment (Smith & Medalia, 2015; Ziller et al., 2008). Finally, fear of social 
stigma has been cited as one of the strongest reasons why youths do not seek or stay in treatment 
programs (Chandra & Minkovitz, 2007). Because rural areas tend to have more close-knit 
communities than do urban areas, youths might feel a lack of privacy when seeking or attending 
treatment, which increases fear of being stigmatized (Larson & Corrigan, 2010). Furthermore, 
rural areas, more than urban areas, promulgate values of self-reliance, distrust of outsiders 
(including therapists or counselors), and expectations that family, church, and “native” townsfolk 
should take care of such issues (Judd et al., 2006; Stewart et al., 2016).
Youths with antisocial attitudes tend to adopt those attitudes from the peers with which they have close and frequent associations (Sutherland, 1942). Urban settings are densely populated, so the frequency with which a youth will associate with other youths is higher than in rural settings. Plus, urban communities have greater access to community and recreation centers where youths can spend time with peers and meet new peers (Evans, 2006). Thus, due to the increased frequency that urban youths associate with each other, the likelihood of a youth having peers with antisocial attitudes is higher in urban areas than it is in rural areas.

Variations in Family Risk Factors Across Community Type

Family risk factors for delinquency have been found to vary across community type (Cottle et al., 2001; Farrington, 2003; Osgood & Chambers, 2003; Tarolla et al., 2002). For example, research has found that youths from single-parent households were more likely than youths from intact households to behave delinquently (Juby & Farrington, 2001). According to the U.S. Census Bureau (2016), youths living in urban areas are more likely to live in single-parent households. Studies have also shown that youths from families with lower SES are found to be at higher risk of delinquent behavior than youths from higher SES families (Cottle et al., 2001; Farrington, 2003; Tarolla et al., 2002). U.S. Census Bureau (2016) data also show that youths living in urban areas are more likely to live in poverty. Moreover, Brody and Flor (1998) found that families living in poverty in rural areas in the South provided firm, fair, positive discipline for their children. Rural parents had strong spiritual beliefs, high church attendance, and close ties with extended family, all of which supported practices of effective parental discipline as well as high levels of parental involvement in a child’s life. Youths who frequently change residences, whether within the same neighborhood or between cities or states, have a higher risk of delinquency than do youths who do not move frequently (Adam & Chase-
Lansdale, 2002; Cotton, 2016; Haynie & South, 2005). Youths from urban areas are more likely to move frequently (Bouffard & Muftic, 2006). Thus, in line with the research described above, single-parent households, low family SES, and frequently moving may be stronger risk factors for delinquency for urban versus rural youths.

**Variations in Peers and Leisure Activities Across Community Type**

Associations with peers have been found to vary across urban and rural settings (Evans, 2006). Youths who have close associations with antisocial peers are at a higher risk of engaging in delinquent behavior (Lipsey & Derzon, 1998). Urban settings are densely populated, so the frequency with which a youth will associate with other youths is higher than in rural settings. Associating with delinquent gang members is more likely to occur in urban areas than in rural areas. The National Gang Center (2014) found that 95% of gangs are located in urban areas; only 5% of gangs are located in rural areas. Plus, urban communities have greater access to community and recreation centers where youths can spend time with peers and meet new peers (Evans, 2006). Thus, due to the increased frequency that urban youths associate with each other, the likelihood of a youth having delinquent peers is higher in urban areas than it is in rural areas.

Compared with rural youths, urban youths more often have close ties with antisocial peers and are at a higher risk for delinquency. However, rural youths face a different dilemma: less access to community and recreation centers. Quinn et al. (2015) found that urban communities were more likely to provide public recreational facilities and programs. Furthermore, urban recreational facilities and programs were more likely to have free or discounted costs-of-use for youths than were rural facilities and programs (Quinn et al., 2015). Hansen and Hartley (2015) found that geographic isolation, safety fears, cost, lack of transportation, and underdeveloped infrastructure (e.g., lack of sidewalks, unpaved shoulders
alongside roads, lack of pedestrian crossings) are obstacles to building, maintaining, or accessing community recreational facilities in rural areas. Thus, engaging in antisocial leisure activities may be a stronger risk factor in rural areas than in urban areas.

**Variations in School Risk Factors Across Community Type**

Urban schools differ from rural schools in ways that may affect delinquency (McIntire et al., 1990; Prater et al., 1997). Rural schools, in general, have smaller populations than urban schools. They are organized in a less centralized fashion than are urban schools, meaning that rural schools rely more on informal, community-level controls than on a unified, bureaucratic system. The teacher-to-student ratio is usually lower in rural schools, so communication and controls are more personal and based on quality, rather than quantity (McIntire et al., 1990). Risk factors such as poor attendance and performance could be more easily identified and improved in the less populated rural school (Lipsey & Derzon, 1998). Moreover, social ties to prosocial peers, which act as controls to keep people from acting delinquently, are likely to be strengthened in the close-knit, interpersonal, rural schools (Hirschi, 1969). Finally, Farrington (1989) found that boys who attended schools with high rates of delinquency were more likely to engage in delinquent behavior than were boys who went to other schools.

**Summary**

Criminogenic risk factors and needs of people or their environments predict or increase the likelihood of criminal behavior. Risk factors also predict the likelihood of reoffending. They can be static, meaning they cannot be changed (e.g., prior offending), or dynamic, meaning they can be changed, (e.g., association with antisocial peers). Dynamic risk factors and needs factors can change over time and in response to treatment programs and should, therefore, be the focus of intervention services and rehabilitation. Risk factors and needs are often grouped into
classifications, or domains, which generally include individual, family, peer group, school, and community domains. The studies discussed above show that risk factors vary across urban and rural areas. The next section discusses risk and needs assessment instruments used throughout the history of juvenile justice systems and presents a review of how well these instruments are predicting in general as well as across various subgroups.

**Juvenile Risk and Needs Assessment**

**Juvenile Justice Risk Assessment Instruments**

As of 2017, 38 states have adopted a standardized, statewide risk assessment instrument to use throughout their juvenile justice system. The remaining states assess at a regional or local level (Puzzanchera, 2017). The purpose of risk assessment instruments is to provide practitioners with a standardized, theoretically-sound process for identifying juvenile offenders’ risk to reoffend. These assessments are then used to inform juvenile justice decisions including disposition, progress towards reducing risk factors, and intervention needs. Empirically-based risk assessment instruments were developed to address criticism regarding unstructured clinical judgements made by practitioners during their assessments of risk; criticism included concerns about possible inconsistencies, inaccuracies, and biased decision-making (Andrews et al., 2006; Grove & Meehl, 1996; Hilterman et al., 2013). Most of the commonly used risk assessment instruments today are able to moderately predict a youth’s level of risk for reoffending and aid in the selection of proper treatment and interventions for the youth based on his or her identified needs (Hoge, 2002; Olver et al., 2009; Viljoen et al., 2008).

**Evolution of Juvenile Risk Assessments**

Juvenile risk assessments were created in the 1970s (Baird et al., 2013). The process by which juveniles are assessed for risk of reoffending and linked to appropriate treatment programs
and interventions has substantially changed over the past few decades. Four distinct generations of risk assessment instruments have been identified (Bonta, 1996). First-generation risk assessment instruments involved the clinical judgment of juvenile justice professionals. No standardized system existed, and no statistical methods were employed. Individual practitioners used their discretion to classify the level (e.g., low, moderate, high) of risk of the youth’s likelihood to reoffend (Baird et al., 2013; Schwalbe, 2007a). Limitations to first-generation assessment instruments include the introduction of personal biases and beliefs into assessments, inconsistent classification of risk level, and weak predictive validity (McCafferty, 2017).

Second-generation risk assessments marked the start of using statistical strategies in predicting the likelihood of reoffending (Baird et al., 2013; Schwalbe, 2007a). Risk factors were weighted based on the findings of research regarding the risk factors’ significance as predictors of delinquent behavior (Baglivio & Jackowski, 2013). However, these actuarial assessments only incorporated static risk factors such as prior offending and age of onset. For this reason, second-generation assessments were limited to prediction and classification (Schwalbe, 2007a). Examples of second-generation juvenile risk assessment instruments are the North Carolina Assessment of Risk (NCAR) (Schwalbe, 2007a) and the Juvenile Sexual Offense Recidivism Risk Assessment Tool-II (J-SORRAT-II) (Viljoen et al., 2008). Linkages to treatment programs could not be informed through these risk assessments because no dynamic risk factors were included in the instruments.

Third-generation assessments used an actuarial system, more complex than that of the second-generation, to measure both static and dynamic factors (Baglivio & Jackowski, 2013; Baird et al., 2013; Schwalbe, 2007a). The addition of dynamic factors, which are risk factors in a youth’s life that can be changed, enabled third-generation assessments to be used for two
purposes: prediction of risk to reoffend and case management/intervention planning. For example, an assessment that indicates a youth has significant issues with substance abuse would help inform practitioners in developing an intervention plan that links the offender to substance abuse treatment. Or, association with anti-social peers could lead to connecting the youth with a prosocial mentor (Schwalbe, 2007a). An example of a third-generation juvenile risk assessment instrument is the WSJCA (Barnoski & Markussen, 2005).

Finally, fourth-generation risk assessments built upon previous generations, and added three more components: reassessment(s), responsivity, and protective factors (Baglivio & Jackowski, 2013; Baird et al., 2013). The test/retest(s) component helps measure the effectiveness of treatment programs as well as the increase of protective factors in a youth’s life. Protective factors are conditions and/or characteristics of a youth’s circumstances and environment that counteract or reduce risk factors. The number of protective factors in a youth’s life can help measure responsivity, which is a youth’s “readiness” to respond to rehabilitative efforts (Baglivio & Jackowski, 2013; Baird et al., 2013). Examples of fourth-generation juvenile risk assessment instruments in use today are the Youth Level of Service/Case Management Inventory (YLS/CMI) (Andrews et al., 2006), the PACT (Baglivio & Jackowski, 2013), the Correctional Assessment and Intervention System (CAIS), and the Correctional Offender Management Profiling for Alternative Sanctions (COMPAS) (Andrews et al., 2006).

Risk assessment instruments often group risk factors into classifications, also called domains. The most common domains found on risk assessments are history of delinquency, school status, employment status, use of leisure time, peers, family, substance use, mental health, attitudes, and personality (Andrews et al., 2006; Brennan et al., 2009; FDJJ, 2012b). These domains are used in the PACT, which is the focus of the current study.
**Predictive Validity of Juvenile Risk Assessments**

To date, most research on juvenile risk assessment instruments has focused on predictive validity. Predictive validity is the extent to which a score, most often the risk score, predicts recidivism. In general, research suggests that juvenile risk assessment instruments moderately predict general, violent, and nonviolent recidivism. Olver et al. (2009) analyzed 49 studies that evaluated the YLS/CMI, Structured Assessment of Violence Risk in Youth (SAVRY), and Hare’s Psychopathy Checklist-Youth Version (PCL-YV). They found that all three instruments significantly predicted risk, but the YLS/CMI and PCL-YV were slightly more effective at predicting general and nonviolent delinquency, while the SAVRY was slightly better at predicting violent delinquency. All but two of the studies yielded moderate or high effect size estimates (e.g., AUC > .50).

**Predictive Validity of Juvenile Risk Assessment Instruments Across Groups**

As risk assessment instruments have evolved, the importance of the validity of these tools across different groups has also received attention. (Olver et al., 2009). Equity in predictive validity across group characteristics (e.g., gender, age, race/ethnicity) reduces the chance of disproportionately disadvantaging certain groups. This occurs when the instrument overpredicts for some groups and/or underpredicts for others. The problem with this is that some youths might receive too much or too little treatment, supervision, and resources. As risk assessment instruments continue to evolve, researchers continue to evaluate variations in their predictive abilities across different groups. Some studies have shown that the predictive validity of risk assessment instruments varies across certain conditions or characteristics such as gender and race/ethnicity (Baglivio & Jackowski, 2013), however, as more studies are conducted, the more
it seems as if there are not strong differences in predictive validity across groups (Olver et al., 2009; Schwalbe et al., 2006; Schwalbe, 2008).

**Predictive Validity Across Gender**

Schwalbe et al. (2006) found that the NCAR had a higher level of predictive ability for males than it did for females. Sharkey et al. (2003) found that the Orange County Risk Scale, a risk assessment instrument used in Orange County, California, had a higher level of predictive ability for male youths than it did for female youths. Baglivio and Jackowski (2013) found that the PACT maintained similar predictive abilities across gender but noted that criminal history was the strongest predictor of male offending, whereas no factors predicted female offending. Using a sample of 536 court-involved juveniles, Schwalbe (2007b) evaluated the predictive validity of two juvenile risk assessment instruments, the NCAR and the Joint Risk Matrix, across gender. The study found the risk assessment instruments predicted risk at a statistically significant level of effectiveness. After controlling for gender differences in patterns of out-of-home placements, the predictive validity of the instruments did not vary across gender. Schwalbe (2008) conducted a meta-analysis of 19 prospective longitudinal studies that examined the predictive validity of 20 risk assessment instruments given to juveniles. The instruments had been previously validated, but the validation studies did not include thorough analyses of potential moderating effects of gender on the instruments’ predictive ability. Schwalbe (2008) found that the predictive validity of the risk assessment instruments did not significantly vary by gender. The only time gender became significant in was when the risk assessments were used for youths who had high recidivism rates (70% or greater).
Predictive Validity Across Race/Ethnicity

Regarding race/ethnicity, differences in predictive ability were found for some instruments (Baglivio & Jackowski, 2013; Schwalbe et al., 2006), but not others (Flores et al., 2004; Onifade et al., 2009). Baglivio and Jackowski (2013) used a sample of 15,168 male and female juvenile offenders to examine the predictive validity of the PACT across race/ethnicity. The youths were tracked for 12 months after release from probation; recidivism was indicated by both a new arrest (either a juvenile referral or an adult arrest depending on the subject’s age during the 12-month follow-up period). They found that the predictive ability of the PACT was not as strong for Black males as it was for White and Hispanic males. The discrepancy occurred most frequently when distinguishing between moderate-high and high-risk youths. Using a sample of 9,534 male and female juvenile offenders, Schwalbe et al. (2006) found that the NCAR had a higher level of predictive ability for White youths than it did for Black youths. The NCAR underpredicted recidivism for Black youths, where recidivism was indicated by a new adjudication for a juvenile offense.

In contrast, Onifade et al. (2009) used a sample of 968 male and female juvenile offenders to determine whether the predictive ability of the YLS/CMI was influenced by race/ethnicity. Recidivism was indicated by any new civil petition (i.e., juvenile referral, arrest) within the 24 months following the first administration of the YLS/CMI. Onifade et al. (2009) found that there was no difference in the YLS/CMI’s predictive validity of reoffending across race/ethnicity. Though the instrument’s strongest predictive power was with White females, and its poorest predictive powers were for Black males, the differences in predictive ability were not statistically significant (Onifade et al., 2009). In one of the largest studies conducted so far, Flores et al. (2004) used a sample of 1,671 male and female juvenile offenders, and, like Onifade et al. (2009), found that the YLS/CMI’s predictive validity was consistent across race/ethnicity.
The relationship between race/ethnicity and predictive validity grew even more complex when studies found that some components of the predictive ability of an instrument were vulnerable to differences in race/ethnicity, but other components were not (Vincent et al., 2011). Vincent et al. (2011) tested the predictive validity of the SAVRY, which includes protective factors as well as risk factors. Using a sample of 480 male juvenile offenders, Vincent et al. (2011) found that the SAVRY was predictive of violent rearrests for all racial/ethnic groups but was predictive of nonviolent arrests for White youths only. Recidivism was indicated by a new arrest, and new arrests were broken down into arrests for either violent or nonviolent offenses. When the predictive ability of protective factors for time-to-rearrest was analyzed, they were found to be equally predictive for all racial/ethnicity groups for both violent and nonviolent rearrests (Vincent et al., 2011).

**Predictive Validity Across Community Type**

Schwalbe et al. (2006) pointed out that one reason for the variations in risk assessments’ predictive abilities across different conditions and characteristics could be “omitted variable bias” which occurs when “excluded risk factors are disproportionately distributed across populations” (p. 308). If, for example, variables more relevant to female offending than to male offending are omitted or underrepresented in an instrument, the predictive power for the instruments regarding females is diminished. That said, it is reasonable to suggest that omitted variable bias could be a factor in predictive ability across community type. Several characteristics, such as SES, residential stability and likelihood of associating with delinquent peers, differ across urban and rural communities. (Bouffard & Mufic, 2006; Evans, 2006; Smalley et al., 2010; Thomas & Holzer, 2006). It has also been shown that several of these characteristics are associated with delinquency (Cottle et al., 2001; Elgar et al., 2003; Evans,
Therefore, it is important to study the predictive validity of juvenile risk assessment instruments across community type.

The majority of studies on juvenile delinquency and juvenile risk factors have focused on urban areas (Bouffard & Muftic, 2006; Kaylen & Pridemore, 2013). Furthermore, of the existing studies comparing urban and rural communities, risk factors have been consistently shown to vary across community type, suggesting that one instrument might not be sufficient for accurately predicting risk in both types of communities. If a risk assessment instrument is not predicting with as much validity in one type of community as it is in another, then the youths who reside in the community where the validity is weaker will experience a higher likelihood of being under- or over-sanctioned. The consequences of over-sanctioning a youth who, in actuality, has a low risk of recidivism but scored high (i.e., high risk of reoffending) on the instrument, include spending already strained resources on the youth and exposing the youth to the negative impacts of labeling (Lemert, 1951). Conversely, under-sanctioning a youth who, in actuality, has a high risk of recidivism but scored low on the instrument, can have much more detrimental consequences. First and foremost, the youth might pose a threat to the community or to himself or herself; without adequate supervision or sanctions, the youth’s potential to recidivate would be increased. Second, the deterrent power of the sanctions might not be enough to impact the youth and decrease the likelihood of recidivism. Lastly, inaccurate prediction could result in systemic missteps such as budgeting miscalculations, staff surplus or shortage, and loss of trust in the justice system by citizens.

While these consequences are likely to impact any community negatively, rural areas would be particularly hurt. Rural areas already tend to have shortages, sometimes severe.
shortages, of effective treatment programs and qualified staff (Edmond et al., 2016; Thomas et al., 2009). If the resources that are available are being used and distributed inefficiently, then youths who most need them could be underserved. Furthermore, it is difficult to attract qualified staff to rural areas, and mismatching youths to treatment referrals could further exacerbate the unwillingness of providers to serve in those areas (Edmond et al., 2016; Pathman et al., 2004). Finally, youths from rural areas are more likely than youths from urban areas to be under- or uninsured (Smith & Medalia, 2015; Ziller et al., 2008). Court-required treatment that is unnecessary or not appropriately matched to youths’ needs could become costly for the youths and their families.

Summary

Juvenile risk and needs assessments are used nationwide. Their purpose is to provide practitioners with a standardized, theoretically-sound process for identifying juvenile offenders’ risk to reoffend. These assessments are then used to inform juvenile justice decisions including disposition, progress, and intervention needs. Risk assessment instruments have gone through four generations of evolution, with the most recent fourth generation instruments using actuarial methods rather than practitioner discretion, and include reassessment(s), dynamic risk factors, and protective factors (Baglivio & Jackowski, 2013; Baird et al., 2013). The predictive validity of risk assessment instruments has been the focus of several studies, with results suggesting that the instruments moderately predict general, violent, and nonviolent recidivism (Edens et al., 2007; Olver et al., 2009). The predictive validity across gender and race/ethnicity has been evaluated as well, with inconsistent results (Baglivio and Jackowski, 2013; Flores et al., 2004; Onifade et al., 2009; Sharkey et al., 2003; Schwalbe, 2007b). The predictive validity across community type has not been widely researched. The current study adds to the literature by
examining the predictive validity of a juvenile risk assessment instrument in Florida (i.e., the PACT) across urban and rural counties.

Chapter Summary

In the United States, nearly 42 million people, more than 13% of the population, are youths between the ages of 10 and 19 years (HHS, 2016). In 2016, more than 856,000 youths in this age group were arrested (OJJDP, 2017). Though many youths live in urban areas, about 14% live in rural areas (HHS, 2016). Crime and delinquency have been shown to vary across urban and rural community types, with both macro- and micro-level studies consistently finding that rates of serious crime are higher in urban areas than in rural areas (Osgood & Chambers, 2003; Weisheit & Donnermeyer, 2000; Weisheit et al., 1999). Though several of the community characteristics that influence crime were the same in both urban and rural areas, those characteristics were not as equally influential across community type (Osgood & Chambers, 2003; Wells & Weisheit, 2004).

These varying community characteristics create individual, family, social, and community risk factors of delinquency and needs among juveniles that either exacerbate or alleviate delinquent behavior. Because community characteristics vary across community type, risk factors and needs may vary in type and strength as well, depending on whether an area is urban or rural. Consequently, there are likely differences in types of risks and levels of delinquency for juvenile offenders living in urban and rural areas.

One of the essential roles of juvenile risk assessment instruments is to assist in making juvenile justice system-level decisions that are appropriately individualized to meet the needs of each juvenile offender. If the predictive validity of a risk assessment instrument is stronger or weaker depending on community type, then appropriate levels of supervision and treatment
linkages cannot be consistently established. Because level and type of risk for offenders vary across community type, it is reasonable to think that the usefulness of risk assessment instruments in making predictions about risk for recidivism may vary between urban and rural communities.

Juvenile justice risk assessment instruments have been shown to hold moderate to strong levels of predictive validity (Baglivio, 2009; Betchel, Lowenkamp, & Latessa, 2007; Hiscox et al., 2007). Equitable measurements of predictive validity are important in order to prevent future delinquency and/or negative youth outcomes among different groups of juvenile offenders. Inequitable measurements occur when the instrument overpredicts for some groups and/or underpredicts for others. Studies have found inequities across gender and race/ethnicity (Baglivio & Jackowski, 2013; Schwalbe et al., 2006). However, research has not examined how well juvenile risk assessments perform across urban and rural areas. Coupled with studies that have found that risk factors vary across community type, it is possible that the predictive validity of risk assessment instruments varies across offenders living in urban and rural areas as a result of missing variable bias and/or attention to the wrong risk and need factors when assessing risk to reoffend and intervention needs. Therefore, the goals of this study are to identify differences, if any, in the level and type of risk for offenders living in urban and rural communities, and to measure the predictive validity of a juvenile risk assessment instrument across offenders living in urban and rural communities.
CHAPTER 3: THEORETICAL FRAMEWORK

The current study examines variations in micro-level variables (i.e., level and type of individual risk factors for delinquency) across community type (urban and rural areas). The study also investigates whether the ability of a juvenile risk assessment instrument to predict an individual’s risk of recidivism differs across community type. According to past research on delinquent behavior, individual-level variables must be examined within the context of the macro-level system in which the individual resides (Brooks-Gunn et al., 1993). Community characteristics influence the behaviors, attitudes, values, and opportunities of the youths living in those communities (Brooks-Gunn et al., 1993). For example, the type of community in which a youth resides (i.e., macro-level variable), can influence micro-level variables such as witnessing violence at a young age and, in turn, being more likely to engage in violent behavior (Patchin et al., 2006). This section will describe a theoretical framework which systematically integrates macro- and micro-level concepts to show why risk factors for delinquency and the predictive ability of a juvenile risk assessment instrument were expected to vary across urban and rural communities. While the purpose of the current study is not to test specific theoretical frameworks, it is still important to use theories as a framework with which to guide the hypotheses of the current study.

Social Disorganization Theory

The foundation of this study’s theoretical framework is that macro-level community characteristics vary across urban and rural areas. Previous studies (described above) support this premise (Bouffard & Muftic, 2006; Moore & Sween, 2015; Nelson et al., 2010; Osgood & Chambers, 2003; Sampson et al., 1997; Weisheit & Donnermeyer, 2000; Wells & Weisheit, 2004). The specification of which community characteristics directly or indirectly influence
delinquency (and, as the framework will eventually show, individual risk factors for delinquent behavior) is informed by social disorganization theory (SDT). SDT posits that community characteristics influence informal social control (also known as collective efficacy), which, in turn, affects delinquency rates. In other words, the concept of collective efficacy (informal social control) mediates the relationship between structural characteristics and delinquency rates. The structural characteristics that constitute social disorganization are low SES, racial/ethnic heterogeneity, residential instability, family disruption, and urbanization (Shaw & McKay, 1942). The relationships between these macro-level characteristics and delinquency are described in a previous section. The individual components of collective efficacy are discussed in the following section.

**Collective Efficacy**

Collective efficacy is characterized by a community effort to supervise youths and intervene when disorderly or criminal behavior is taking place (Bandura, 2000; Raudenbush & Sampson, 1999; Sampson et al., 1997). Areas with higher levels of collective efficacy are comprised of residents who know and trust each other. Informal social control is created through residents’ familiarity with each other, which makes it easier to identify strangers, or individuals who are somewhere they should not be. Informal social control is also strengthened by shared goals and values, which encourage residents to communicate and support each other when intervention is necessary to prevent criminal or disorderly conduct. Some examples of informal social controls generated by collective efficacy are the willingness of a resident to supervise groups of youths in public areas, to confront individuals who are exploiting public resources, and to stop public disputes (Sampson et al., 1997). Social disorganization in and of itself does not directly impact delinquency, but it does weaken informal social control by decreasing collective
efficacy. Decreased collective efficacy has been shown in the literature to be associated with increased delinquency rates (Meier et al., 2008; Raudenbush & Sampson, 1999; Sampson et al., 1997; Schreck et al., 2009).

The current study seeks to understand whether variations in the level and types of individual-level risk factors for delinquent behavior (e.g., antisocial behavior, substance abuse) as well as the predictive validity of a juvenile risk assessment instrument, vary across community type. SDT outlines the social structures (low SES, racial/ethnic heterogeneity, residential instability, family disruption, and urbanization) and informal social control mechanisms (components of collective efficacy) that affect delinquency rates (Shaw & McKay, 1942). Moreover, collective efficacy varies across community type in ways that impact the level and types of individual risk factors for delinquent behavior in each type of community (urban and rural). For collective efficacy to thrive, residents must know and trust each other in order to identify strangers or potentially troublesome neighbors. Residents must also share common goals and values that encourage communication and support when intervention is necessary to prevent disorderly or criminal conduct. Rural areas tend to have more close-knit communities than do urban areas (Larson & Corrigan, 2010). Residents of rural areas rely on each other, rather than people from outside of the community, to take care of problematic issues (Judd et al., 2006; Stewart et al., 2016). Communities with large, dense populations and rapid shifts in population could have difficulty establishing collective efficacy. Urban communities have large populations and are more likely to have rapid shifts in population than are rural communities (Bouffard & Muftic, 2006; ERS, 2013; U.S. Census Bureau, 2015). Likewise, communities with racial/ethnic heterogeneity could have difficulty establishing collective efficacy due to cultural and language barriers (Osgood & Chambers, 2003). Urban communities have more racial/ethnic heterogeneity
than do rural communities (Nelson et al., 2010). Thus, collective efficacy will likely be higher in rural areas than in urban areas, differentially influencing the level and types of risk factors for delinquent behavior in each area.

**Individual Risk Factors for Delinquency**

According to Andrews and Bonta (2010), the risk factors most strongly associated with delinquent behavior are known as the “Central Eight.” These factors include antisocial behavior, antisocial personality pattern, antisocial attitudes, antisocial peers, family problems, problematic school experiences, antisocial leisure activities, and substance abuse. A closer examination of risk factors and the specific community characteristics that impact each risk factor, as well as the theories guiding these connections, follows.

The first half of the “Central Eight” risk factors constitutes the “Big Four,” which Andrews and Bonta (2010) describe as “the major predictor variables and indeed the major causal variables in the analysis of criminal behavior of individuals” (p. 55). Due to the importance of the “Big Four” in predicting delinquent behavior, further discussion is warranted in connecting how individual indications of antisocial behavior, personality, attitudes, and peers are influenced by community-level factors such as SES, racial/ethnic heterogeneity, and urbanization. The “Big Four” have an important commonality: their inclusion of “antisocial” characteristics. According to Meier (1989), in order for an “antisocial” to exist, a “social” must exist.

The construction of acceptable social norms, values, goals, and behaviors is built through the process of social differentiation, in which differences, actual or supposed, among people are observed and people are categorized into social positions based on these differences (Meier, 1989). These differences include SES components such as level of education, occupation, and
wealth. Once differentiation is established, stratification occurs when members of a society rank the differences among themselves, placing higher social, economic, and political value on some positions, but not others. Members in the more highly valued social strata obtain more resources than do members of less valued social strata. Social controls, consisting of laws, norms, and values, are put into place to protect the social status of members in the elite groups. Individuals who do not conform or adhere to these social controls are seen by other members of society as deviant or antisocial. Thus, antisocial characteristics of individuals “cannot be adequately grasped apart from [the] social context,” nor “without an understanding of political processes, the allocation of scarce economic and environmental resources, the nature of social interaction, and the operation of institutional systems [such as] family, education, and occupation” (Meier, 1989, p. 206).

As further discussion will show, all the “Central Eight” risk factors, as well as various micro-level theories of delinquent behavior, stem from political processes, the allocation of resources, social interaction, and institutional systems. In the language and terms of SDT, “political processes” can be understood as formal social controls such as laws, law-making, and law-enforcement, “the allocation of scarce economic and environmental resources” can be understood as economic disadvantage, “the nature of social interaction” can be understood as population density and racial/ethnic heterogeneity, and “the operation of institutional systems” can be understood as informal social control or collective efficacy. SDT explains how the preceding discussion provides a general overview of how social context trickles down to affect individual behaviors, but the following section will examine in detail how each individual risk factor is tied to social structures, or, in this case, the disorganization of social structures (via SDT).
Antisocial Behavior

According to Andrews and Bonta (2010), antisocial behavior includes a history of engagement in antisocial activities such as being arrested or violating probation or other supervisory conditions. The predictive strength of antisocial behavior as a risk factor is strengthened by the younger the youth was at the time of initial engagement in delinquency, the higher the number of offenses, and the higher the variety in the types of offenses (Andrews & Bonta, 2010). Social disorganization impacts the likelihood of a youth behaving antisocially because in communities that experience high levels of economic disadvantage, resources such as jobs, education, healthcare, and prosocial recreation are scarce or not easily accessible for many residents. The competition for available resources becomes an impingement on the ability of adult residents to collectively supervise youths by requiring adults to dedicate time and energy on obtaining the resources necessary for survival, which detracts from, or even trumps, using time and energy to collectively supervise youths.

Macro-level collective supervision affects youths at the individual level because youths, left unsupervised, are more likely to engage in antisocial behavior (Osgood & Anderson, 2004). For example, rational choice theory states that individuals weigh the costs and benefits of their actions and, if the benefits outweigh the costs, will commit the action (Clarke & Cornish, 2001). If a youth is unsupervised, the likelihood of being caught while participating in antisocial behavior (a cost) is decreased, and the benefit of the behavior, whatever it may be, is increased. Thus, an unsupervised youth is more likely to engage in antisocial behavior than is a supervised youth. Because economic disadvantage varies across urban and rural communities (ERS, 2019c), one could expect to also see variation in the level of collective supervision of youths across urban and rural communities (Bouffard & Muftic, 2006; Nelson et al., 2010), and in turn, variation in the likelihood of youths from those communities engaging in antisocial behavior.
Antisocial Personality Pattern

According to Andrews and Bonta (2010), antisocial personality pattern (APP) includes weak self-control, weak anger management skills, poor problem-solving skills, pleasure-seeking, aggression, general troublemaking with multiple people in multiple settings, and a callous disregard for others (Andrews & Bonta, 2010). Few interventions have been found to be effective for preventing the development of APP (Scott et al., 2014). However, of the interventions that have been found to be effective, the involvement of the youth’s family members in the actual therapy sessions and long-term aftercare of the youth is required (Kazdin et al., 2018; Scott et al., 2014; Uliaszek et al., 2013).

Social disorganization impacts the likelihood of a youth’s parents’ and other family members’ attendance and participation in therapy sessions because in communities that experience high levels of economic disadvantage, jobs are scarce or not easily accessible for many residents. Parents may have to travel long distances to work, which cuts down on the amount of time they have available to spend with their children, including time that parents could devote to attending family therapy sessions that benefit the child. Moreover, long work commutes could interfere with the efficacy of recommended therapy treatments for the youth which include protocols that must be carried out in the home (e.g., weekly homework assignments for parents to help parents learn to be “skills coaches” for the youth, meditation, treatment for the parents’ own mental health disorders, if any) (Uliaszek et al., 2013).

Some treatment programs go so far as to refuse treatment to youths whose parents miss therapy sessions (Uliaszek et al., 2013). The implications of this policy could be detrimental to the youth and community for several reasons. First, youths might be denied treatment that could help alleviate APP, leaving the youths to turn to unhealthy coping mechanisms, such as substance abuse or other forms of delinquent behavior. Second, parents and other members of the
family might be denied treatment that could help them cope with the youth’s APP, potentially weakening the warmth and attachment between family members (Uliaszek et al., 2013). Third, parents might feel compelled to give up their remote jobs in order to spend more time with their children, thus compromising the family’s financial wellbeing. All these possibilities impact a community that is already experiencing social disorganization by burdening a fragile system of informal social control with more delinquency, more family problems, and more economic hardship.

According to Uliaszek et al. (2013) building close, warm relationships with parents is an essential dynamic in ameliorating APP, yet the obstacles parents in low SES areas face may prevent these close relationships from forming. Murali and Oyebode (2004) noted that poverty imposes stressors on parents (e.g., lack of satisfying employment, social isolation, lack of community resources) that increase harsh parenting practices and inhibit parents’ emotional availability to meet youths’ needs. Furthermore, Caspi et al. (2000) found that parents in low SES neighborhoods have increased stress, reduced access to community supports necessary for child rearing, and fewer community services for promoting their children’s well-being and development. Because SES varies across urban and rural communities (Cook-Craig et al., 2010; Dudgeon & Evanson, 2014; Perkins et al., 2002), one could expect to also see variation in the ability of parents to participate in treatment for youths suffering from antisocial personality pattern.

**Antisocial Attitudes**

According to Andrews and Bonta (2010), antisocial attitudes include values, beliefs, rationalizations, and a personal identity favorable to crime. These attitudes manifest in a youth feeling anger, resentment, and defiance towards authority, personal identification as a delinquent,
a value that sees delinquency as rewarding, and a set of rationalizations for why delinquency is acceptable (Andrews & Bonta, 2010). The level of social disorganization in an area impacts youths living in that area because economically-disadvantaged communities tend to have shortages of resources such as jobs, education, healthcare, and prosocial recreation. In their quest to acquire scarce resources, youths might develop a competitive rather than a cooperative attitude towards other members of the community. If a youth is consistently able to obtain resources through competing, rather than cooperating, with others, then one of the key components of collective efficacy would be compromised. The compromised component would be residents who know and trust each other. In communities with high levels of social disorganization, collective efficacy is already weak, and resources are scarce. Thus, limited resources coupled with weak informal social controls (e.g., familiarity and trust among residents, willingness of adults to supervise neighborhood youths) facilitate a youth’s motivation and ability to obtain resources that he or she wants or needs through antisocial means such as stealing, fighting, or self-isolating from peers who become rivals rather than friends. After experiencing repeated success in obtaining resources through deviant means, the youth’s antisocial behavior would be internalized and solidify into antisocial attitudes (Rand et al., 2014).

**Antisocial Peers**

Andrews and Bonta (2010) define antisocial peers as criminal individuals who have close and frequent association with each other. At the most basic level, population density affects the number of peers a youth will likely associate with. Sparsely populated or geographically spread-out populations will also likely reduce the number of peers with whom a youth comes into contact. Racial/ethnic heterogeneity could create cultural or language barriers, preventing youths from forming peer associations. Social distance created by social stratification in which social
norms and values are created to maintain the status quo, can impact the formation of peer associations. On the one hand, youths might be less likely to form peer associations because they are not in the same social strata as the youths surrounding them. On the other hand, youths might be more likely to form peer associations because the majority of youths surrounding them are of the same social strata. If the social strata shared by the youths is one that is seen as antisocial or delinquent by other members of society, then the youths within that strata might find antisocial peers with which to associate.

Communities with low SES tend to have scarce resources, fostering a competitive environment in which youths could do one of two things: isolate themselves from peers because they view them as rivals in the quest for resources, or, align themselves with peers who will aid them in obtaining resources. The quest may come in the form of using legitimate means with the help of prosocial peers, or, if few or no legitimate avenues to obtaining resources exist, using illegitimate means with the help of antisocial peers. Another influence that the low SES of a community has on a youth’s association with antisocial peers is the weakened ability of local adults to provide collective supervision of youths. Adults in low SES communities are likely to be spending a good portion of their days working, commuting to work, preparing for work, or looking for work. The hours spent on work or work-related activities decrease the hours spent supervising the community’s youths. This could result in less stringent monitoring of youths, giving the youths more opportunities to meet and form associations with antisocial peers. The same argument of weakened collective supervision can be made in relation to communities with high levels of residential instability. Due to the transient nature of the community’s residents, people might not try to get to know each other. This would inhibit their ability to identify antisocial youths, much less antisocial peer associations among the youths.
Because population density, geography, levels of racial/ethnic heterogeneity, SES, and residential instability vary across urban and rural communities (Chamberlain & Hipp, 2015; Cook-Craig et al., 2010; Dudgeon & Evanson, 2014; Nelson et al., 2010; Perkins et al., 2002; U.S. Census Bureau, 2015), one could expect to also see variations in the likelihood of youths from those communities to develop antisocial peer associations. On the one hand, for example, urban areas, which are more densely populated than rural areas, offer more opportunities for youths to interact, which could increase the likelihood of youths meeting and associating with antisocial youths. On the other hand, rural areas tend to be geographically isolated, so parents could have long commutes to work, which would hinder their supervision of their children. This reduced supervision could allow youths more leeway to form associations with antisocial peers.

**Family Problems**

According to Andrews and Bonta (2010), family problems include the quality of the relationship between youths and their parents. The two key relationship components that are associated with the risk of a youth engaging in delinquency are the warmth/nurturance of the parents and the parent’s ability to monitor the youth. Problems arise when youths experience conflict with family members, lack positive relationships with family members, and do not receive adequate monitoring/supervision from parents (Andrews & Bonta, 2010). Social disorganization affects family relationships in several ways. Communities with low SES have few neighborhood job opportunities and scarce resources (Dudgeon & Evanson, 2014). Parents in low SES communities are likely to be spending a good portion of their days working, commuting to work, preparing for work, or looking for work (Osgood & Chambers, 2003). The hours spent on work or work-related activities decrease the hours that parents spend supervising their youths. This could result in less stringent monitoring of youths. The hours that parents
spend on work and work-related activities can also undercut the opportunities for parents to show warmth and nurturance to their children. The lack of neighborhood jobs could affect the hours that youths spend away from their parents and other family members.

**School Problems**

According to Andrews and Bonta (2010), school problems include the interpersonal relationships that form within school. The key components of these relationships that are associated with delinquent behavior are school performance, involvement of the youth in school and school activities, and attachments to fellow students and authority figures (Andrews & Bonta, 2010). Social disorganization affects a youth’s school performance and involvement, as well as his or her attachments to fellow students and authority figures, in several ways.

Communities with smaller populations of youths will have smaller student bodies. This means that the teacher-to-student ratio is usually lower, so communication and controls are more personal and based on quality, rather than quantity (McIntire et al., 1990). In this setting, youths would be more likely to form stronger attachments with the other students and with the teachers and other authority figures. Additionally, poor attendance and performance could be more easily identified and improved in less populated schools (Lipsey & Derzon, 1998).

In communities with high levels of racial/ethnic heterogeneity, youths might experience lower levels of performance due to cultural and language barriers between students and/or teachers and other authority figures. For the same reason, youths might not be as likely to form strong attachments to other students and authority figures within the school, or to become highly involved in school activities. In a similar manner, high levels of residential instability might result in youths failing to perform well, become involved, or form attachments in school because either they or the teachers are transient. The collective efficacy of the school population would
be weakened, impacting individual youths’ desire or ability to fully experience the mediating effect that strong bonds of involvement, commitment, and attachment to school can provide (Hirschi, 1969).

Finally, communities with low SES have fewer resources, including neighborhood job opportunities, for youths. Some youths might need to drop out of school in order to work. Because population size and density, SES, racial/ethnic heterogeneity, and residential instability vary across urban and rural communities (Chamberlain & Hipp, 2015; Cook-Craig et al., 2010; Dudgeon & Evanson, 2014; Nelson et al., 2010; Perkins et al., 2002; U.S. Census Bureau, 2015), one could expect to also see variations in the likelihood of youths from those communities to have school problems.

Antisocial Leisure Activities

According to Andrews and Bonta (2010), leisure includes the level of involvement and satisfaction youths gain from prosocial leisure activities (Andrews & Bonta, 2010). Social disorganization affects youths’ leisure activities in several ways. In low SES communities, resources are scarce, including those that needed for prosocial recreational activities (Dahmann et al., 2010; McKenzie et al., 2013; Moore et al., 2008). Youths must compete for access to the activities that are available. Youths who cannot gain access to prosocial leisure pursuits tend to engage in antisocial leisure pursuits (Caldwell & Smith, 2006; Spaeth et al., 2015).

Low SES, residential instability, and racial/ethnic heterogeneity weaken collective efficacy. Part of collective efficacy is residents’ willingness to form friendships and engage in voluntary community organizations. Without community support stemming from residents’ willingness to advocate for or participate in providing recreational programs or centers, opportunities for youths to find prosocial leisure activities are decreased. Also, weakened
collective efficacy leads to reduced collective supervision of youths, so youths have more leeway in which to engage in antisocial leisure activities. Because SES, racial/ethnic heterogeneity, and residential instability vary across urban and rural communities (Chamberlain & Hipp, 2015; Cook-Craig et al., 2010; Dudgeon & Evanson, 2014; Nelson et al., 2010; Perkins et al., 2002), one could expect to also see variations in the likelihood of youths from those communities to engage in antisocial leisure activities.

**Substance Abuse**

According to Andrews and Bonta (2010), current substance abuse problems are a stronger predictor of delinquency than are past substance abuse problems. Social disorganization of communities impacts the likelihood of youths to have substance abuse problems in several ways. First, if a community has low levels of collective efficacy, due to competition for resources, racial/ethnic heterogeneity, or residential instability, adults will likely be unable or unwilling to collectively supervise the youths of the community, allowing the youths more opportunities to use and abuse substances. Second, communities that lack collective efficacy will have fewer adults monitoring youths’ peer associations. Third, according to Lee et al. (2004), youths who associate with substance using peers tend to use substances themselves.

Fourth, youths in communities with low SES might experience strain as a result of negative relationships with people who somehow prevent the youth from reaching his or her goals. The other person or people in the negative relationship might take away something that the youth values or add something “noxious” to the youth’s life. The youth is unable to find a way out of the relationship, so they feel strain. For example, the other person in the negative relationship might be a member of the youth’s household who, because the youth is not old enough to leave home, continues to be a part of the youth’s everyday life (Agnew, 1992). To deal
with the strain the youth feels, he or she might turn to substance abuse if they lack prosocial ways of coping with the strain of the negative relationship. Because SES, racial/ethnic heterogeneity, and residential instability vary across urban and rural communities (Chamberlain & Hipp, 2015; Cook-Craig et al., 2010; Dudgeon & Evanson, 2014; Nelson et al., 2010; Perkins et al., 2002; U.S. Census Bureau, 2015), one could expect to also see variations in the likelihood of youths from those communities to have substance abuse problems.

Summary

The disorganization of social structures at the macro-level (i.e., low SES, racial/ethnic heterogeneity, and residential instability) leads to weakened informal social control at the community level, indicated by low levels of collective efficacy (e.g., collective supervision of youths, trust, communication, and support among residents) (Bursik & Grasmick, 1993; Sampson et al., 1997). Social disorganization varies across urban and rural communities (Chamberlain & Hipp, 2015; Cook-Craig et al., 2010; Dudgeon & Evanson, 2014; Nelson et al., 2010; Perkins et al., 2002; U.S. Census Bureau, 2015), and impacts individual risk factors through a variety of ways that one could expect to differ across community type. Residents of rural areas tend to have more close-knit communities and higher levels of trust and reliance on each other than do residents of urban areas (Judd et al., 2006; Larson & Corrigan, 2010; Stewart et al., 2016). Rural areas also have smaller populations than urban areas (U.S. Census Bureau, 2015). They are also less likely to have rapid shifts in population than are urban areas (Bouffard & Muftic, 2006). Lastly, rural areas tend to be more racially/ethnically homogenous than are urban communities (Nelson et al., 2010). The final step in building a theoretical framework is a bridge to connect community-level variables to variations in the predictive ability of a juvenile risk assessment instrument, namely the PACT, across urban and rural communities.
Social Disorganization and the Predictive Validity of the PACT

The preceding section discussed how the level and types of risk factors for delinquency are affected by social disorganization. This section will discuss how the predictive validity of the PACT is affected by social disorganization. SDT suggests that community characteristics (e.g., SES, racial/ethnic heterogeneity, residential instability) influence informal social control (also known as collective efficacy), which, in turn, affects delinquency rates. Based on existing evidence that suggests that social disorganization impacts individual-level risk factors for delinquency differently across community type (Chamberlain & Hipp, 2015; Cook-Craig et al., 2010; Dudgeon & Evanson, 2014; Nelson et al., 2010; Perkins et al., 2002), it is expected that the predictive validity of a single risk assessment instrument (i.e., the PACT) will vary across communities as well. Use of a single, generic risk assessment instrument is likely inadequate to capture differences in urban and rural youths and accurately categorize these youths into risk levels. Instead, it is expected that the predictive validity of the PACT will be stronger in urban areas because most of the research upon which the PACT is based was done in urban areas.

Using a single risk assessment instrument across urban and rural communities might not take into account individual differences of youths placed into similar risk categories. For example, depending on where youths live, their attitudes and behaviors are impacted in ways that differ across community type, and could affect their willingness or ability to respond accurately to PACT questions. U.S. Census Bureau (2016) data show that youths living in urban areas are also more likely to live in poverty than youths from rural areas. Youths who come from low SES neighborhoods might not have had access to quality education. Their understanding of vocabulary or concepts used in the PACT could be limited, leading to inaccurate responses. Youths who have language acquisition impairments may have limited vocabularies, inability to
ask questions relevant to the topic at hand, and difficulty with verbal expression (Blanton & Dagenais, 2007).

Due to language or cultural differences, concepts used in the PACT may not be interpreted, in the way the PACT creators intended, consistently across youths, caregivers, or personnel administering the PACT. For example, the concept of family might vary depending on the community in which a youth lives. In some communities, the person or persons filling the role of a parent might not be a relative or household member of the youth. It could be a mentor such as a coach, a pastor, a friend’s parent, or a teacher. Perhaps in some ethnic groups, a communal parenting technique is practiced, wherein youths receive the protective factors of family (e.g., warmth, supervision, involvement) from people outside of their household and biological kin. The PACT questions measuring family risk factors are mainly about relatives and household members, so even if a youth is receiving effective parenting from someone outside of the family or household, the youth might still be scored as high risk for family problems. Because urban communities tend to have higher levels of racial/ethnic heterogeneity (Nelson et al., 2010), youths from urban areas have a higher likelihood of defining or conceptualizing “family” in ways different from the PACT definition. Thus, urban youths could be at a higher risk of being scored inaccurately in the PACT’s family risk domain.

Variations in risk assessment instruments’ predictive abilities across different conditions and characteristics could be due to “omitted variable bias.” This type of bias occurs when one or more variables related to one or more types of offender or offenses are omitted or underrepresented in a risk assessment instrument (Schwalbe et al., 2006). Thus, the ability of the instrument to account for all the factors related to juveniles’ risk to reoffend is weakened. Because most youthful offenders live in urban areas (U.S. Census Bureau, 2018), most studies on
juvenile delinquency and juvenile risk factors are based on samples comprised of a large majority of urban youth. Since juvenile risk assessment instruments are based on the findings from these studies on urban youths, it is likely that the instruments have also been validated mainly using samples of urban, rather than rural, youths (Bouffard & Muftic, 2006; Kaylen & Pridemore, 2013). Thus, there may be omitted variable bias for rural youths. Moreover, if risk factors for delinquency vary across urban and rural communities, and juvenile risk assessment instruments were designed based on risk factors more prevalent in urban than in rural areas, then the risk scores generated by those instruments may be less accurate for rural youths than for urban youths. Therefore, it is reasonable to expect that the predictive validity of the PACT will be stronger for urban rather than rural youths.

Another reason why the PACT’s predictive validity could vary across urban and rural areas is the way in which social disorganization impacts collective efficacy and, in turn, the way in which collective efficacy impacts reporting patterns of delinquency. In neighborhoods with high levels of social disorganization, the ability of residents to provide informal social control is weakened (Bursik & Gramsick, 1993; Sampson et al., 1997). Youths from neighborhoods with weak informal social controls might be more likely to engage in antisocial behavior without being caught and subsequently referred to the juvenile justice system. As a result, youths could be given a PACT score that does not reflect the true measure of past antisocial behavior, but only a measure of how often the youth was caught engaging in antisocial behavior. The official juvenile justice records of these youths might not reflect the true measure of past antisocial behavior, but only a measure of how often the youth was formally referred to the juvenile justice system for engaging in antisocial behavior.
The discrepancy between actual antisocial behavior and referrals to the juvenile justice system could also result in inaccurate risk prediction of the PACT. A discrepancy could occur due to incidents of antisocial behavior being handled outside of the juvenile justice system, especially in rural areas where youths tend to have closer ties to people outside of the justice system who provide guidance and discipline, such as extended family members (Brody & Flor, 1998) and schoolteachers and administrators (McIntire et al., 1990). The implications of this discrepancy are the possibility of false positives, in which youths are categorized as likely to reoffend but they do not, and/or false negatives, in which youths are categorized as not likely to reoffend but they do reoffend. The problem with false positives is youths might be subjected to higher than necessary levels of supervision or treatment, whereas the problem with false negatives is that the youths might continue to harm the community or themselves. Because the majority of research on juvenile delinquency is based on urban youths, and risk assessment instruments, including the PACT, are developed based on existing research on risk factors for juvenile offending, one could expect the PACT to have higher predictive validity in urban rather than in rural areas.

Summary

The PACT is a semi-structured interview questionnaire administered by trained screeners to youth participants referred to FDJJ (Early et al., 2012). The design of the PACT relies on practitioner (i.e., PACT screeners) discretion, self-reported data, and official records. Each of these design components could be influenced by social disorganization. A single instrument (like the PACT) might not take into account individual differences of youths across geographic locations that may be placed into similar risk categories. These differences stem from the characteristics of the communities in which youths reside. Youth participants come from both
urban and rural communities. Because social disorganization varies across urban and rural communities (Chamberlain & Hipp, 2015; Cook-Craig et al., 2010; Dudgeon & Evanson, 2014; Nelson et al., 2010; Perkins et al., 2002), one could expect members of urban and rural communities to interpret PACT questions and/or responses in inconsistent or inaccurate ways, or to report delinquency at different rates, thus decreasing the PACT’s predictive validity across urban and rural communities.

Chapter Summary

A theoretical framework that is used to guide the present study consisting of both macro- and micro-level concepts and support from previous studies has been described. Social disorganization theory (SDT) makes up the foundation of the framework. The foundation establishes the underlying premise of the current research that differences in community-level characteristics (based on SDT) exist across urban and rural areas (i.e., varying levels of collective efficacy caused by differences in population size, shifts, composition, and values), and those differences account for expected variations in the level and type of risk factors for delinquency that youths from those areas face. Differences in community-level characteristics also account for expected variations in the PACT’s predictive validity across urban and rural communities. The theoretical framework builds off the foundation of social disorganization to show how community-level variables trickle down through social and political processes, the allocation of scarce resources, social interaction, and the operation of institutional systems, such as family and education, to impact individual risk factors of delinquency. Finally, the theoretical framework shows how the differential impacts of SDT on individual risk factors account for the expected differences in strength of the predictive validity of the PACT. It is hypothesized that the predictive validity will be stronger for urban rather than for rural youths.
CHAPTER 4: METHODS

This study has a two-fold purpose. First, it examines the level and type of risk for juvenile delinquency across urban and rural areas in Florida. Second, it examines the PACT to determine whether its predictive validity differs across urban and rural communities in Florida. This chapter details the methodology for the current study, including research questions and hypotheses, research design, sample selection, data collection, variables, instrumentation, and measurement.

Research Hypotheses

Three specific research questions guide the current study. First, are there differences across level of risk for offenders living in urban and rural communities? Second, are there differences across type of risk for offenders living in urban and rural communities? Third, does the predictive validity of the PACT and time to recidivate vary across offenders living in urban and rural communities? Eleven hypotheses were generated from the research questions, which follow theory and prior research:

- $H_1$: Youths who reside in urban areas are more likely than youths who live in rural areas to be rated at a higher risk level for recidivism.
- $H_2$: Youths who reside in urban areas are more likely than youths who live in rural areas to be rated at a higher risk level for antisocial behavior.
- $H_3$: Youths who reside in rural areas are more likely than youths who live in urban areas to be rated at a higher risk level for mental health problems.
- $H_4$: Youths who reside in urban areas are more likely than youths who live in rural areas to be rated at a higher risk level for having antisocial attitudes.
• **H5:** Youths who reside in urban areas are more likely than youths who live in rural areas to be rated at a higher risk level for having antisocial peers.

• **H6:** Youths who reside in urban areas are more likely than youths who live in rural areas to be rated at a higher risk level for having family problems.

• **H7:** Youths who reside in urban areas are more likely than youths who live in rural areas to be rated at a higher risk level for having problematic school experiences.

• **H8:** Youths who reside in rural areas are more likely than youths who live in urban areas to be rated at a higher risk level for participating in antisocial leisure activities.

• **H9:** Youths who reside in rural areas are more likely than youths who live in urban areas to be rated at a higher risk level for substance abuse.

• **H10:** The PACT is more likely to make valid level of risk predictions for youths who reside in urban areas than for youths who reside in rural areas.

• **H11:** The time to recidivism will be shorter for youths who reside in urban areas than for youths who reside in rural areas.

**Rationale for Developing the Research Hypotheses**

The hypotheses generated for this study were based on prior macro- and micro-level research examining community characteristics across urban and rural areas, risk factors for delinquency among urban and rural samples of adolescents, and the theoretical propositions of SDT. The hypotheses focus on the Central Eight because they are the risk factors found to be the most strongly predictive of delinquent behavior (Andrews & Bonta, 2010). The hypotheses also focus on the type of community (i.e., urban or rural) in which youths reside. SDT states that there are community characteristics that influence the level of informal social control which, in turn, affect delinquency rates (Bursik & Gramsick, 1993; Sampson et al., 1997; Shaw & McKay,
1947). These community characteristics vary across urban and rural areas (Bouffard & Muftic, 2006; Moore & Sween, 2015; Nelson et al., 2010; Osgood & Chambers, 2003; Sampson et al., 1997; Weisheit & Donnermeyer, 2000; Wells & Weisheit, 2004). Thus, the research hypotheses were based on whether the specific dependent variable (i.e., risk factor) under investigation is more likely to occur in urban or rural areas based on prior empirical studies and the theoretical propositions of SDT.

Research Design

The current study utilized a non-experimental design to test the hypotheses. The design was non-experimental for several reasons. First, youths in the sample were grouped according to the type of communities in which they reside (urban or rural). Youths could not be randomly assigned to community type; therefore, a true experimental design was not possible. Second, secondary data was being analyzed, so neither the IV (community type) nor the DV (level and type of risk, recidivism) could be manipulated. Third, the study did not include an experimental or control group. Furthermore, the analyses utilized a retrospective research design. The data that was used for the current study was administrative data collected by the FDJJ and included all youths who were released from probation between January 1, 2013 and December 31, 2017. Data on the youths’ demographic information, risk level, offending, and recidivism were drawn from FDJJ’s archival central data records and PACT scores. The PACT scores from the assessment given closest to the youth’s referral date were used. Youths sanctioned to probation in 2013 whose initial PACT assessments were done in 2012 were not included in the sample. These parameters were selected to ensure a sufficiently large sample size to draw meaningful conclusions. Also, the selected years accommodate the 12-month recidivism follow-up period that was used as a dependent variable.
Population and Sample

Florida has one of the largest state-centralized juvenile justice systems in the U.S. (Baglivio & Jackowski, 2013). In the state of Florida, every youth under the age of 18 years who is charged with committing a delinquent act is referred to the Florida Department of Juvenile Justice (FDJJ) and is given the PACT Pre-Screen Assessment. Youths who score moderate-high or high risk to recidivate on the Pre-Screen are reassessed using the PACT Full Assessment. The youths are reassessed with the Full Assessment every 90 days for the duration of their FDJJ supervision or until they score low or moderate risk (at which point they are reassessed every 180 days with the Pre-Screen) (Baglivio & Jackowski, 2013). PACT data are collected through a semi-structured, motivational interview. The PACT is administered by an FDJJ staff member who has had at least two days of training on risk assessment theory, case planning, and techniques of motivational interviewing (Barnoski, 2019). An evaluation of the PACT’s inter-rater reliability, using a sample of randomly selected PACT administrators at FDJJ, found varying levels of agreement (52%-100%) across scoring of the social history sections. Inter-rater reliability was higher when a male offender was being scored than when a female offender was (Early et al., 2012). Also, factor analyses showed that the questions used to compute the criminal history score had high internal consistency (alpha = 0.71), and the questions used to compute the social history score had medium internal consistency (alpha = 0.54) (Early et al., 2012). Based in part on PACT scores, FDJJ makes recommendations to the State Attorney and Juvenile Court regarding appropriate sanctions for the youths. FDJJ utilizes several sanctions, including diversion programs, probation, detention, and transfer to adult court. FDJJ has three types of probation: intake, supervision, and transition/reentry (FDJJ, 2012a). For the current study, only youths sanctioned to probation-supervision were included in the sample, and probation-supervision will hereafter be referred to as probation.
The initial sample, drawn from FDJJ archival data records, consisted of 10,416 unique youths referred to FDJJ who (1) scored moderate-high or high risk to reoffend on their initial PACT Pre-Screen assessment, (2) were subsequently administered the PACT Full Assessment (youths whose initial PACT assessments were done in prior to 2013 were not included in the sample), (3) were sanctioned to probation, and (4) were released from probation between January 1, 2013 and December 31, 2017. To eliminate outliers that could impact the outcome variable (recidivism), youths who were on probation longer than three years \( (n = 114, 1.09\%) \) were removed from the sample. In the race/ethnicity category, youths categorized as “Other” were removed from the sample because these youths \( (n = 73) \) represented a very low percentage \( (>0.01\%) \) of the entire sample. The final sample consisted of 10,229 youths. For this study, recidivism was defined as any new adjudications, adjudications withheld, or convictions for any violation of law during the time that a youth is on probation or, if the youth completed probation without recidivating, during the 12-month period after a probation was completed. Thus, the longer a youth was on probation, the longer they had to recidivate. In the race/ethnicity category, youths categorized as “Other” were removed from the sample because these youths \( (n = 73) \) represented a very low percentage \( (>0.01\%) \) of the entire sample. The final sample consisted of 10,229 youths.

The individual-level unit of analysis was youths referred to FDJJ who meet the above criteria. Using youths as the individual-level unit of analysis has been a common practice in studies examining variations in risk factors across urban and rural communities and in juvenile risk assessment validation studies using archival administrative data (Baglivio & Jackowski, 2013; Campbell et al., 2019; Gillen et al., 2019; Onifade et al., 2009). For example, when validating the Ohio Youth Assessment System Dispositional Tool (OYAS-DIS), Campbell et al.
(2019) used a sample of youths who were referred to juvenile court between 2010 and 2016. For cases where a youth was referred more than once during the study period, only records from his or her first contact with the court were included in the data set.

It is important to note that the unit of analysis was youths rather than arrests or dispositions. Each row of the current study’s dataset was an individual youth, not a referral or charge. FDJJ annually reports number of arrests in a separate report from number of youths arrested. If a youth was adjudicated and placed on probation more than once in a year, or for more than one offense per disposition, only the first offense adjudicated was counted for that year. For example, from 2013-2017, 288,239 arrests were reported, but only 160,299 youths arrested were reported (FDJJ, 2018). The reason for using individual youths as the unit of analysis, rather than referrals, was to utilize a sample that is not saturated by a small number of chronic offenders. Thus, if a youth was adjudicated and placed on probation more than once during the study years, only the records from the first probation placement were included in the dataset.

There are two main reasons for limiting the sample to youths who were sanctioned to probation. First, one of the goals of the current study is to examine whether the PACT accurately predicts recidivism, and youths who are out in the community, rather than in a detention facility, are faced with more opportunities to reoffend. Second, probation was the second most commonly used sanction during the study time frame. Thirty-one percent (n=50,036) of all referrals resulted in probation (FDJJ, 2018). Diversion was the most common outcome from referrals, with 42% (n=66,852) of all referrals resulting in diversion (FDJJ, 2018). Diversion was not used as a criterion for inclusion in the sample because, by definition, youths sanctioned to diversion are diverted outside of the formal juvenile justice system. In addition, diverted youths are more
likely to be low to moderate-risk offenders who would have been given only the PACT Pre-Screen Assessment.

Data Collection

The current study utilized secondary data from FDJJ records, PACT data, and the U.S. Census Bureau. FDJJ’s archived central data records contain information on youths’ zip codes, demographics, date of referral, offense type, and recidivism. The Census data contain information which was used to categorize communities as urban or rural. Data collected from PACT scores came from the youths’ initial Full Screen PACT. The initial PACT scores reflect the level and types of risks in a youth’s life at the time closest to his or her delinquent behavior, but before he or she has been exposed to any sanctions, supervision, or treatment. The final time a youth is given the PACT is right before he or she is released from FDJJ supervision. This is called the “exit PACT”. Using the exit PACT scores would be useful for examining if and how specific sanctions effect a change in PACT scores over the time a youth is in FDJJ custody, but that is outside the scope of the current study.

To determine if a youth resided in an urban or rural community, the current study used zip codes as the geographical unit of analysis rather than census tracts or counties. Zip codes were useful for several reasons. First, the region being studied has several large counties that incorporate both urban and rural areas. Using larger geographic units, such as counties, could potentially obscure significant variations in characteristics of urban and rural areas that impact risk factors. Second, using smaller geographic units, such as census tracts, could undermine the anonymity of youths in the sample, and could also result in an unwieldy, impractical number of geo-indicators; there are about two times more census tracts than zip codes, and about 23 times more census tracts than counties (U.S. Census Bureau, 2015; USPS, 2016). Third, data were not
available to show whether youths moved during the 12-month post-release follow-up period. Thus, it was reasonable to assume that even if youths did move, they stayed in the same zip code area rather than in the same, much smaller, census tract (Baglivio et al., 2015).

Variables

The variables used in the current study were based on the literature review and theoretical framework. For $H_1$, the independent variable (IV) is the community type in which the youth resides (urban or rural), and the dependent variable (DV) is risk level for recidivism. For $H_2$ through $H_9$, the IV is community type and the DVs are the various risk factors corresponding to each hypothesis. For $H_{10}$, the IV is risk level and the DV is recidivism and these analyses will be disaggregated across community type. For $H_{11}$, the IV is community type and the DV is time to recidivism. A more detailed discussion regarding measurement of variables follows.

Dependent Variables for $H_1$ through $H_9$

The PACT consists of 126 items, divided into 12 risk domains. Each domain generates a sub-score. The sub-scores are used to produce an overall risk to re-offend classification (low, moderate, moderate-high, high). Sub-scores are also used to determine a social history score and criminal history score. The social history score reflects the level of individual, family, and social risk factors, whereas the criminal history score reflects the extent and seriousness of prior offending. The risk domains are based on Andrews and Bonta’s (2003) “Central Eight” risk factors (Baglivio & Jackowski, 2013). For $H_1$ through $H_9$, the DVs (level of risk for recidivism, antisocial behavior, mental health, antisocial attitudes, antisocial peers, family problems, school problems, substance abuse, use of leisure time) were measured by PACT risk domain sub-scores. Three PACT domains were not used as variables in this study: Employment, Aggression, and Skills. Employment and skills were excluded because they are not part of the Central Eight risk
factors. Aggression was excluded because it, by itself, is not one of the Central Eight, but attitudes and behaviors reflecting aggression are accounted for in the “Attitudes/Behavior” and “Record of Referrals” domains. Scores from the corresponding PACT domains were used to represent the types of risk factors currently present in the youth’s life (see Table 1).

Table 1: PACT Domains

<table>
<thead>
<tr>
<th>Domain</th>
<th>Domain Items</th>
</tr>
</thead>
</table>
| 1: Record of Referrals (H₂)   | 1. Age at first offense  
2. Misdemeanor referrals  
3. Felony referrals  
4. Weapon referrals  
5. Against-person misdemeanor referrals  
6. Against-person felony referrals  
7. Sexual misconduct misdemeanor referrals  
8. Felony sex offense referrals  
9. Confinements in secure detention  
10. Commitment orders  
11. Escapes  
12. Pick up orders for failure-to-appear in court or absconding supervision |
| 2: Gender                     | 1. Male  
2. Female |
| 3B: Current School Status (H₃) | 1. Current school enrollment status  
2. Type and name of school in which youth is enrolled  
3. Youth believes there is value in getting an education  
4. Youth believes school provides an encouraging environment for him or her  
5. Names of teachers, staff, or coaches the youth likes or feels comfortable talking with  
6. Youth’s involvement in school activities during most recent term  
7. Youth’s conduct in most recent term  
8. Number of incidents of expulsions and suspensions in most recent term  
9. Youth’s attendance in most recent term  
10. Youth’s academic performance in most recent term |
<table>
<thead>
<tr>
<th>Domain</th>
<th>Domain Items</th>
</tr>
</thead>
</table>
| 4B: Current Use of Free Time (H<sub>6</sub>) | 1. Current interest and involvement in structured recreational activities  
2. Types of structured recreational activities in which youth currently participates  
3. Current interest and involvement in prosocial unstructured recreational activities |
| 5B: Current Employment<sup>b</sup> | 1. Understanding of what is required to maintain a job  
2. Current interest in employment  
3. Current employment status  
4. Current positive personal relationship(s) with employee(s) or adult coworker(s) |
| 6B: Current Relationships (H<sub>5</sub>) | 1. Current positive adult non-family relationships not connected to school or employment  
2. Current prosocial community ties  
3. Current friends/companions youth actually spends time with  
4. Currently in a “romantic,” intimate, or sexual relationship  
5. Currently admires/emulates antisocial peers  
6. Current resistance to antisocial peer influence |
| 7B: Current Living Arrangements (H<sub>6</sub>) | 1. All persons with whom youth is currently living  
2. Annual combined income of youth and family  
3. Jail/imprisonment history of persons who are currently involved with the household  
4. Problem history of parents who are currently involved with the household  
5. Problem history of siblings who are currently involved with the household  
6. Support network for family  
7. Family willingness to help support youth  
8. Family provides opportunities for youth to participate in family activities and decisions affecting the youth  
9. Youth has run away or been kicked out of home  
10. Family members youth feels close to or has good relationship with  
11. Level of conflict between parents, between youth and parents, among siblings  
12. Parental supervision  
13. Parental authority and control  
14. Consistent appropriate punishment for bad behavior  
15. Consistent appropriate rewards for good behavior  
16. Parental characterization of youth’s antisocial behavior |
<table>
<thead>
<tr>
<th>Domain</th>
<th>Domain Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>8B: Current Alcohol and Drugs (H₈)</td>
<td>1. Youth’s alcohol use</td>
</tr>
<tr>
<td></td>
<td>2. Youth’s drug use</td>
</tr>
<tr>
<td></td>
<td>3. Types of drugs used</td>
</tr>
<tr>
<td></td>
<td>4. Current drug/alcohol treatment program participation</td>
</tr>
<tr>
<td>9B: Current Mental Health (H₉)</td>
<td>1. Current suicidal ideation</td>
</tr>
<tr>
<td></td>
<td>2. Currently diagnosed with ADD/ADHD</td>
</tr>
<tr>
<td></td>
<td>3. Mental health treatment currently prescribed excluding ADD/ADHD treatment</td>
</tr>
<tr>
<td></td>
<td>4. Mental health medication currently prescribed excluding ADD/ADHD treatment</td>
</tr>
<tr>
<td></td>
<td>5. Mental health problems currently interfere in working with the youth</td>
</tr>
<tr>
<td>10: Attitudes/Behaviors (H₁₀)</td>
<td>1. Primary emotion when committing crimes</td>
</tr>
<tr>
<td></td>
<td>2. Primary purpose for committing crimes within the last 6 months</td>
</tr>
<tr>
<td></td>
<td>3. Optimism</td>
</tr>
<tr>
<td></td>
<td>4. Impulsive; acts before thinking</td>
</tr>
<tr>
<td></td>
<td>5. Belief in control over antisocial behavior</td>
</tr>
<tr>
<td></td>
<td>6. Empathy, remorse, sympathy, or feelings for the victims of criminal behavior</td>
</tr>
<tr>
<td></td>
<td>7. Respect for property of others</td>
</tr>
<tr>
<td></td>
<td>8. Respect for authority figures</td>
</tr>
<tr>
<td></td>
<td>9. Attitude toward responsible law-abiding behavior</td>
</tr>
<tr>
<td></td>
<td>10. Accepts responsibility for antisocial behavior</td>
</tr>
<tr>
<td></td>
<td>11. Youth’s belief in successfully meeting conditions of court supervision</td>
</tr>
<tr>
<td>11: Aggression (H₁¹)</td>
<td>1. Tolerance for frustration</td>
</tr>
<tr>
<td></td>
<td>2. Hostile interpretation of actions and intentions of others in a common nonconfrontational setting</td>
</tr>
<tr>
<td></td>
<td>3. Belief in yelling and verbal aggression to resolve a disagreement or conflict</td>
</tr>
<tr>
<td></td>
<td>4. Reports/evidence of violence not included in criminal history</td>
</tr>
<tr>
<td></td>
<td>5. Reports of problems with sexual aggression not included in criminal history</td>
</tr>
<tr>
<td>12: Skills (H₁²)</td>
<td>1. Consequential thinking</td>
</tr>
<tr>
<td></td>
<td>2. Goal setting</td>
</tr>
<tr>
<td></td>
<td>3. Problem-solving</td>
</tr>
<tr>
<td></td>
<td>4. Situational perception</td>
</tr>
<tr>
<td></td>
<td>5. Dealing with others</td>
</tr>
</tbody>
</table>
Level of Risk for Recidivism ($H_1$)

This variable is categorical and was operationalized as low, moderate, moderate-high, or high risk to reoffend, as determined by overall PACT scores. The overall PACT score is based on a scoring matrix using the sub-scores of the 12 PACT domains which consist of 126 items total. The higher the score, the higher the number of criminogenic needs and risk factors in the youth’s life. Table 2 outlines the PACT scoring matrix (Baglivio, 2009).

Table 2: PACT Scoring Matrix

<table>
<thead>
<tr>
<th>Criminal History</th>
<th>Social History</th>
<th>6-9</th>
<th>10-18</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-5</td>
<td>Low</td>
<td>Low</td>
<td>Moderate</td>
</tr>
<tr>
<td>6-8</td>
<td>Low</td>
<td>Moderate</td>
<td>Moderate-High</td>
</tr>
<tr>
<td>9-11</td>
<td>Moderate</td>
<td>Moderate-High</td>
<td>High</td>
</tr>
<tr>
<td>12-31</td>
<td>Moderate-High</td>
<td>High</td>
<td>High</td>
</tr>
</tbody>
</table>

Note: All PACT scores are automatically calculated.
**Antisocial Behavior (H2)**

This variable is continuous and was operationalized as the score of PACT Domain 1-Record of Referrals. Domain 1 includes 12 items about the youth’s age at first offense and past and current referrals to FDJJ. Referral type was determined through items that specify whether the offenses were misdemeanors or felonies, against persons or weapon referrals, or sex offenses. Other items address past stays in detention facilities or residential commitments, actual or attempted escapes from such confinement, and pick-up orders for failure-to-appear in court.

**Mental Health (H3)**

This variable is continuous and was operationalized as the score of PACT Domain 9B-Current Mental Health. Items in the domain include questions about current suicidal ideation, current psychological disorders and learning disorders, current health insurance coverage, and current mental health medications.

**Antisocial Attitudes (H4)**

This variable is continuous and was operationalized as the score of PACT Domain 10-Attitudes/Behaviors. Items in the Attitudes/Behaviors domain include questions about emotionality, optimism, impulsivity, self-control, empathy/sympathy/remorse, prosocial and anti-social attitudes, and the youth’s belief in his or her ability to successfully complete FDJJ supervision.

**Antisocial Peers (H5)**

This variable is continuous and was operationalized as the score of PACT Domain 6B-Current Relationships. Items in the domain include questions about current non-family relationships with prosocial and antisocial adults and youths. Items also include questions about current friends the youth spends time with, current romantic and/or sexual relationships, and
antisocial peers who the youth admires or emulates. Finally, the youth’s current ability to resist antisocial peer influence is assessed.

**Family Problems (H₆)**

This variable is continuous and was operationalized as the score of PACT Domain 7B-Current Living Arrangements. Items in the Current Living Arrangements domain include questions about the socioeconomic status of the youth’s family, criminal/antisocial involvement of the youth’s parents and siblings, and parental involvement, discipline, warmth/attachment, and supervision.

**School Problems (H₇)**

This variable is continuous and was operationalized as the score of PACT Domain 3B-Current School Status. Items in the Current School Status domain include questions about the youth’s current enrollment, perception of the quality of the school, involvement in school activities, and recent disciplinary actions.

**Antisocial Leisure Activities (H₈)**

This variable is continuous and was operationalized as the score of PACT Domain 4B-Current Use of Free Time. Items in this domain include questions about current interest and participation in both structured and unstructured prosocial recreational activities.

**Substance Use (H₉)**

This variable is continuous and was operationalized as the score of PACT Domain 8B-Current Alcohol and Drugs. Items in the domains include questions about current frequency of drug/alcohol use, current types of drugs/alcohol used, and current referral to and participation in drug/alcohol assessment, education, and treatment.
Dependent Variables for $H_{10}$

**Recidivism ($H_{10}$)**

Recidivism was defined as any new adjudications, adjudications withheld, or convictions for any violation of law during the time that a youth was on probation or, if the youth completed probation without recidivating, during the 12-month period after probation was completed. Recidivism data was drawn from FDJJ records. This variable was dichotomized as 0 (*no new adjudication*) or 1 (*1 or more new adjudications*).

Dependent Variables for $H_{11}$

**Time to Recidivism ($H_{11}$)**

Time to recidivism was defined as the number of days from the date the youth was sanctioned to probation to the date of the first new adjudication, adjudication withheld, or conviction for any violation of law during the 12 months after the time that the youth completed probation. Recidivism data was drawn from FDJJ records. If a youth recidivated more than one time during this period, only the first instance of recidivism was counted.

Independent Variables

**Community Type**

This variable was dichotomized as 0 (*urban*) or 1 (*rural*) based on the ACS classification of urban and rural areas. Using Census-based definitions of urban and rural has been a common practice in studies examining variations in delinquency and its related risk factors across urban and rural communities because geographic units can be broken down into groups smaller than counties, such as zip codes (Moore & Sween, 2015; Osgood & Chambers, 2003; Wells & Weisheit, 2004). The Census Bureau defines two types of areas as urban: urbanized areas (UAs) and urban clusters (UCs). Urbanized areas have populations of at least 50,000 and urban clusters...
have populations of 2,500-49,999. Areas outside of UAs and UCs, thus, areas with fewer than 2,500 people, are rural (Ratcliffe et al., 2016; U.S. Census Bureau, 2015). Because the Census definition of urban and rural areas is based on geographic units (UAs and UCs) which do not typically align exactly with zip code boundaries, the ACS provides the number of people that live in UAs and UCs within each zip code, and the number of people in rural areas (U.S. Census Bureau, 2019). For the current study, the sum of the number of people in UAs and the number of people in UCs was divided by the total number of people in the zip code to determine the percentage of the zip code area’s population that is urban. Likewise, the number of people in rural areas was divided by the total number of people in the zip code to determine the percentage of the zip code area’s population that is rural. For example, the Florida zip code 32136, which is in Flagler Beach, FL, has a population of 7,080. Of the total population, 71% (n=5,027) reside in urban areas and 29% (n=2,053) reside in rural areas (U.S. Census Bureau, 2019).

For the current study, if more than 50% of the zip code’s population resided in urban areas, the zip code was defined as urban; if at least 50% reside in rural areas, the zip code was defined as rural. Thus, zip code 32136 was defined as urban in the current study. This cut-off is based on the ACS’s definition of “mostly rural counties” which “have a population that is 50.0-99.9% rural (Ratcliffe et al., 2016, p. 6). Each youth’s zip code was included in the FDJJ administrative data. Then, the ACS was used to find the urban/rural classification of each zip code included in the sample. The 2010 ACS urban/rural classification showed that of the 983 zip codes in Florida, 78% (n=765) were urban and 22% (n=218) were rural (U.S. Census Bureau, 2019). Each youth’s residential zip code was linked to this urban/rural classification measure.
Control Variables (CVs)

The following variables were treated as CVs: gender (Male/Female), age (years), race/ethnicity (White/Black/Hispanic using White as the reference category), and year of referral. Gender is one of the strongest predictors of delinquency, with males under the age of 18 being arrested at a rate of nearly 2.5 times that of females under the age of 18 (FBI, 2015). Age is also a major predictor of delinquent behavior (Hockenberry & Puzzanchera, 2019). The PACT has already been validated across gender and race/ethnicity (Baglivio & Jackowski, 2013) so they were not variables of interest in the current study. It remains unclear as to whether race/ethnicity is correlated to delinquent behavior, but it has been shown to be a significant predictor of whether a youth will be referred to the juvenile justice system (Puzzanchera, 2018). The year of referral was used as a control variable to alleviate the threat of history bias to the internal validity of the current study. History biases are events that are not related to the study, but that occur during the time period in which the study was conducted and that may impact the outcomes of the study (Naci & Soumerai, 2016). For example, the pandemic of 2020 and the ensuing nationwide lockdown could introduce a history bias into juvenile delinquency rates because fewer opportunities for misconduct were available. Because gender, age, race/ethnicity, and year of referral have been shown to be important predictors of delinquent behavior, their influences were controlled in the current study.

Data Analysis

To answer RQ1, which asks whether there are differences in level of risk across juveniles living in urban and rural communities, crosstabulation (crosstab) and chi-square analyses were performed to determine the joint frequency values for the IV (community type) and the DV (risk level). The analyses investigated the bivariate relationship between the variables and evaluated
whether the variables were dependent (related) or independent (unrelated). If the variables were found to be dependent, meaning a statistically significant relationship exists between them, then it was concluded that there was a significant relationship between community type and level of risk for recidivism. The significance level was $p < .01$, meaning that there was less than a 1% chance of concluding that a significant relationship between variables existed when, in fact, it did not exist. Due to the large sample size, a more conservative probability of $p < .01$ is used throughout the current study. Cramer’s V was also used to determine how strongly the variables were related; the closer Cramer’s V was to 1, the stronger the relationship between variables. Based on $H_1$, which predicts that youths who reside in urban areas are more likely than youths who live in rural areas to be rated at a higher risk level for recidivism, it was expected that a statistically significant relationship would be found where a higher proportion of youths residing in urban communities fell into moderate-high and high-risk groups compared to youths residing in rural areas. The assumptions of chi-square analyses were met because both the IV and DV were categorical (Community type = urban, rural; Risk level = low, moderate, moderate-high, high); the data were given in raw frequencies rather than percentages; the levels of the variables were mutually exclusive; the study groups were independent; and the frequency count for each cell of the table exceeded five (McHugh, 2013).

To answer RQ2, which asks whether there are differences in type of risk across offenders living in urban and rural communities, a series of one-tailed, independent samples $t$-tests was performed to compare the average score of each PACT domain used to measure each of the eight DVs (i.e., risk factor scores for various types of risk factors for recidivism) across urban and rural zip codes. One-tailed tests were conducted because the hypotheses are all directional; some predicting higher scores for urban youths, others predicting higher scores for rural youths. For
example, for H₂, which predicts that youths who reside in urban areas are more likely than youths who live in rural areas to be rated at a higher risk level for antisocial behavior, a t-test compared the mean of urban youths’ PACT scores for “Domain 1: Record of Referrals” with the mean of rural youths’ Domain 1 scores. For each hypotheses H₂ through H₁₀, the mean of the scores of each PACT domain that corresponds to each DV was compared for urban and rural youths’ scores. If a statistically significant difference (p < 0.01) was found, then the hypotheses was supported, and it was concluded that types of risks do vary across urban and rural youths. The direction of each test showed which risk factors are more likely to be found in which type of community. Finally, the eta-squared measure indicated how large the difference in likelihood was between urban and rural youths to experience each risk factor. The assumptions for the independent samples t-test were met because the IV (community type) is categorical with two levels, and the two levels of the variable (urban, rural) are independent of each other. The second assumption, normality of distribution of the DV, was met in part because the DVs (PACT domain scores for various risk factors) are continuous. The last requirement of the normality assumption is that the DVs were approximately normally distributed, which was established with preliminary descriptive analyses. The third assumption is of homogeneity of variance, which was also established in preliminary analyses using Levine’s test for equality of variances.

To answer RQ3, which asks whether the predictive validity of the PACT varies across offenders living in urban and rural communities, bivariate and multivariate analyses were performed. First, area under the curve estimates were calculated, particularly receiver operating characteristic (ROC) curves which are commonly used to assess the predictive validity, at the bivariate level, of overall risk level determined by a risk assessment instrument. Then, two separate logistic regression models were conducted; one included youths who reside in urban zip
codes; the other included youths who reside in rural zip codes. Each regression model generated an odds ratio for each variable included in the model, and specifically, identified the odds of the PACT overall risk score accurately predicting a youth’s risk for recidivism in each community type while controlling for gender, age, race/ethnicity, and year of referral. A series of logistic regression models were conducted using each PACT risk level as the reference category (i.e., rotating the reference category) to ensure a detailed comparison of the predictive validity of the PACT across community type. In cases where risk level categories were significant in both urban and rural models, a correlation coefficient comparison test was performed to determine the magnitude of difference across the two models (Paternoster et al., 1998). The calculation for the coefficient comparison test was performed by standardizing the calculated correlation coefficient found in each regression model based on its standard deviation from the mean; the result was the z value (Cohen et al., 2003). The z-values for the risk score coefficients in each model for each community type were compared to determine which had a greater magnitude, thus a greater PACT predictive ability. If the z-value was statistically significant, this indicated that there were statistically significant differences across urban and rural zip codes for different categorizations of risk level for recidivism. Based on H_{10}, it was expected that the PACT would have greater predictive ability in urban areas.

To answer the second part of RQ3, which asks whether the time to recidivism varies across offenders living in urban and rural communities, Kaplan-Meier survival curves were used to determine the distribution of time to recidivism and to compare the times at various points across juveniles who resided in urban and rural zip codes. Next, a Cox regression test was conducted to determine whether there were significant differences at each timepoint for urban offenders and rural offenders to recidivate. Based on H_{11}, it was expected that offenders living in
urban areas would have a shorter time to recidivism than would offenders living in rural areas.

The next chapter discusses the results of the analyses.
CHAPTER 5: RESULTS

This study has several research goals. The first is to examine whether there are differences in the level of risk of recidivism across offenders living in urban and rural communities. The second is to examine whether there are differences in the types of risk across offenders living in urban and rural communities. The third is to examine whether the ability of the PACT to predict the odds of recidivism differs across urban and rural communities in Florida. Finally, the fourth goal is to determine whether the time to recidivism varies significantly across offenders living in urban and rural communities. This chapter reports the results of the study.

Descriptive Analyses

Descriptive analyses of gender, age, race/ethnicity, year probation started, criminal history, community type of youths’ residences (urban or rural), and recidivism incidents are presented in Table 3. Most youths (76.0%) in the final sample were male (n = 7,772) and 24.0% were female (n = 2,457). The mean age at the time of referral to FDJJ was 13.7 years (range = 6 to 17). For race/ethnicity, 5,054 (49.4%) were categorized as White, 3,612 (35.3%) as Black, and 1,563 (15.3%) as Hispanic.
Table 3: Sample Demographics (n = 10,229)

<table>
<thead>
<tr>
<th>Descriptive Variable</th>
<th>Frequency (n)</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>7772</td>
<td>76.0</td>
</tr>
<tr>
<td>Female</td>
<td>2457</td>
<td>24.0</td>
</tr>
<tr>
<td>Race/Ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>5054</td>
<td>49.4</td>
</tr>
<tr>
<td>Black</td>
<td>3612</td>
<td>35.3</td>
</tr>
<tr>
<td>Hispanic</td>
<td>1563</td>
<td>15.3</td>
</tr>
<tr>
<td>Age at Referral to FDJJ</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Under 10</td>
<td>329</td>
<td>3.2</td>
</tr>
<tr>
<td>10-11</td>
<td>913</td>
<td>8.9</td>
</tr>
<tr>
<td>12-13</td>
<td>3137</td>
<td>30.7</td>
</tr>
<tr>
<td>14-15</td>
<td>3946</td>
<td>38.5</td>
</tr>
<tr>
<td>16-17</td>
<td>1904</td>
<td>18.6</td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>13.7 (1.9)</td>
<td></td>
</tr>
<tr>
<td>Risk of Recidivism</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>872</td>
<td>8.5</td>
</tr>
<tr>
<td>Moderate-High</td>
<td>2335</td>
<td>22.8</td>
</tr>
<tr>
<td>Moderate</td>
<td>1967</td>
<td>19.2</td>
</tr>
<tr>
<td>Low</td>
<td>5055</td>
<td>49.4</td>
</tr>
<tr>
<td>Community Type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>9514</td>
<td>93.0</td>
</tr>
<tr>
<td>Rural</td>
<td>715</td>
<td>7.0</td>
</tr>
</tbody>
</table>

The highest number of youths were rated as low risk to recidivate (n = 5055, 49.4%) and the lowest number of youths were rated as high risk to recidivate (n = 872, 8.5%). At the time of their referral to FDJJ, the vast majority of youths (93.0%) resided in urban communities and 7.0% resided in rural communities. Of note, in the general population of Florida there were 1,848,184 youths aged 10-17 years. Of those, 94.1% (n = 1,739,370) resided in urban communities and 5.9% (n = 108,814) resided in rural communities (U.S. Census Bureau, 2010).
So, the distribution of urban and rural youths in the sample closely reflects that of the general population of youths in Florida. A description of the PACT domain scores is provided in Table 4.

Table 4: Descriptive Statistics for PACT Risk Domain Scores (n = 10,229)

<table>
<thead>
<tr>
<th>PACT Domain (Hypothesis)</th>
<th>Mean</th>
<th>SD</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Record of Referrals (H2)</td>
<td>6.99</td>
<td>3.55</td>
<td>0</td>
<td>24</td>
</tr>
<tr>
<td>Current Mental Health (H3)</td>
<td>0.13</td>
<td>0.49</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Attitudes/Behaviors (H4)</td>
<td>4.67</td>
<td>4.01</td>
<td>0</td>
<td>23</td>
</tr>
<tr>
<td>Current Relationships (H5)</td>
<td>2.62</td>
<td>1.75</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>Current Living Arrangements (H6)</td>
<td>5.87</td>
<td>4.12</td>
<td>0</td>
<td>27</td>
</tr>
<tr>
<td>Current School Status (H7)</td>
<td>5.34</td>
<td>4.52</td>
<td>0</td>
<td>22</td>
</tr>
<tr>
<td>Current Use of Free Time (H8)</td>
<td>0.22</td>
<td>0.41</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Current Alcohol and Drugs (H9)</td>
<td>2.32</td>
<td>3.88</td>
<td>0</td>
<td>25</td>
</tr>
</tbody>
</table>

Research Question 1: Community Type and Level of Risk for Recidivism

To answer RQ1 and examine whether there are differences in level of risk of recidivism across offenders living in urban and rural communities, crosstabulation (crosstab) and chi-square analyses were performed to determine the joint frequency values for the community type (IV) and the risk level (DV). The results are shown in Table 5.

Table 5: Level of Risk of Recidivism Across Community Type

<table>
<thead>
<tr>
<th>Community Type</th>
<th>Low n (%)</th>
<th>Moderate n (%)</th>
<th>Moderate-High n (%)</th>
<th>High n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban</td>
<td>4623 (48.6)</td>
<td>1832 (19.3)</td>
<td>2217 (23.3)</td>
<td>842 (8.9)</td>
</tr>
<tr>
<td>Rural</td>
<td>432 (60.4)</td>
<td>135 (18.9)</td>
<td>118 (16.5)</td>
<td>30 (4.2)</td>
</tr>
</tbody>
</table>

Chi-square analyses showed a statistically significant relationship between PACT risk level and community type ($x^2(3, N=10229) = 49.24, p < 0.001$). Cramer’s V was used to determine how strongly the variables were related; the closer Cramer’s V is to 1, the stronger the relationship between variables. In this case, Cramer’s V = 0.07, indicating that the relationship
between risk level and community type is weak. Based on H₁, which predicts that youths who reside in urban areas are more likely than youths who live in rural areas to be rated at a higher risk level for recidivism, it was expected that a higher proportion of youths residing in urban communities would be rated moderate-high and high risk compared to youths residing in rural areas. The hypothesis is partially supported. There is a statistically significant difference in level of risk to recidivate across urban and rural youths and the proportion of high-risk youths in urban areas (8.9%) was more than double the rural high-risk group (4.2%). For the moderate-high risk group, the proportion of urban youths (23.3%) was also higher than rural youths (16.5%). Thus, the pattern shown by the percentages suggested that more urban youths tended to be in the higher risk categories compared to rural youths.

**Research Question 2: Community Type and Types of Risk for Recidivism**

To answer RQ2 and examine whether there are differences in type of risk of recidivism across offenders living in urban and rural communities, a series of one-tailed, independent samples t-tests were performed to compare the average score of each PACT domain across youths residing in urban and rural zip codes. Types of risk were operationalized by using corresponding PACT domains and were measured using domain scores. The results are shown in Table 6.

<table>
<thead>
<tr>
<th>PACT Domain (Hypothesis)</th>
<th>$M_{score}$ (SD)</th>
<th>$M_{score}$ (SD)</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Record of Referrals (H₂)</td>
<td>7.05 (3.57)</td>
<td>6.17 (3.17)</td>
<td>6.38*</td>
</tr>
<tr>
<td>Current Mental Health (H₃)</td>
<td>0.13 (0.49)</td>
<td>0.13 (0.45)</td>
<td>-0.10</td>
</tr>
<tr>
<td>Attitudes/Behaviors (H₄)</td>
<td>4.69 (4.02)</td>
<td>4.49 (3.98)</td>
<td>1.27</td>
</tr>
<tr>
<td>Current Relationships (H₅)</td>
<td>2.64 (1.75)</td>
<td>2.38 (1.75)</td>
<td>3.89*</td>
</tr>
<tr>
<td>Current Living Arrangements (H₆)</td>
<td>5.87 (4.11)</td>
<td>5.90 (4.29)</td>
<td>-0.19</td>
</tr>
<tr>
<td>Current School Status (H₇)</td>
<td>5.36 (4.52)</td>
<td>5.10 (4.51)</td>
<td>1.53</td>
</tr>
</tbody>
</table>
The PACT domain mean scores that significantly varied across urban and rural youths were record of referrals, current relationships, and current use of alcohol and drugs. These domains respectively correspond to past antisocial behavior (H₃), current antisocial peers (H₅), and current alcohol and drug abuse (H₉). The t-values suggest that, on average, the risk factors are higher for urban youths than for rural youths. Thus, the hypotheses that stated youths who reside in urban areas are more likely than youths who live in rural areas to be rated at a higher risk level for antisocial behavior (H₂) and antisocial peers (H₅) were supported. However, the hypothesis that stated youths who reside in rural areas are more likely than youths who live in urban areas to be rated at a higher risk level for substance abuse (H₉), was not fully supported.

While there is a significant difference in substance abuse across urban and rural youths, findings indicate that the risk is greater for urban rather than rural youths. Subsequent eta-squared measure indicated the magnitude of differences between urban and rural youths to experience each of the three significant risk factors. Eta-squared for “Record of Referrals” was <0.01; Eta-squared for “Current Relationships” was < 0.01; Eta-squared for “Current Alcohol and Drugs” was <0.01. Moreover, even though the difference between mean scores for urban and rural youths was statistically significant for three domains, the ranges of those domains were 0 to 24 for “Record of Referrals”, 0 to 9 for “Current Relationships”, and 0 to 25 for “Current Alcohol and Drugs”, so the significant differences were less than one point in all three cases (0.88, 0.26, 0.52 respectively). Relative to the ranges of each domain, the differences were substantively small.
Research Question 3: Predictive Validity of the PACT and Time to Recidivate

To answer the first part of RQ3 and examine whether the predictive validity of the PACT varies across juveniles living in urban and rural communities, bivariate and multivariate analyses were performed. First, AUC estimates were calculated, particularly receiver operating characteristic curves which are commonly used to assess predictive validity at the bivariate level of overall risk level determined by a risk assessment instrument. Results are shown in Table 7.

Table 7: Recidivism Across Community Type

<table>
<thead>
<tr>
<th>Recidivism</th>
<th>Yes n (%)</th>
<th>No n (%)</th>
<th>AUC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full sample</td>
<td>4919 (48.1)</td>
<td>5310 (51.9)</td>
<td>.39</td>
</tr>
<tr>
<td>Urban only</td>
<td>4623 (48.6)</td>
<td>4891 (51.4)</td>
<td>.39</td>
</tr>
<tr>
<td>Rural only</td>
<td>296 (41.4)</td>
<td>419 (58.6)</td>
<td>.42</td>
</tr>
</tbody>
</table>

Table 7 indicates that for the full sample, nearly half (48.1%) the youths recidivated. For urban youths, the rate of recidivism was higher (48.6%) than it was for rural youths (41.4%). Chi-square analyses showed a statistically significant relationship between recidivism and community type ($\chi^2(1, N=10229) = 13.78, p = 0.00$). Cramer’s V was 0.04, indicating that the relationship between recidivism and community type was weak. Area under the curve estimates showed that the predictive ability of the PACT overall (AUC = .39; 95% CI [.38, .40]), as well as for urban (AUC = .39; 95% CI [.38, .40]) and rural (AUC = .42; 95% CI [.38, .47]) youths taken as separate groups, was weak to moderate. The CIs for the AUCs of urban and rural groups overlap, indicating that the difference between the two groups is not meaningful.

Table 8 shows the results of three separate logistic regression models. The first model included all youths in the sample, the second model included youths who resided in urban zip codes, and the third model included youths who resided in rural zip codes. The models analyzed
how well the PACT predicted risk to recidivate for youths in each risk category across community type.

Table 8: Odds of Youths Recidivating Across Community Type

<table>
<thead>
<tr>
<th>PACT Risk Level</th>
<th>OR (SE) Total Sample (n = 10,229)</th>
<th>OR (SE) Urban (n = 9514)</th>
<th>OR (SE) Rural (n = 715)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Risk as Reference Category</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate</td>
<td>2.12 (.06)*</td>
<td>2.16 (.06)*</td>
<td>1.52 (.21)</td>
</tr>
<tr>
<td>Moderate-High</td>
<td>3.02 (.05)*</td>
<td>2.98 (.06)*</td>
<td>3.72 (.23)*</td>
</tr>
<tr>
<td>High</td>
<td>3.45 (.08)*</td>
<td>3.43 (.08)*</td>
<td>3.01 (.40)*</td>
</tr>
<tr>
<td>Moderate Risk as Reference Category</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate-High</td>
<td>1.43 (.06)*</td>
<td>1.38 (.07)*†</td>
<td>2.45 (.26)*†</td>
</tr>
<tr>
<td>High</td>
<td>1.63 (.09)*</td>
<td>1.59 (.09)*</td>
<td>1.98 (.42)</td>
</tr>
<tr>
<td>Moderate-High Risk as Reference Category</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>1.14 (.08)</td>
<td>1.15 (.09)</td>
<td>0.81 (.42)</td>
</tr>
</tbody>
</table>

Note: All models were performed with the following control variables: Gender, Age at first referral, Race/Ethnicity.
OR = Odds Ratio and SE = Standard Error
*OR was statistically significant at p < .01.
†Results were significant with the Correlation Coefficient Comparison test

Among the total sample, compared to low-risk youths, moderate risk youths were twice as likely to recidivate (OR = 2.12) and moderate-high and high-risk youths were three times more likely to recidivate (moderate-high risk OR = 3.02; high risk OR = 3.45). The odds ratios comparing moderate risk youths to moderate-high and high-risk youths were also statistically significant (p < .01). However, no statistically significant differences in the odds of recidivism among the moderate-high and high-risk youths were observed. In general, for the total sample, the odds of recidivism increased as the PACT risk level increased. However, the magnitude of differences in the odds of reoffending (i.e., OR values) decreased when comparing higher risk categories (e.g., moderate to moderate-high groups, moderate-high to high-risk groups).
For the urban sample, compared to low-risk youths, moderate risk youths were twice as likely to recidivate (OR = 2.16) and moderate-high and high-risk youths were three times more likely to recidivate (moderate-high risk OR = 2.98; high risk OR = 3.43). The odds ratios comparing moderate risk youths to moderate-high and high-risk youths were statistically significant ($p < .01$). Similar to the full sample, no statistically significant differences in the odds of recidivism among the moderate-high and high-risk youths were observed. In general, the results for the urban sample were consistent with the results for the total sample. The odds of recidivism increased as the PACT risk level increased. However, the magnitude of differences in the odds of reoffending (i.e., OR values) decreased when comparing higher risk categories.

Likewise, for the rural sample, compared to low-risk youths, moderate risk youths were 1.5 times as likely to recidivate (OR = 1.52), moderate-high risk youths were nearly four times more likely to recidivate (OR = 3.72), and high-risk youths were three times more likely to recidivate (OR = 3.01). The odds ratios comparing moderate risk youths to moderate-high risk youths was statistically significant ($p < .01$), but no statistically significant difference in the odds of recidivism among moderate and high-risk youths was observed.

The ORs for both urban and rural models showed similar trends in the odds of reoffending across risk levels, but the magnitude of the ORs varied somewhat. For example, the OR comparing moderate risk youths to high-risk youths among the urban group was 1.59, while the OR for the rural group was 1.98. Therefore, correlation coefficient comparison tests were performed to compare the ORs when the coefficient was significant among both the urban and rural youths (Paternoster et al., 1998). This included three coefficient comparison tests: 1) moderate-high risk youths across urban and rural groups when low risk was the reference category, 2) high risk youths across urban and rural groups when low risk was the reference
category, and 3) moderate-high risk youths across urban and rural groups when moderate risk was the reference category. The results of the coefficient comparison tests showed that the magnitude of difference in ORs across urban and rural youths in the group rated as moderate-high when moderate risk was used as the reference category was the only statistically significant estimate ($z = -2.13, p < 0.01$, two-tailed). This means that the odds of moderate-high risk youths recidivating compared to moderate risk youths were higher among urban youths. Based on $H_{10}$, it was expected that the PACT would have stronger predictive validity in urban areas. Based on the coefficient comparison tests, this hypothesis was supported for moderate and moderate-high risk youths.

**Time to Recidivate Across Community Type**

To answer the second part of RQ3, which asks whether the time to recidivism varies across offenders living in urban and rural communities, Kaplan-Meier survival curves were used to determine the distribution of time to recidivism and to compare the times at various points across urban and rural offenders. The results showed that there was more separation across risk levels, especially around the time-period between 12 to 18 months after probation began, for urban youths than there was for rural youths. The average time to recidivate for urban youths across all risk levels was 216 days ($SE = 2.94$) and for rural youths it was 237 days ($SD = 13.18$). The confidence intervals (CIs) for all risk levels overlap for both urban and rural youths, meaning that the differences in time to recidivate between urban and rural youths was not statistically significant. The lower risk youths in both the urban and rural groups took longer to recidivate than did higher risk youths. Results are shown in Figure 1 below, which is disaggregated across youth who reside in urban and rural communities.
Next, a Cox regression test was conducted to determine whether there were significant differences at each timepoint for urban and rural juveniles to recidivate while controlling for other relevant factors. Based on H$_{11}$, it was expected that juveniles living in urban areas will have a shorter time to recidivism than offenders living in rural areas.

Figure 1: *Days to Recidivate Across Community Type*
Table 9: *Cox Regression using Risk to Reoffend as the Predictor Variable*

<table>
<thead>
<tr>
<th>PACT Risk Level</th>
<th>Hazard Ratio (SE) Urban</th>
<th>Hazard Ratio (SE) Rural</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Risk as Reference Category</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate</td>
<td>1.15 (.04)*</td>
<td>1.48 (.16)</td>
</tr>
<tr>
<td>Moderate-High</td>
<td>1.31 (.04)*</td>
<td>1.37 (.15)</td>
</tr>
<tr>
<td>High</td>
<td>1.42 (.05)*</td>
<td>1.00 (.26)</td>
</tr>
<tr>
<td>Moderate Risk as Reference Category</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate-High</td>
<td>1.14 (.04)*</td>
<td>0.93 (.18)</td>
</tr>
<tr>
<td>High</td>
<td>1.24 (.04)*</td>
<td>0.68 (.27)</td>
</tr>
<tr>
<td>Moderate-High Risk as Reference Category</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>1.09 (.05)</td>
<td>0.73 (.27)</td>
</tr>
</tbody>
</table>

*Hazard Ratio was statistically significant at \( p < .01 \).

Notes: All models were run with control variables (Gender, Age at first referral, Race/Ethnicity).

Overall, risk to recidivate was a significant predictor of future recidivism for both urban \( \chi^2(7, N=9514) = 107.65, p = 0.00 \) and rural \( \chi^2(7, N=715) = 20.36, p = 0.01 \) youths.

Overall, the full model, which included CVs, was significant and predicted time to recidivism for both urban \( \chi^2(7, N=9514) = 107.65, p = 0.00 \) and rural \( \chi^2(7, N=715) = 20.36, p = 0.01 \) youths. However, risk level as its own individual effect did not predict recidivism. There were no statistically significant differences in time to recidivate across risk levels for rural youths. For urban youths, there were significant differences in the incidence of recidivism across risk levels, and they aligned with the expectation that higher risk youths recidivated more often and quicker than did lower risk youths. For example, there was a significant difference between low-risk urban youths and moderate risk urban youths (HR = 1.15, SE = 0.04) and between low-risk urban youths and moderate-high risk urban youths (HR = 1.31, SE = 0.4), meaning that compared to low-risk youths, higher risk youths had an increased hazard of recidivating and recidivated sooner. When compared to moderate risk urban youths, moderate-high (HR = 1.14, SE = 0.04) and high risk (HR = 1.24, SE = 0.04) urban youths took longer to recidivate. The next
chapter discusses the implications of the results, limitations of the current study, and suggestions for future research.
CHAPTER 6: DISCUSSION

The overarching aims of this study were to examine how youths’ level and types of risk vary across urban and rural communities and to evaluate the predictive ability of the PACT to predict the odds of reoffending as well as the time to reoffend across urban and rural communities. Research questions were generated based on existing literature (Osgood & Chambers, 2003; Weisheit & Donnermeyer, 2000; Weisheit et al., 1999) and theoretical principles (e.g., SDT, RNR model). This chapter will discuss key findings, theoretical and practical implications, limitations of the current study, and suggestions for future research.

**Key Findings and Implications**

The first research question focused on levels of risk to reoffend across youths residing in urban and rural communities. Based on prior studies, it was expected that youths who lived in urban areas would be rated at a higher risk level for recidivism. Though the relationship was weak, the bivariate patterns showed that a greater proportion of urban youths were rated at higher risk categories than rural youths. More specifically, the proportion of urban youths in the high-risk category (8.9%) was more than double the proportion of rural youths in that category (4.2%). In the moderate-high risk category, the proportion of urban youths (23.3%) was nearly one-third more than rural youths (16.5%).

On the one hand, the weak relationship between PACT-rated risk level for recidivism and community type was not altogether surprising. Past studies showed that even though key risk factors for delinquency tend to be more prevalent in urban areas than in rural areas, many of the same risk factors still exist in rural areas (Moore & Sween, 2015; Nelson et al., 2010). On the other hand, the greater proportion of high-risk youths in urban communities, compared to rural communities, was expected (i.e., hypothesized). Studies have consistently found that rates of
serious crime and delinquency tend to be higher in urban areas than in rural areas (Moore & Sween, 2015; Osgood & Chambers, 2003; Weisheit & Donnermeyer, 2000; Weisheit et al., 1999). In addition, past studies have found that the prevalence of risk factors is greater in urban areas. For example, Elgar et al. (2003) found that youths from urban areas have higher rates of antisocial behavior, antisocial peers, and school problems than youths from rural areas. Urban settings are densely populated, so urban youths are more likely to associate with antisocial peers. Also, youths living in urban areas are more likely to have family problems, such as living in single-parent households, than youths from rural areas (U.S. Census Bureau, 2016).

An additional point to consider is that the differences in the proportion of youths in the higher risk categories does not take into account the severity of youths’ current offense, which could be a potential reason for these differences. Urban youths have been shown to be more likely to be charged with higher-level offenses (i.e., felonies) (Feld, 1991; Rennison and DeKeseredy, 2018), which could explain the differences in the proportion of youths in the higher risk categories found among urban youths. This means that variations in risk level may be a function of variations in current and prior offenses that exist across community type and not directly caused by community type. Unfortunately, the data on the severity of the current offense was not available which precludes an assessment of this possibility. Relying on bivariate analyses of the variability in risk categories across urban and rural youths also prevents an assessment of other legal factors that could be influencing risk estimates. This limitation is addressed below.

The second research question examined differences across type of dynamic risk for juvenile probationers living in urban and rural communities. Based on prior studies, it was expected that there would be differences in types of risk across juveniles living in urban and rural
communities. The current study used PACT subdomain scores to measure specific types of risk across youths in urban and rural communities. Of the eight types of risks examined (past antisocial behavior, current mental health problems, current antisocial attitudes, current antisocial peers, current family problems, current problematic school experiences, current antisocial leisure activities, and current substance abuse), only three varied significantly across community type. Average risk scores for record of referrals (used to measure past antisocial behavior), current relationships (used to measure whether a youth currently has antisocial peers), and current alcohol and drug use (used to measure current substance abuse) were found to be higher among urban youths on probation compared to rural youths on probation. Importantly, however, relative to the ranges of each domain, even the statistically significant differences were substantively small.

It was hypothesized that urban youths would be rated at higher risk levels for past antisocial behavior, current antisocial attitudes, current antisocial peers, current family problems, and current problematic school experiences. Findings showed that this expectation was supported for antisocial behavior and antisocial peers only. Rural youths were expected to be rated at higher risk levels for current mental health problems, current antisocial leisure activities, and current substance abuse. Findings showed that these expectations were not supported. While there was a significant difference in substance abuse across urban and rural youths, the risk was greater for urban rather than rural youths.

The third research question measured the ability of the PACT to predict the odds of reoffending and time to reoffend across juvenile probationers living in urban and rural communities. The first step in answering this question was to evaluate baseline differences in recidivism. The current study found a significant relationship between recidivism and
community type. The rate of recidivism was higher for urban youths (48.6%) than it was for rural youths (41.4%). This aligns with past studies that found delinquency rates to be higher in urban areas than in rural areas (Moore & Sween, 2015; Osgood & Chambers, 2003).

The overall predictive ability of the PACT in this study was weak to moderate (AUC = .39). This does not fully align with past studies that found that the predictive ability of the PACT overall was moderate to good. Baglivio and Jackowski (2013) found that the AUC was .58 and Early et al. (2012) found an AUC of .62. Like the current study, both prior studies used new adjudications, adjudications withheld, or convictions during a 12-month follow-up period as the indicator of recidivism, but, unlike the current study, the follow-up period began after probation ended. The current study’s follow-up period begins from the time probation started. Including time on probation in the recidivism follow-up period could explain why the AUCs in the current study are lower than in past studies. Youths on probation, regardless of their risk level, are generally under closer supervision than youths who have completed probation. That is, under supervision, youths are monitored closely, regardless of risk level, so recidivism while on probation may not necessarily be a strong correlate of reoffending behavior. Had the follow-up time not included time on probation, youth might have reoffended at a rate closer to that predicted by the PACT risk level.

Since only a handful of past studies have validated the PACT, and none have considered differences across community type, this component of the current study is exploratory. Findings from the current study indicated that the predictive validity of the PACT differed across urban and rural communities in Florida - but only for moderate and moderate-high risk youths. Among rural youths, there were no significant differences in the odds of reoffending across moderate risk and high-risk youths. However, among urban youths, those in the high-risk group were 59%
more likely to reoffend than those in the moderate risk group. Likewise, in urban areas, moderate risk youths were more likely to recidivate than low risk youths, but in rural areas, no differences were found in the odds of recidivism across moderate risk youths and low risk youths. Similar findings were revealed when predicting time to recidivate across urban and rural communities. Higher risk youths in urban areas recidivated quicker than lower risk youths. This is consistent with prior studies (Baglivio, 2009; Baglivio & Jackowski, 2013; Early et al., 2012; Martin, 2012). However, for rural youths, there were no statistically significant differences in time to recidivate across risk levels. This means that the PACT predicted both the odds of recidivism and time to recidivism more accurately for urban youths than for rural youths.

These findings are not surprising. Because most U.S. youths (92.6%) live in urban areas (HHS, 2016) and the ecological, social, and structural characteristics most strongly related to increased crime and delinquency rates are the same characteristics found more prevalently in urban rather than rural areas, the majority of previous research on delinquency rates and individual delinquency has been based on urban areas and urban youths (Bouffard & Muftic, 2006; Kaylen & Pridemore, 2013). Since juvenile risk assessment instruments are based on the findings from these studies on urban youths, it is likely that the instruments have also been validated mainly using samples of urban, rather than rural, youths (Bouffard & Muftic, 2006; Kaylen & Pridemore, 2013). However, the implications of these findings are important because they show that rural youths are likely disadvantaged by the PACT’s inability to distinguish between risk categories among probationers residing in rural areas. Overall, these findings suggest that rural youths may be at a disadvantage during disposition decision-making given Florida’s reliance on the disposition matrix that considers risk to reoffend as a key factor in
determining disposition recommendations. The policy implications of this finding are discussed in detail below.

Most findings from the current study align with prior research. Previous studies have consistently found that rates of serious crime and delinquency tend to be higher in urban areas than in rural areas (Moore & Sween, 2015; Osgood & Chambers, 2003; Weisheit & Donnermeyer, 2000; Weisheit et al., 1999). Variations in crime across urban and rural communities have been attributed to variations in the characteristics of urban and rural areas (Nelson et al., 2010; Wells & Weisheit, 2004). Furthermore, community characteristics have a differential impact on behavior by creating, moderating, or mediating risk and protective factors that contribute to the development of criminality in youth (DeMatteo & Marczyk, 2005).

The paucity of research on rural crime and delinquency could be one of the reasons why the findings of the current study, which focused on both urban and rural youths, did not always align with prior research. The PACT incorporates principles of reassessment(s), responsivity, protective factors, and the Central Eight risk factors (Baglivio & Jackowski, 2013; Baird et al., 2013). Historically, these concepts have been the focus of studies done mainly in urban areas (Andrews & Bonta, 2010; Latessa & Lowenkamp, 2005). This is important because in the current study, when significant differences were found across urban and rural areas for how well the PACT predicted youths’ risk for recidivism, the instrument made more accurate predictions for urban youths. Thus, for more accurate and equitable risk assessment of youths across community type, it is critical that further research be done to increase understanding of how different types of risk assessment instruments perform among youths in rural areas.

This implies that there may be a problem with the PACT’s predictive validity because of the way the scoring matrix is set up for categorizing youths into risk levels. In other words, the
matrix described in Table 2 may not be appropriate for rural youths. This becomes even more of a concern because the scores generated by the scoring matrix are then applied to a disposition matrix used to determine youths’ sanctions and treatment linkages (Baglivio & Russell, 2014). More restrictive sanctions, such as probation and commitment to residential facilities, are imposed on higher risk youths, whereas less restrictive sanctions, such as diversion, are imposed on lower risk youths. Inaccurate risk level categorization can result in youths with high risk ratings getting more restrictive sanctions than those that youths with moderate risk ratings get, even though the high risk youths have no greater odds of recidivating. The practical implications of inconsistencies in the PACT’s predictive validity across urban and rural communities are discussed in a later section.

**Geographic Isolation of Rural Areas**

Community characteristics that vary across urban and rural areas could provide possible explanations for some of the results. One ecological community characteristic, the geographic isolation of rural areas, could explain why PACT domain mean scores for current antisocial attitudes did not significantly vary across urban and rural youths. There is a dearth of studies done on whether antisocial attitudes vary across community type. The basis for the expectation that urban youths would be rated at a higher risk level for having antisocial attitudes was not so much based on concrete findings from past studies but inferred from studies (Matsueda & Heimer, 1987; Sutherland, 1942) that found that youths with antisocial attitudes tend to adopt those attitudes from the peers with which they have close and frequent associations. Urban settings are densely populated and have more community and recreation centers than rural areas have, so the frequency with which a youth will associate with other youths is higher than in rural settings (Evans, 2006). Due to the increased frequency with which urban youths associate with
each other, the likelihood of a youth having peers with antisocial attitudes was expected to be higher in urban areas than it was in rural areas. However, it is possible that the plethora of people and community centers in urban areas does not contribute as much to the formation of close, frequent associations among youths as does the loneliness garnered by geographic isolation. In an urban area, if a youth associates with peers who have antisocial attitudes, he or she could more easily leave those associations and find peers with prosocial attitudes than could a rural youth from an isolated area. Thus, if the formation of close, frequent peer associations from which antisocial attitudes are adopted or perpetuated occurs in densely populated urban areas as well as geographically isolated rural areas, then this could explain why PACT domain mean scores for current antisocial attitudes did not significantly vary across urban and rural youths.

Geographic isolation could also explain the lack of differences found in current family problems across community type. In macro-level urban studies, family problems were measured by the rate of single-parent households (Wells & Weisheit, 2004). While urban areas have higher rates of single-parent households, the geographic isolation of rural areas often results in long work commute times or other familial barriers, which could subsequently leave youths unsupervised for long periods of time or impede on the time needed for building strong parent-child attachment and involvement. This effect could mimic or serve as a proxy for lower levels of supervision typically found in single-parent homes. This could lower the gap between the expected likelihood of urban youths having family problems and rural youths, who were traditionally believed to have low levels of family problems (Adam & Chase-Lansdale, 2002; Bouffard & Muftic, 2006; Brody & Flor, 1998; Cotton, 2016; Haynie & South, 2005).

The expected differences across community type were not found in the current study for mean scores of current school problems. It was expected that urban youths would have higher
levels of school problems, but the findings show that rural youths’ level of school problems was not significantly different than that of urban youths. Thus, there may be similar problems present within both urban and rural schools. Problems in rural schools could be attributed to the geographic isolation of rural areas. This isolation means that rural youths often have long commutes to school which make it difficult to participate in extracurricular school activities or seek extra academic help before or after school. Additionally, parents’ long commutes to work and other familial demands could affect how involved they are in their children’s school attendance, schoolwork, or school activities (Uliaszek et al., 2013). Rural staff and teachers’ long commutes to work could mean they are less available to provide extra academic help or extracurricular activities. Lastly, geographic isolation could impede students’ ability to receive help or support from each other outside of school. So, even though past studies have shown rural schools have more protective factors than urban schools, such as lower teacher-to-student ratios, smaller student populations, and close-knit relationships between students and between students and staff (Lipsey & Derzon, 1998; McIntire et al., 1990), the geographic isolation typical of rural schools creates an obstacle to the moderating impact of those protective factors by potentially decreasing students’ exposure to them.

**Community Cohesion in Rural Areas**

Although prior studies have found that youths living in rural areas were more likely to experience poorer mental health and lower levels of happiness (Galliher et al., 2004; Levin, 2014), less likely to participate in treatment programs for mental health care (SAMHSA, 2012), and less likely to have access to mental healthcare services and mental health care providers (Evans, 2006; Gamm et al., 2002), research also shows that community cohesion is a social characteristic that is found at higher rates in rural areas than in urban areas (Bouffard & Muftic,
2006; Nelson et al., 2010). Thus, stronger community cohesion could explain why PACT domain mean scores for current mental health problems did not significantly vary across urban and rural youths (as expected). More specifically, one possible explanation for the unexpected findings that aligns with the principle of social disorganization and collective efficacy is the higher levels of community cohesion found in rural communities (Nelson et al., 2010). The close-knit community aspect could be providing prosocial mental health support outside of traditional counseling and treatment programs. Residents of rural areas, more than in urban areas, tend to expect that families, neighbors, and churches will deal with youths’ mental health problems rather than traditional mental healthcare providers (Judd et al., 2006; Stewart et al., 2016). The shortage of providers in rural areas might not be impacting the rates of mental health problems to the extent that prior research showed. Thus, the relatively extensive availability of professional mental health care providers in urban areas could be as effective as informal mental health support in rural areas, explaining why there was no difference in mental health scores across urban and rural youths.

Together, the findings suggest that these risk domains appear to be empirically similar in their relationship to reoffending. However, as described above, it is likely that the mechanisms or causal processes that lead to the ways in which each type of risk factors leads to reoffending, such as the ways in which collective efficacy impacts risk factors for recidivism, may differ. In other words, empirical analyses might not show significant differences in the prevalence of a risk factor across urban and rural communities, but the pathways that connect community characteristics (e.g., such as social cohesion) to the specific risk factor (e.g., mental health status) and recidivism likely vary across community type. For example, the current study found that there was no significant difference in mean scores between urban and rural youths for having
antisocial peers. However, significant differences in how or why antisocial peer associations are formed might exist, and those differences might vary significantly across community type. Risk assessment instruments that measure only individual-level risk factors are not necessarily examining the causes of those risk factors or considering how each individual-level risk factor is impacted by transitions and trajectories that occur along the pathway from macro- to micro-level factors.

**Theoretical Implications**

The foundation of this study’s theoretical framework is that macro-level community characteristics vary across urban and rural areas, and those characteristics directly or indirectly influence individual risk factors for recidivism. In the current study, hypotheses were formed based on the expectation that a juvenile’s risk level and type and severity of risk factors, as well as the PACT’s predictive accuracy, would vary across community type. Regarding risk level, a higher proportion of urban youths were rated at higher risk levels than rural youths. Regarding types and severity of risk factors, urban youths’ PACT scores for antisocial behavior, having antisocial peers, and substance abuse were significantly higher than rural youths’ scores. This aligns with the theoretical framework because urban areas have higher rates of social disorganization (Bouffard & Muftic, 2006; Nelson et al., 2010), and, subsequently, lower levels of collective efficacy (Judd et al., 2006; Larson & Corrigan, 2010; Stewart et al., 2016). The theoretical implications of how weak collective efficacy influences individual risk factors is discussed in detail below.

Lower levels of collective efficacy reduce a community’s ability to recognize, supervise, and intervene in youths’ behavior, peer associations, and substance use in several ways. In such
areas, residents are less likely to know and trust each other. Residents are also less likely to have shared goals and values (Sampson et al., 1997). Residents would be less likely to intervene if they saw a youth misbehaving, or to report that misbehavior to the youth’s guardians. Without shared community goals and values, there might not be a consensus on what constitutes “antisocial” behavior, thus further reducing the likelihood of adults intervening in or reporting it.

Regarding substance abuse, it would be easier for youths to illegally obtain, use, and persist in using illicit substances in areas with lower levels of collective efficacy. In these areas, residents are not only less likely to supervise youths, but also to recognize people from outside the community who come in to supply local youths with drugs and/or alcohol. Likewise, local suppliers of such substances would be less likely to recognize underage buyers. Finally, based on SDT, areas with lower levels of collective efficacy have higher rates of crime and delinquency, which means that urban areas may be more likely than rural areas to have a greater number of criminal or delinquent people willing to supply underage youths with illicit substances. Thus, rates of social disorganization differ across urban and rural communities. When components of social disorganization (e.g., low SES, residential instability, racial/ethnic heterogeneity) occur at high rates in a community, the collective efficacy in the community can be weakened. In areas with weak collective efficacy, mechanisms or causal pathways that connect collective efficacy to risk factors for recidivism can be impacted. These mechanisms include the willingness or ability of residents to collectively supervise youths’ behavior by getting to know the youths, recognizing their peers, intervening when misbehavior takes place, or communicating concerns with the youths’ parents or guardians. However, as discussed above, these mechanisms or causal pathways may differ across urban and rural areas due to differing characteristics of each type of
community, such as high rates of residential instability. Thus, youths’ misbehavior or exposure to risk factors could go unnoticed or unimpeded, leading to an increased likelihood of recidivism.

The PACT predicted the odds of reoffending for moderate and moderate-high risk youths in urban areas in Florida, but not in rural areas. Additionally, the PACT predicted the time to reoffend for youths in urban areas in Florida, but not in rural areas. The greater predictive ability of the PACT in urban areas was expected and aligns with Andrews and Bonta’s (2010) identification of the Central Eight risk factors. This is because the “Central Eight” are the same factors upon which the PACT is based and, by extension, the variables in the current study are based. The current study shows that when significant differences across community type were found in youths’ scores for the types and severity of risk factors, they were higher for urban youths. So, on the one hand, it is not surprising that the PACT predicted risk for urban youths. On the other hand, the PACT did not predict the odds of reoffending nor the time to reoffend for rural youths. Partial support was found for Andrews and Bonta’s (2010) risk principle because risk factors were found in both urban and rural areas. Additionally, risk factors are more prevalent in urban areas, and urban youths had greater odds of recidivism than did rural youths. Also, indirect support was found for SDT and collective efficacy because rates of SDT tend to be higher in urban areas and levels of collective efficacy tend to be lower in urban areas. Both of these patterns are associated with higher rates of recidivism and the current study found that urban youths had greater odds of recidivism than rural youths. The current study did not aim to test theories. Moreover, a significant limitation of this study was its use of bivariate analysis which did not allow for deeper examination of specific components of SDT and collective efficacy. Thus, generating further theoretical implications was difficult. Future research (discussed in a later section) is needed to examine how specific community characteristics, based
on tenants of SDT and collective efficacy, influence risk factors for delinquency and the predictive validity of the PACT (and other risk/needs assessments).

**Practical Implications**

Florida has one of the largest state-centralized juvenile justice systems in the U.S. (Baglivio & Jackowski, 2013). According to the U.S. Census Bureau (2010), 94.1% (n = 1,739,370) of youths in Florida aged 10-17 resided in urban communities and 5.9% (n = 108,814) resided in rural communities. Therefore, it is imperative to examine how community type impacts risk factors for delinquency and how the use of a statewide assessment instrument operates across geographic regions. These examinations can help to ensure that groups of youths are not being disadvantaged by significant differences in how risks are assessed and, by extension, how dispositions and treatment linkages are made. The current study found that there is a significant but weak relationship between PACT risk level for recidivism and community type and that urban youths are more likely than rural youths to be rated at a higher risk level for recidivism. In addition, urban youths are more likely than rural youths to be rated at a higher risk level for antisocial behavior, having antisocial peers, and having current substance abuse problems. Practical implications of these findings are that community type does matter when it comes to the allocation of resources across geographic entities. A larger proportion of higher risk youths in urban areas means that more intensive services are needed in those communities. Thus, this information might help drive statewide resource mapping and program implementation decisions across different jurisdictions.

The current study found that some types of risk of recidivism were significantly different across community type. Past antisocial behavior, currently having antisocial peers, and currently having substance abuse problems were factors for which urban youths were rated at higher risk
levels than rural youths. The implications of these findings are that, of all the identified risk factors for delinquency, these three should be considered within the context of intervention planning. One or more characteristics unique to urbanicity affect the likelihood of the youths in urban areas to be exposed to or influenced by those risk factors. If financial, political, or organizational decisions are made regarding where to allocate treatment resources in urban areas, the findings suggest that programs addressing youth peer associations and substance abuse might be given priority.

Evidence-based substance abuse programs such as the Adolescent Community Reinforcement Approach (A-CRA) (Godley et al., 2001) and Multidimensional Family Therapy (MDFT) (Liddle, 2010) might be more effective in urban areas. This is because these programs rely on youths, their parents/guardians, peers, and other community members with whom the youths have close relationships to meet together for frequent treatment sessions. As urban residents tend to have shorter work commute times and live in closer proximity to each other and treatment facilities, a program like A-CRA would be suitable in an urban community. Plus, the program aims to increase youths’ involvement in prosocial recreation and informally relies on staff members at recreational facilities to help and encourage the youths’ participation (Godley et al., 2001). Again, the close proximity and abundance of recreational programs in urban areas facilitates the implementation of community-based treatment approaches.

**Predictive Validity of the PACT**

Two of the most important findings of the current study are, first, that the PACT’s ability to predict recidivism is stronger in urban areas than in rural areas for moderate and moderate-high risk youths. In other words, high risk youths are more likely to recidivate than moderate risk youths, but only in urban areas. In rural areas, high risk youths had no greater odds of
recidivating than moderate risk youths. This inconsistency was found again for moderate risk youths: moderate risk youths were more likely to recidivate than low risk youths, but only in urban areas. Moderate risk youths in rural areas had no greater odds of recidivating than low risk youths. The second important finding is that the PACT’s ability to predict time to recidivism was stronger and in the expected direction in urban areas, but not in rural areas. In urban areas, youths rated as higher risk recidivated quicker, but in rural areas, the PACT did not predict time to recidivate.

These findings are very important in terms of the way that youths are sanctioned which is, in part, dependent on PACT risk level. FDJJ uses a disposition matrix by which the restrictiveness of the supervisory placement increases in proportion with the risk level. Low risk youths might not be adjudicated but assigned to diversion programs. If they are adjudicated, then, according to the matrix, they remain in the community with minimal supervision. Moderate risk and moderate-high risk youths are placed in more structured community programs and receive intensive probation supervision. High risk youths can be placed in residential facilities when adjudicated, the most restrictive of sanctions (Baglivio & Russell, 2014). A critical implication of the current study’s findings is that for rural youths, those rated by the PACT as high risk could be placed in residential facilities even though they have no greater odds of recidivating than moderate risk youths who would likely be allowed to remain in the community under probationary supervision. Imposing sanctions that are too harsh could lead to negative consequences such as increased odds of recidivism. The same could happen for rural youths rated as moderate risk. They would likely be sanctioned to probation, even though they have no greater odds of recidivating than low risk youths who would likely be allowed to remain in the
community under minimal supervision or diverted out of the system altogether. Again, over-sanctioning can negatively impact the youth and the community.

Because higher-risk youths are often the target of treatment programs and are allocated more juvenile justice (Andrews & Bonta, 2010), it is essential that a juvenile risk assessment instrument accurately discriminates across risk levels for as many youths as possible, regardless of community type, especially in Florida where disposition restrictiveness is based on risk level. The “misdiagnosis” of risk level or time to recidivism could result in treatment that is too intense or too long, which could potentially increase the youths’ likelihood of recidivating (Gatti et al., 2009). Walsh and Weber (2014) found that low-risk youths exposed to excessively long or intense treatment had higher rates of recidivism than youths who were matched with more suitable treatment programs to address problematic behaviors. When the low-risk youths’ treatment was adjusted and tailored to better match their risk level, their recidivism rates dropped from 39.0% to 30.5%. In addition, over-sanctioning a youth, who in actuality, has a low risk of recidivism but scored high on the instrument, could expose the youth to the negative impacts of labeling, such as reluctance to seek help in the future (Lemert, 1951; Smith et al., 2002).

Conversely, under-sanctioning a youth who has a high risk of recidivism but scored low on the instrument, could have much more detrimental consequences. First and foremost, the youth might pose a threat to the community or to himself or herself. Without adequate supervision or sanctions, the youth’s potential to recidivate would be increased. Second, the sanction might not be enough to deter the youth from recidivating. Lastly, inaccurate prediction could result in systemic missteps such as budgeting miscalculations, staff surplus or shortage, and loss of trust in the justice system by citizens.
Alternatively, findings also suggest that the PACT may not accurately reflect risk levels among rural youths. This could be due to a number of factors including the inclusion of risk items that are not significantly criminogenic among rural youths, such as association with antisocial peers (Nelson et al., 2010), and the exclusion of risk items that accurately reflect risk level among rural youths, such as weak religiosity (Nelson et al., 2010). Both scenarios lead to misclassification of risk level among rural youths based on the use of an assessment process that does not fit with the risk/needs of rural youths. Such improper measurement can translate into missed opportunities to intervene and/or the misuse of intensive sanctions and interventions that increase the odds of poor youth outcomes. That is, accurate identification and measurement of risk level and risk factors that impact a youth’s likelihood of recidivism is essential for rural youths.

While these consequences are likely to impact any community negatively, rural areas would be particularly hurt. Rural areas already tend to have shortages, sometimes severe shortages, of effective treatment programs and qualified staff (Edmond et al., 2016; Thomas et al., 2009). If the resources that are available are being used and distributed inefficiently, then youths who most need them could be underserved. Furthermore, it is difficult to attract qualified staff to rural areas, and mismatching youths to treatment referrals could further exacerbate the unwillingness of providers to serve in those areas (Edmond et al., 2016; Pathman et al., 2004). Finally, youths from rural areas are more likely than youths from urban areas to be under- or uninsured (Smith & Medalia, 2015; Ziller et al., 2008). Court-required treatment that is unnecessary or not appropriately matched to youths’ needs could become costly for the youths and their families, creating greater disparities.
In sum, the findings of the current study suggest that the use of the PACT to make disposition decisions may be disadvantaging rural youths. If no differences in recidivism exist across risk level for rural youths, this suggests that the matrix may not accurately reflect appropriate sanctioning decisions made in rural juvenile courts. The goal of dispositional decision-making is to identify the most appropriate sanction that balances intervention and public safety. However, among rural youths, the findings suggest that public safety (i.e., recidivism) does not vary across risk levels.

**Limitations**

A major limitation of the current study is the way in which “urban” and “rural” youth were defined. The definitions were based off the U.S. Census Bureau’s definition which uses population size to distinguish between community type (U.S. Census Bureau, 2019). Though many past studies have used the Census Bureau’s definition, the current study built its theoretical framework with social disorganization and collective efficacy theories. Key components of these theories are community-level variables such as poverty, concentrated disadvantage, and number of single-parent families. The current study relied on bivariate analyses and, as such, did not examine individual community-level characteristics typical of urban and rural areas. Thus, claims about social disorganization and collective efficacy were based on findings of past studies regarding how rates of such characteristics vary across community type. Furthermore, factors other than community type that could be related to the study variables (e.g., current and prior offenses) could not be examined using bivariate analyses. The lack of multilevel analyses also precluded consideration of the nested nature of the current study’s data (youth nested in zip codes). Without more sophisticated analyses, this study could not draw conclusions regarding
which community and youth characteristics influence risk level, types and levels of specific risk domains, and PACT predictive validity.

Another limitation of this study is the use of zip codes as a geographical unit of analysis. Zip codes were not designed to represent well-defined areas but are rather collections of postal delivery routes. Zip code areas might have irregular boundaries, or boundaries that encompass both urban and rural areas (Forrest, 2019). Using zip codes as the unit of analysis may mask effects of urbanity or rurality that are taking place on a smaller geographical scale. For example, since zip codes represent delivery routes and might have irregular boundaries, a zip code area that is classified as “rural” based on its population count may encircle a central business district, much like a commuter beltway circles a downtown. The characteristics of that rural zip code might be much more reflective of urban rather than rural community characteristics.

As with most studies using administrative data, inferences made from the data are potentially limited by the quality of the data. Administrative data may be missing items or may include items that were inaccurately recorded. For example, the criminal history and social history sub-scores generated by the PACT were not provided by FDJJ. Only the individual risk domain scores and the overall PACT risk score were included. Also, the severity of the current offense was not a variable in the FDJJ data. Furthermore, the inter-rater reliability of the instruments used to gather data is unknown due to the subjective nature of some portions of the instrument. The PACT is administered as a semi-structured interview and administrators must use professional judgement when scoring some of the items. Though PACT administrators receive training on interviewing techniques, it is still possible that personal biases could be introduced in the scoring process. In addition, the self-report component of the PACT, in which youths answer questions about their lives during a face-to-face interview, could be skewed based
on the youths’ willingness to provide honest answers and their ability to recall events and circumstances. Finally, the measurements of the various risk factors, which are used as DVs in several of this study’s hypotheses, might be limited by being “forced” to align with the definitions used in the PACT. The questions included in each PACT domain that are used to conceptualize the risk factor might not incorporate all the components typically used in the literature to conceptualize the factor. The researcher of the current study did not have any control over or input regarding the selection of questions used in each PACT domain.

Data from official records also have limitations. The sample includes only youths who were adjudicated and sanctioned to community probation. This excludes youths who engaged in delinquent behavior but were not caught or referred to FDJJ. Thus, the current study cannot examine the risk factors these youths might have experienced nor can it examine how these youths’ level or types of risk vary across community type. Relatedly, since recidivism data for the current study comes from official records, the likelihood of obtaining an accurate recidivism rate is decreased. An inaccurate measurement of recidivism could skew the percentages of youths who reoffended across community type, subsequently skewing measurements of the PACT’s predictive validity across community type.

Also excluded were youths who were not administered the PACT Full Assessment because they were pre-assessed as low risk to reoffend. Thus, the ways in which the types and severity of risk factors experienced by lower risk youths vary compared to youths who were rated at higher risk levels and given the PACT Full Assessment cannot be examined. Also, it is important to note that the findings of the current study, particularly the predictive strength of the PACT, should not be generalized to the lower risk youth in FL (i.e., who would not receive the Full Screen PACT).
Another limitation of this study is the definition of recidivism. Recidivism is defined as any new adjudications, adjudications withheld, or convictions for any new violation of law during the time that a youth is on probation or during the 12-month period after a youth was released from probation. Therefore, individuals who recidivate after the 12-month follow-up period were not included. In addition, the follow-up period began while youths were on probation which means that a portion of the follow-up period included the time youths were under close supervision. This is not true for youths in studies where the follow-up period began after they had completed probation and were no longer under such strict supervision. Likewise, individuals who moved out of the state and recidivated during the follow-up period are not included because the data only includes offenses that were adjudicated, had a withholding of adjudication, or were convicted in Florida.

Finally, the use of statewide data limits the national representativeness of this study’s findings because Florida might differ from other states in ways that significantly influence the outcome variables. For example, Florida has a higher percentage of foreign-born residents than other states, resulting in more lingual, racial/ethnic, and cultural heterogeneity. Florida also has higher rates of residential instability than other states due to the high number of tourists and part-time residents. Using statewide data also excludes youths who moved to another state during the study period. It also does not account for the ways in which FDJJ differs from other states’ juvenile justice systems. For example, FDJJ is a statewide system; other states might have county-level systems (Tafoya & Hayes, 2014). Since FDJJ is a statewide system, a single risk assessment instrument is used to assign risk levels for recidivism. These risk levels are subsequently applied to a disposition matrix for supervisory placement of youths (Baglivio & Russell, 2014). Despite these limitations, the current study contributes to the existing body of
literature on risk factors of juvenile delinquency and the predictive validity of juvenile risk assessment instruments in important ways.

**Future Research**

Based on the current study’s findings and limitations, suggestions for future research will be discussed in this section. The most pressing research needs are for more PACT validation studies, especially in rural communities, since the AUC effect size from the current study showed weak to moderate predictive validity, and the AUC scores of prior studies ranged from .58 (Baglivio & Jackowski, 2013) to .62 (Early et al., 2012), which do not indicate a robust predictive ability.

The current study relies on bivariate analyses which restricts the examination of factors other than community type that could be related to the study variables (level and type of risk, PACT predictive validity, and time to recidivism). Future multivariate studies that account for important legal (current offense) and extra-legal (race/ethnicity, gender) factors might provide a more detailed understanding of how risk varies across urban and rural communities, while accounting for robust correlates of risk and recidivism. Additionally, multilevel modeling techniques would expand on the current findings by accounting for the nested nature of the data (youth nested in zip codes) while also including community characteristics as level-2 predictors. This type of analysis would provide valuable information regarding which community and youth characteristics influence risk level, types and levels of specific risk domains, and PACT predictive validity. Multilevel models are necessary to parse out and examine the various components of social disorganization (e.g., poverty, concentrated disadvantage, single-parent homes) that could be impacting the current findings across urban and rural communities.
Due to the paucity of research regarding rural delinquency and risk factors for delinquency and recidivism, further research is needed in rural areas. Based on the current study’s findings, whether a youth lives in an urban or rural area is significantly related to the level and types of risk factors to which he or she is exposed. Further research is needed to identify which community characteristics, if any, in each community type are associated with delinquency and risk factors for delinquency. Moreover, the current findings show that though urban youths are more likely than rural youths to be rated at a higher risk of antisocial behavior, the time to recidivism did not significantly vary across community type. Further research is needed to examine why urban youths have a higher likelihood of initially engaging in antisocial behavior, but, when it comes to recidivism, are no more likely than rural youths to reoffend.

Analyses are needed to determine whether rates of social disorganization are still higher in urban areas, especially considering changes in the economic, social, and political realms that occur over time. If the gap between rates of social disorganization in urban and rural areas is narrowing, then the impact on levels of collective efficacy across urban and rural areas should be examined, as well as the mechanisms that connect collective efficacy to risk for recidivism, RNR principles, and offender recidivism. With the possibility of changing characteristics of urban and rural communities, there is a chance that the influence of collective efficacy has grown stronger in urban areas, or, conversely, weaker in rural areas. Future research could also address the question of whether urban areas have unexamined protective characteristics that may decrease risk factors, or if rural areas have unexamined characteristics that increase risk factors. For example, perhaps the dense populations typical of urban areas make it more difficult for youths to encounter risk factors, or to be detrimentally impacted by them, because there are frequently
people around to intervene. This could explain the lack of significant differences in urban and rural mean PACT scores for five of the eight types of risk measured in the current study.

Based on the limitations of the current study, future research is needed to continue to examine the relationship between risk factors for delinquency and community type, as well as the predictive validity of the PACT (and other juvenile risk assessment instruments) and time to recidivism across community type. Geographic units other than zip codes, such as Census tracts, could be used to analyze community-level effects of social disorganization on youths’ exposure to or influence from risk factors for delinquency. A tract-level study could, for instance, explore components like relative poverty and its impact on youths who live in lower-income tracts that are adjacent to affluent tracts. Qualitative studies need to be done to probe for information not included in official records. Self-reported delinquency often differs from official reports. Moreover, the sensitive nature of some risk factors, such as family problems, might be better addressed in a more personal, qualitative setting. Qualitative studies would also alleviate the limitations of using administrative data. Further research needs to be done on how risk factors for delinquency and recidivism vary across urban and rural areas in states other than Florida.

Finally, further research is needed to examine how the effectiveness of treatment programs could be increased based on differences in types of risk across urban and rural communities. Urban youths were rated at higher risk levels than were rural youths for past antisocial behavior, currently having antisocial peers, and currently having substance abuse problems. Future research in urban areas could prioritize program evaluations of interventions and treatments that focus on these three risk factors. Additionally, youths’ scores for types of risk did not vary as much as expected across community type, indicating that rural areas, which have
been largely ignored by past research, have as great a need for research regarding treatment and program evaluations as urban areas.

**Conclusion**

Two key takeaways can be gleaned from the current study. First, most of the PACT risk domains were found to be similar across urban and rural youths. This finding suggests that most intervention programs should work similarly, regardless of community type. Second, and most importantly, the results of this study suggest that rural youths may be disadvantaged in the juvenile justice system due to lack of predictive ability of the PACT. Rural youths could be over-sanctioned based on inaccurate risk assessments. The consequences of over-sanctioning can be detrimental. The current study appears to be the first to analyze this, but, as discussed previously, has its own set of limitations. It is imperative that FDJJ policymakers and researchers address this issue to ensure that fair and equitable decision-making occurs across the state, regardless of community type. To accomplish this, future research should seek to apply multivariate and multilevel analyses, as well as qualitative research, to account for potential legal and extralegal individual and community-level factors.
APPENDIX: UCF IRB
November 6, 2019

Dear Kelly Vannan:

On 11/6/2019, the IRB reviewed the following protocol:

<table>
<thead>
<tr>
<th>Type of Review:</th>
<th>Initial Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title of Study:</td>
<td>Examining Risk Factors of Juvenile Delinquency and the Predictive Validity of a Juvenile Risk Assessment Instrument Across Urban and Rural Communities</td>
</tr>
<tr>
<td>Investigator:</td>
<td>Kelly Vannan</td>
</tr>
<tr>
<td>IRB ID:</td>
<td>STUDY00001137</td>
</tr>
<tr>
<td>Funding:</td>
<td>None</td>
</tr>
<tr>
<td>Grant ID:</td>
<td>None</td>
</tr>
<tr>
<td>IND, IDE, or HDE:</td>
<td>None</td>
</tr>
</tbody>
</table>

Documents Reviewed:  
- IRB Advisor Form, Category: Faculty Research Approval;  
- Request for NSHR Determination, Category: IRB Protocol;  
- Vannan List of Variables, Category: Other;

The IRB determined that the proposed activity is not research involving human subjects as defined by DHHS and FDA regulations.

IRB review and approval by this organization is not required. This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made and there are questions about whether these activities are research involving human in which the organization is engaged, please submit a new request to the IRB for a determination. You can create a modification by clicking Create Modification / CR within the study.

If you have any questions, please contact the UCF IRB at 407-823-2901 or irb@ucf.edu. Please include your project title and IRB number in all correspondence with this office.

Sincerely,
Racine Jacques, Ph.D.
Designated Reviewer
STUDY000001137 has been closed

irb@ucf.edu <irb@ucf.edu>
Mon 2/2/2021 4:48 PM
To: Kelly Vannan <kvannan@Knights.ucf.edu>
Template: IRB_A_ContinuingReview_Closed

Notification of Closure

To: Kelly Vannan
Link: STUDY000001137
P.I.: Kelly Vannan
Title: Delinquency Across Urban and Rural Areas
Description: The study has been closed. To review additional details, click the link above to access the project workspace.
LIST OF REFERENCES


http://www.jstor.org/stable/3053937


http://www.djj.state.fl.us/Search?q=pact%20pre%20screen


https://towardsdatascience.com/stop-using-zip-codes-for-geospatial-analysis-ceacb6e80c38


doi:10.1080/15377930903143544


http://www.apa.org.ezproxy.net.ucf.edu/journals


http://dx.doi.org/10.1037/a0039480


