SUBSTANCE USE AMONG ADOLESCENTS: A COMPARISON BETWEEN NATIVE BORN AND NEW AMERICAN STUDENTS

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ABSTRACT

Currently, there is a lack of research within the social bond and social capital theory literature on the effects that immigration status has on substance use behaviors. The purpose of the current study is to fill this void in existing research by examining the individual and combined effects that immigration status and social capital have on adolescent substance use. To examine this, survey results from a Midwestern school district are used. Overall, the results indicate that when examining immigration and social capital measures, immigration status only predicts substance use—not frequency of use. Additionally, interaction effects indicate a significant interaction between school social capital and immigration status suggesting that when assessing substance use behaviors, native born adolescents are more affected by lower school social capital compared to recent immigrant groups.

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CHAPTER I: INTRODUCTION

Based on the data gathered by the National Institute on Drug Abuse, substance use among adolescents aged 12-17 has decreased between 2014 and 2015 (National Institute on Drug Abuse, n.d.). For this group, reported use of alcohol in the month prior to the survey shifted from 11.5% in 2014 to 9.6% in 2015. Reported rates of cigarette and marijuana/hashish use also dropped slightly from 4.9% to 4.2% and 7.4% to 7.0% respectively. These rates demonstrate that overall substance use is relatively low among adolescents and that use is declining in the United States.

While overall rates are fairly low for adolescent substance use, the statewide results for the 2015 Youth Risk Behavioral Survey (YRBS) suggest that North Dakota rates may be slightly higher. The YRBS is a survey created by the Centers for Disease Control and Prevention to assess health risk behaviors (Baesler, n.d.). Among the high schoolers in North Dakota who participated, 11.7% reported smoking a cigarette within 30 days prior to taking the survey (Baesler, n.d.). Usage rates were higher for alcohol consumption (30.8%) and marijuana (15.2%). Reported use among the middle school students surveyed reveal lower rates than the state average. In total, 3.6% of North Dakota middle schoolers reported cigarette use within the 30 days prior to survey administration.

Social Bond Theory and Social Capital

Social bond theory is a type of social control theory that was developed by Travis Hirschi in the late 1960's (Hirschi, 1969). Through social bond theory, Hirschi attempts to explain why people refrain from engaging in crime by assessing four elements of the social bond: attachment, commitment, involvement, and belief. These elements refer to interpersonal relationships between people (attachment), the devotion to and time spent in conventional activities (commitment and involvement respectively), and agreement with cultural norms and values

(belief). Altogether, Hirschi's social bond theory predicts that individuals who have stronger social bonds will be more likely to refrain from crime.

The concept of a social bond, as discussed in social bond theory, overlaps heavily with the concept of social capital. Within both social bond and social capital, a variety of social elements are merged to create an index of how connected and invested a person is to society. In addition to the similarity between these concepts, both argue that there is value in the relationships between people (Hirschi, 1969; Putnam, 2000). For example, in Coleman's (1990) discussion of social capital, he states that "social capital is productive, making possible the achievement of certain ends that would not be attainable in its absence" (p. 302). This is similar to the argument that Hirschi makes in social bond theory, that stronger social bonds will be related to higher rates of abstinence from crime.

However, while social bond theory specifically examines criminal behavior, social capital theory has been used to address a variety of social issues including behavioral issues, educational barriers, and at-risk behaviors (Adler & Kwon, 2002; Teachman, Paasch, & Carver, 1996). Social capital theory has also been used to explain substance use among adolescents. Numerous researchers have found a significant negative relationship between social capital (including family, community, school, and peers) and substance use among adolescents (Broh, 2002; Brook, Nomura, & Cohen, 1989; Guo, Hill, Hawkings, Catalano, & Abbott, 2002; Johanson, Duffy, & Anthony, 1996; Teachman et al, 1996; Winstanley et al, 2008).

While social capital theory has been used to address the issue of substance use among adolescents, currently little research has used social capital to explain differing rates of substance use between populations, specifically immigrant populations. For example, research has indicated that newer immigrants are less likely to engage in substance use than second- and

third- generation immigrants (Bui & Thogniramol, 2005; Buriel, Calzada, & Vasquez, 1982). Research has also indicated that immigrant and native-born adolescents have differences in their accumulation of social capital. For example, an Israeli study found that immigrant and native-born adolescents reported differences in their level of social capital within the school as well as differences in social capital within the family (Walsh, Harel-Fisch, & Fogel-Grinvald, 2010). And while Walsh, Harel-Fisch, & Fogel-Grinvald (2010) indicate that social capital may affect substance use differently between the two groups, little research has examined this relationship.

The current study attempts to bridge this gap in literature by examining the relationship among immigrant status, social capital, and substance use. The research questions for this study then become (1) are higher levels of social capital related to lower levels of substance use?, (2) do social capital and immigration status influence substance use?, and (3) do different areas of social capital (family, school, community, and peer) influence substance use differently among native-born and immigrant adolescent students? These questions are further examined in the current study.

Substance Use Among Immigrant Adolescents

Overall, substance use among adolescents has slowly declined in the United states. Based on the 2015 data collected by the National Institute on Drug Abuse, 9.6% of high school students reported consuming alcohol in the month prior to the survey (National Institute on Drug Abuse, n.d.). The reported rates for cigarette and marijuana use were slightly lower: 4.2% and 7.0% respectively.

However, it does appear that rates of substance use vary based upon length of residency in the United States. In a study conducted by Buriel et al (1982), which examined substance use among immigrant groups, results indicate that more established immigrant groups (those who have resided in the United States for longer periods of time) have higher rates of substance use

than more recent immigrants. This finding indicates that substance use among native-born adolescents may be higher than the rates of use among immigrant adolescents.

Based on the assumptions made within social capital theory, since recent immigrant groups have lower levels of substance use, they should have higher levels of social capital; however, some research provides information to the contrary. For example, Blake, Ledsky, Goodenow, and O'Donnell (2001) found that among youth, recency of immigration had a significant, positive relationship with social capital, indicating that youth who have lived in the United States for less time report lower levels of social capital. This indicates that there is a difference between the levels of social capital between the two groups, with recent immigrants having lower levels of social capital.

Another explanation for these differences within a social bond/social capital framework may be that there are differences within the type of social capital attained by native-born versus new immigrant students. Yet, research is inconsistent when assessing whether or not different areas of social capital (family, community, peer, school) influence delinquency differently among native-born and immigrant adolescent students. Walsh et al (2010) found that among immigrant youth, school and family social capital were stronger predictors of engagement in risk behaviors when compared to native-born youth. However, Fredrich and Flannery's (1995) research does not indicate any differences between native-born and immigrant adolescents in how social capital influences delinquent behaviors. The current study will attempt to clarify this relationship between types of social capital (family, community, peer, school) and substance use among native-born and new immigrant adolescent students.

Purpose

The purpose of the current study is to attempt to explain differences between native-born and immigrant adolescent rates of substance use. This study will be done by examining

differences in levels of social capital among these two groups. To explore this relationship, a sample of 6-12th grade students in a Midwestern city will be surveyed. Social capital will be determined by examining four types of social relationships: family, community, peer, and school. To determine the strengths of these relationships, a series of questions will be used to assess the level of time spent with members of each group (involvement), as well as levels of communication and support. Substance use behaviors will be measured through self-report as well. This category will assess alcohol consumption, tobacco use, marijuana use, and misuse of prescription medicines. This understanding of how individual differences affect social capital, further insight can be gained regarding how student needs can be met within the school and community.

Research Questions

1. Are higher levels of social capital related to lower levels of substance use?
2. Do social capital and immigration status influence substance use?
3. Do areas of social capital (family, community, peer, school) influence substance use differently among native-born and immigrant adolescent students?

CHAPTER II: A REVIEW OF THE LITERATURE

Chapter II is a review of the current literature on substance use behaviors among adolescents. This section consists of a discussion of substance use among adolescents and how it relates to Hirschi's Social Bond Theory and social capital.

Substance Use in Adolescence

For the purposes of this study, the discussion of substance use will focus on four types of substances: tobacco, alcohol, marijuana, and prescription drugs. The following sections will discuss the prevalence of each of the aforementioned substances.

Tobacco

Based on the data gathered by the National Institute on Drug Abuse (NIDA), substance use among adolescents between the ages of 12 and 17 has decreased between 2014 and 2015 (National Institute on Drug Abuse, n.d.). For this group, reported use in the past month for cigarette smoking shifted from 4.9% to 4.2% between 2014 and 2015. For smokeless tobacco products, use also declined from 2.0% to 1.5% respectively.

While the overall rates of cigarette use were higher among adolescents in North Dakota; North Dakota adolescents reported a similar decline in tobacco use in the Youth Risk Behavior Survey (YRBS). The YRBS is a survey created by the Centers for Disease Control and Prevention which is conducted every other year to assess health risk behaviors (Baesler, n.d.). Among the high schoolers in North Dakota who participated, 11.7% reported smoking a cigarette within 30 days prior to taking the survey in 2015, compared to 19.0% in 2013 (Baesler, n.d.). This was lower still among middle school students, of which 4.2% and 3.6% students reported cigarette usage in 2013 and 2015 respectively. Smokeless tobacco use among North Dakota adolescents was also higher than the national rate. Among high schoolers, 13.8% of students

reported smokeless tobacco use in 2013 compared to 10.6% in 2015. These rates were 3.5% and 2.9% respectively for middle school students.

In addition to statewide data, local data for the two high schools involved in the current study were also available from the YRBS 2015. In the first high school, 9.0% of students reported smoking cigarettes in the 30 days prior to taking the survey; however, when examining all tobacco use, this percentage increased to 26.6% of students. For the second school involved in the current study, 2015 YRBS data indicate that 2.3% of students smoked cigarettes while 20.5% used any form of tobacco product.

Alcohol

A national survey assessing adolescent (12-17-year-olds) rates of alcohol consumption found that 9.6% of adolescents surveyed in 2015 reported consuming alcohol in the past month (National Institute on Drug Abuse, n.d.). This represents a 1.9% decrease from the rate reported in 2014.

Similar to the rates of tobacco in North Dakota, alcohol usage among adolescents in the state were higher than the national estimates. Among high school students, in 2015, 30.8% of students who participated in the YRBS survey reported consuming alcohol in the 30 days prior to taking the survey compared to 35.3% in 2013 (Baesler, n.d.). This data was not collected in the YRBS survey for adolescents in middle school.

Self-reported rates for alcohol consumption were also available for the two high schools included in the current study. According to the 2015 YRBS data, 24.1% of students at the first high school, and 24.9% of students at the second high school reported consuming alcohol in the last 30 days. This is slightly lower than the North Dakota state average, but remains higher than the national rate.

Marijuana

For marijuana use, the national survey conducted by NIDA found that in 2015, 7.0% of adolescents between the ages of 12 and 17 reported use in the last month (National Institute on Drug Abuse, n.d.). This represents a slight decrease from the rate reported in 2014 (7.4%).

Among adolescents in North Dakota, 15.2% of high schoolers who completed the YRBS survey reported marijuana use in 2015 compared to 15.9% in 2013 (Baesler, n.d.). Marijuana use was not assessed among middle schoolers in the YRBS survey.

YRBS data from 2015 also provide an indicator of marijuana use at the high schools involved in the current study. For the first high school included in this study, 16.9% of students reported using marijuana in the last 30 days. A slightly lower rate, 13.2%, was reported at the second high school.

Prescription Drugs

Unlike the other substance use measures, the YRBS doesn't assess past 30-day use for prescription drug misuse. Instead, they examine misuse at any point in the adolescent's lifetime. Based on the North Dakota YRBS data, in 2015, 4.4% of high school students who participated had taken prescription drugs without a doctor's permission during their lifetime (Baesler, n.d.). This rate was 5.0% in 2013 indicating a slight decrease in prescription drug misuse.

Similar to the rates of other substances, prescription drug use was higher at the two high schools involved in the current study as well. Based on 2015 YRBS data, 16.6% of students at the first high school and 15.5% at the second high school reported taking prescription drugs without a doctor's prescription in their lifetime.

Substance Use Among Immigrant Groups

Overall in the United States, substance use among adolescents appears to be relatively low, and slowly declining (National Institute on Drug Abuse, n.d.). Research also indicates that

substance use is lower among certain groups, such as first-generation immigrant populations. This may indicate a relationship between length of residency and substance use.

Buriel et al (1982) assessed differences in delinquency (including a measure of substance use) among first-, second-, and third-generation Mexican-American immigrants. They found that delinquency was significantly higher among third-generation immigrants when compared to first- and second-generation immigrants, indicating that immigrants with shorter residency in the United States are less likely to engage in delinquent behaviors (including substance use).

Similar results were found in a later study conducted by Bui and Thogniramol (2005). Overall, this research study found that delinquency has a positive relationship with immigrant generation indicating there are higher levels of delinquency among third-generation immigrants; however, the strength of these relationships vary slightly based on gender, racial, and ethnic groups.

Social Bond Theory

Social bond theory was developed by Travis Hirschi in *Causes of Delinquency* (Hirschi,1969). Social bond theory is a part of a larger group of criminological theories—control theories. Control theories attempt to explain why individuals refrain from involvement in crime by exploring individual ties to conventional society. Overall, the general premise of social bond theory is that individuals who have weak ties to society are more likely to engage in crime. Social bond theory examines four elements that make up an individual's bond to society: attachment, commitment, involvement, and belief.

Attachment refers to the interpersonal relationships with other conventional people. In *Causes of Delinquency*, Hirschi (1969) notes three primary areas of which these attachments may develop: among parents, the school, and peers. Social bond theory then proposes that individuals who have strong attachments with conventional parents, schools, and peers are less likely to

engage in deviant behaviors. A lack of these attachments, on the other hand, is related to an increased risk of engaging in deviance.

Commitment is the energy that a person invests into conforming to conventional norms. Engaging in afterschool programming and spending time on homework for example, represents a commitment to school and education. This introduces an element of rationality to the social bond theory. The idea is that individuals who are more committed to conventional activities will be less likely to engage in deviant behaviors because there are more potential costs to deviancy compared to individuals who have less commitment to conventional norms.

Involvement is the third element and refers to the time spent engaging in conventional activities. This concept relates to the idea that time is limited; thus, individuals who spend more time involved in conventional activities will be less likely to engage in delinquent behaviors because they have less time/opportunity to do so.

The final element of social bond theory is belief. Belief refers to the degree to which an individual agrees with the cultural rules and values. This assumes that not all members of society share the same overarching values; instead, there is variation in the extent to which individuals agree with social norms, values, and rules. Social bond theory predicts that individuals whose values are consistent with those of the broader societal values will be less likely to engage in deviant behavior than people whose values are inconsistent with those of the broader society.

Hirschi (1969) identifies these four primary elements through which people form a bond to society (attachment, commitment, involvement, and belief); however, he notes that these elements are not in isolation from one another. On the contrary, Hirschi (1969) argues that they are highly interrelated with one another. That is, in general, these elements of social bonds tend

to vary together. For example, an individual who has higher levels of attachment to conventional people is likely to have higher levels of commitment as well.

Overall, the concept of a social bond shares a variety of similar principles with social capital. Social capital is the idea that there is a value in the relationships that a person has with their friends, family, and associates (Woolcock & Narayan, 2000). Thus, social capital is created through the relationships formed between two or more people. These relationships form an asset that can be used and leveraged by an individual. As Coleman (1990) states, "social capital is productive, making possible the achievement of certain ends that would not be attainable in its absence" (p. 302). In this sense, the concept of social capital is similar to the concept of social bonds presented by Hirschi's social bond theory as they both serve a function at an individual level. While Hirschi's concept of the social bond forms a sense of conformity within an individual serving to reduce deviance, social capital serves a variety of functions including completion of high school, economic stability, increased job attainment, reduced substance use, fewer behavioral issues, and reduced juvenile crime/delinquency (Adler & Kwon, 2002; Arthur, Hawkins, Pllard, Catalano, & Baglioni, 2002; Dufur, 2001; Furstenberg & Hughes, 1995; Pleydon & Schner, 2001; Simons-Morton, Haynie, Crump, Eitel, & Saylor, 2001; Teachman, et al, 1996).

Social bonds and social capital are also both dependent upon society. In other words, neither a social bond nor social capital can be developed without other people. In Hirschi's social bond theory, the concepts of attachment, commitment, and investment are each intertwined with people and structures within society. Due to the interrelatedness of the elements of social bonds, an individual's beliefs may also vary in relation to the development of these elements. Similarly, a distinctive characteristic of social capital, compared to other forms of capital, is that it is a

collective property (Croinger & Lee, 1996; Putnam et al, 2004). While one's access to social capital can vary among individuals, it remains a group characteristic and cannot be obtained by one individual on their own.

In addition, similar to Hirschi's (1969) discussion of the interrelatedness of the elements of a social bond, Coleman (1988) also contends that social capital is not a single entity; instead, social capital is comprised of a variety of social relationships, including "obligations and expectations, information channels, and social norms" (p. 95). Thus both social bonds and social capital are comprised of an array of similar elements. While social capital has no uniform definition, several researchers have identified the elements that make up this concept; these include trust, rules and norms, and the types of social interactions being made (Coleman, 1988; Fukuyama, 2001; Kawachi, Kennedy & Glass, 1999; Kilpatrick, 2000; Leana & Van Buren, 1999; Lemmel, 2001; Portes & Sensenbrenner, 1993; Putnam, 1993; Snijders, 1999). These elements are consistent with those Hischi identified in social bond theory. For example, in social bond theory, Hischi argues that one element in the social bond is attachment to conventional others. Social capital also emphasizes these relationships between a person and their family/parents, peers, school, and community. Similarly, both the concept of social bond and social capital highlight the importance of engaging in conventional activities (Hirschi, 1969; Narayan & Cassidy, 2001; Snijders, 1999).

Social Capital and Substance Use

Social capital has been repeatedly shown to have a relationship with drug and alcohol use among adolescents/young adults. The following sections will break down the relationship between substance use and social capital by examining how four areas of social capital (family, community, school, and peers) each influence usage.

Family and Substance Use

Various aspects of family social capital have been linked to the development of youth. For example, Furstenberg and Hughes (1995) examined how family-oriented social capital relates to the development of at-risk youth. To measure this, Furstenberg and Hughes (1995) assessed a variety of within-family characteristics in their survey, including parental support, parental involvement in school activities and homework, time spent with the family, and the amount of encouragement received from parents. The results of this study indicated that higher levels of social capital within the family structure is related to higher rates of high school graduation, job attainment, and a stable economic status among at risk youth. A separate study by Parcel and Dufur (2001) assessed the effects of family social capital on youth school achievement. These results indicate that a positive home environment and low maternal work hours were both significantly related to math achievement scores. A positive home environment and low maternal work hours related to social capital by providing a more supportive environment for children and increasing time spent between parents and children. While family social capital appears to influence several areas of development; there has been ample research examining the relationship between areas of family social capital and substance use specifically.

Parental involvement is one area of familial social capital that has been studied. One example of this is Teachman et al's (1996) assessment of the relationship between familial characteristics on youth social capital. The results of this study indicate that higher levels of parental interaction have a significant positive relationship with high school completion among youth. However, these interactions also relate to substance usage. Guo et al (2002) found a significant negative relationship between youth drug use and family bonding, indicating that youth who reported higher levels of family bonding, reported lower levels of drug use. When examining parent-child relationships and their connection with youth drug use, Simons-Morton

et al (2001) found that children whose parents are more involved in their life were less likely to report cigarette and alcohol use. Simmons-Morton et al (2001) also found that parental expectations of children were related to substance abuse as well. This finding indicates that children whose parents communicated clear expectations on substance use were less likely to report cigarette and alcohol use on the survey. Curran's (2007) study also supports this relationship. This evaluation assessed the relationship between social capital and substance use among ninth to twelfth grade students. Overall, Curran (2007) found that parental expectations and rules, as well as family connectedness, were all significantly related to alcohol use among teens.

Community and Substance Use

The literature examining the relationship between community social capital and substance use among adolescents has largely focused on community involvement. According to Nettles and Greenberg (1990), "community involvement consists of the actions that organizations and individuals take to promote student development" (p. 4).

To examine the relationship between community social capital and substance use, Winstanley et al (2008) measured social capital through community involvement measures. These measures include engagement in community groups such as 4-H clubs, boy/girl scouts, Big Brother/Sister, church choir, Youth centers, and involvement in team sports as well as time spent volunteering. Each of these community involvement measures had a significant inverse relationship with drug and alcohol use among adolescents.

Johanson et al (1996) examined how a specific area of community involvement affects drug use in adolescents. To do this, Johanson et al (1996) assessed participation in church functions. The results of this study indicate that adolescents who engage in church functions two or more times per week are less likely to be involved in drug use. This finding is consistent with

the hypothesis that higher levels of community involvement are related to lower rates of substance use (Arthur et al, 2002). Arthur et al (2002) found similar results, concluding that "neighborhoods where youths report low levels of bonding to the neighborhood have higher rates of juvenile crime and drug use" (p. 579).

School and Substance Use

School-based social capital may also influence substance use among adolescent students. One method of examining this relationship is through assessing the relationship between involvement in school and subsequent substance use. Similar to how community involvement has been studied, research on school involvement has typically focused on participation in school activities.

To assess this relationship, Winstanley et al (2008) examined the relationship between school involvement and drug and alcohol use. Due to limitations with the survey content, Winstanley et al (2008) focused specifically on three areas of school involvement: student government, school clubs, and school band. The results of this study indicate that there is an inverse relationship between school involvement and drug and alcohol use, meaning that students who were more involved with the school had lower rates of drug and alcohol use than students who had lower rates of involvement.

School involvement may effect more than just substance use among adolescents. For example, when examining extracurricular involvement in school athletics, Broh (2002) found that participation in these activities was related to higher overall social capital among youth. Students involved in athletics tended to have stronger bonds with both their parents and their school when compared with those students who did not participate in these activities.

In addition to the various ways school involvement is related to substance use, it may also be, that much like community involvement, the option of student involvement is related to

substance use. In Arthur et al's (2002) assessment of social capital variables and adolescent substance use, the researchers found support for this idea. Overall, their results indicate that adolescents who perceived there to be more opportunities to get involved in the school were less likely to report drug use; although, this may be a spurious relationship due to actual participation in school activities. For example, students who perceive there to be more opportunities to participate may be involved in more school activities than students who perceive there to be fewer opportunities to participate in the school.

It also appears that school social capital can affect substance use at a broader level, rather than purely on an individual level. This relationship is reflected in a study by Weitzman and Chen (2004) that examined college-wide rates of social capital. This study found that social capital measured at an aggregate (school wide) level was related to alcohol use among undergraduate students. To study this relationship, Weitzman and Chen (2004) measured social capital at an aggregated level by examining mean of volunteer hours within the school. They found that students attending colleges with higher levels of social capital reported lower rates of alcohol consumption and abuse.

Peers and Substance Use

The final area of social capital that will be discussed in relation to substance usage among adolescents is peer relationships. According to Benard (1990), peer relationships are crucial to the social development of children. These interactions are imperative because they contribute to the learning of attitudes, values, social skills, and identity among youth. Since these interactions are more frequent than the other types of interactions that children have, peer relationships are a crucial piece of youth development.

While Pleydon and Schner (2001) do not examine substance use explicitly, they do evaluate delinquency on a broader scale in relation to levels of peer social capital. The results of

this study indicate that lower levels of communication among peers is significantly related to delinquency among female students; however, this relationship was not significant among male students.

Brook et al (1989) also examined the relationship between peer relationships and drug use. In this study they found that students with more high achieving friends (friends who got A's and B's grades in school) were less likely to report substance use. When comparing this relationship to those between youth and the family, community, and school, research indicated that the relationships between youth and their peers and family were directly related to substance use. While neighborhood and school factors were still significant in the models, they influence substance use less directly by influencing the family and peer relationships. This is consistent with Bernard's (1990) hypothesis that peer relationships are one of the most influential in development.

Social Capital Among Immigrant Adolescents

According to the data collected by the Department of Homeland Security, in 2014, 69,975 refugees were permitted entrance into the United States (Department of Homeland Security, 2016). Total, the U.S. immigrant population consisted of 42.4 million people; comprising 13.3 percent of the total U.S. population (Zong & Batalova, 2016). In addition to this, one recent study also approximated that there are around 11.4 million unauthorized immigrants living in the United States (Baker & Rytina, 2013).

Before discussing current literature on the differences between native-born and immigrant levels of social capital, a few barriers to the development of social capital among immigrant populations will be discussed. Eckstein (2010) identified several potential barriers to maintaining social capital among immigrants entering the United States; particularly, this research centers on the examination of Cuban immigrant populations. One barrier is the

governmental restrictions that regulate visits and trade with Cuba. This can impact an individual's ability to maintain strong bonds with their family and friends living in Cuba. Informal barriers, however, can also hinder the development of social capital among immigrants. These barriers can occur through the stigmatization, economical disadvantages, and violence that immigrants may face on American soil.

Eckstein's (2010) study suggests that immigration may affect levels of social capital at an individual-level; however, immigration rates may also affect levels of social capital at a macro-level. Kesler and Bloemraad (2010) attempted to examine the effects that the immigration rates of a country have on social capital. In an analysis of several countries, the results indicate that immigration has a significant positive relationship with membership in community organizations but has an insignificant effect on political action and trust. This suggests that higher levels of immigration within a country may lead to higher levels of overall social capital. In other words, higher levels of immigration into a country can improve social capital within the nation—not just among people who have moved. To better understand the relationship between immigration and social capital, the following portion of this section will provide a review of the current literature.

Several studies have attempted to identify if differences exist between native-born and immigrant residents. Walsh et al (2010) present one example of this. In their study they assessed how parent, teacher, and peer influences affect risk behaviors among native and immigrant adolescents in Israel. Overall, native-born and immigrant adolescents reported some differences in their social support. Immigrant adolescents reported lower levels of support within their school and from their teachers as well as lower levels of monitoring from their parents. There were also differences in how these support systems affected risk behaviors among the two groups. For native Israeli adolescents, parents, teachers, and peers all had a significant influence

on risk behaviors; however, for immigrant youth, the school environment and parental support with school were the strongest predictors of engagement in risk behaviors.

Fredrich and Flannery (1995) represents a U.S. based study that examined a similar relationship. In the study, Fredrich and Flannery (1995) assessed how ethnicity affected the relationship between parental monitoring, peer pressure, and delinquency. Within both groups, parental monitoring had an inverse relationship with susceptibility to peer pressure. The predictive patterns of delinquency were also similar for both groups. Consistent with social capital theory, there was a negative relationship between parental monitoring and delinquency and a positive relationship between peer pressure and delinquency for both groups. Contrary to the findings in Walsh et al (2010), the results from Fredrich and Flannery's (1995) study indicate no differences between influences of social capital among native-born and immigrant residents.

Other studies suggest that longer residency in a country may influence social capital. Blake et al (2001) evaluated how substance use is affected by the recency of immigration among youth in Massachusetts. In this study, researchers found that recent immigrants reported having lower levels of parental support and higher levels of peer pressure to engage in substance use when compared to immigrants who had been living in the United States for longer periods.

The present study attempts to bridge the gap in social capital literature surrounding immigrant substance use. This will be done by first assessing if social capital measures are related to self-reported rates of substance use. Then, based on the social capital measures used in the current study (family, peer, community, and school), this study will determine if these areas of social capital and immigration status are related to reports of substance use. The current study will then conclude by examining how different areas of social capital (family, community, peer,

school) influence substance use differently among native-born and immigrant adolescent students.

CHAPTER III: METHODS

Chapter III will address the methodology used in the current study. This chapter will explain the three primary processes involved in the research, which include: the development of the survey, administration, and data analysis.

Development of the Survey

The survey instrument used for the current research project, the Student Social Capital Survey, was developed by a local community coalition partially for the purposes of this research. The community coalition is comprised of various sectors of the community who are interested in improving the quality of life among adolescents and reducing substance use. These members include representatives from various organizations including juvenile court, children's advocacy centers, the local police department, the public school district, religious organizations, and cultural diversity resource centers.

The Student Social Capital Survey instrument was developed specifically to measure social capital and substance use among middle and high school students. This measure includes four distinct areas of social capital development: family, community, school, and peers. The process of constructing the survey consisted of three primary steps: collecting questions, conducting focus groups, and finalizing the survey.

The first step in developing the survey was to compile a group of questions that were hypothesized to measure social capital among adolescents. To gather these questions, adolescent-directed survey instruments were gathered and sorted. From these, a list of questions that assessed social capital was constructed. The modified list of questions on the Student Social Capital Survey consisted of an assortment of questions that aim to measure four primary areas of social capital (family, community, school, and peers).

Survey questions regarding substance usage were chosen based upon specifications listed on a grant received by the coalition. These specifications identify four areas of substance use: alcohol, marijuana, tobacco, and prescription drug use. Each substance category is measured based on use in the last 30 days.

After the modified list of survey questions was compiled, the next step taken to develop the survey was to conduct focus groups among youth. Focus groups were led by a member of the coalition and consisted of student volunteers from advanced placement classes in a local high school as well as a follow-up group consisting of volunteers from a local youth drug court program. These students provided their input as to the formatting of the questions and also spoke on behalf of which factors they believed lead to success in life. This feedback was used (in conjunction with existing research) to compile a final version of the survey.

The last step in creating the survey was to generate an online edition. This step was taken for the convenience of the school district since all of the students are provided with a school issued tablet. To complete this step, the list of survey questions complete with ordering was provided to a coalition member experienced in survey development and administration, who put them into an online format.

Survey Administration

A final copy of the Student Social Capital Survey and the administration materials was provided to the Superintendent of the school district in October of 2016. These materials were then given to the principals at each of the three schools administering the survey. In November of 2016, an informational flyer was distributed in the monthly student newsletters to inform parents/guardians that a survey would be administered later in the month. Prior to administration, an additional sheet was sent home to parents/guardians. This included information regarding the

purpose of the survey, contact information to access more information, and a waiver form, that if signed and returned, would opt their child out of participation.

In late November of 2016, the Student Social Capital Survey was administered. To prepare students for the survey, teachers read a confidentiality statement. This statement included information regarding the purpose of the survey, student confidentiality, and provided a reminder that participation was voluntary. Following this statement, teachers provided the instructions for accessing the web-based survey and directions for answering the questions.

Once the survey was completed in each of the schools, the raw data were processed by a private consulting agency, hired by the coalition. A USB drive with a copy of the survey information was then provided to the current researcher. Overall, 1,663 students logged on to participate in the current study. Of these, only the high school students (grades 9-12) were used for the current study (n=944). After removing surveys that were not adequately complete (less than 80%), 904 surveys remained for the current analysis.

Measures

To address the research questions listed above, several variables are examined. The primary dependent variable for this study is self-reported substance use. Social capital and immigration status are the two independent measures used. In addition, several control variables were also included. These variables are discussed in further detail below.

Dependent Variable

The dependent variable for the current study was substance use. In order to assess substance use, the current study focused on four types of substance use: tobacco, alcohol, marijuana, and prescription drug misuse. The substance use variables were measured in two ways. The first is a dichotomous measure of the variable. This provides an indication as to whether or not students used any of the four substances in the past 30 days with a “yes” or “no”

response. Students who responded “no” to all substances assessed were coded one and any student who reported use of at least one of the substances was coded as a two. The number of cases and percent who reported substance use is presented in Table 1.

Table 1

Substance Use Items

	Number of Cases	Percent that Reported Use
28a. During the last 30 days, on how many days did you use any tobacco products (cigarettes, electronic cigarettes, vaping, chewing tobacco, cigars, cigarillos, little cigars, etc.)?	898	8.4
28b. During the last 30 days, on how many days did you have one or more drinks of an alcoholic beverage (beer, wine, liquor, etc.)? (Do not count a few sips for religious purposes)	898	11.0
28c. During the last 30 days, on how many days did you use marijuana (pot, weed, grass, etc.)?	897	9.1
28d. During the last 30 days, on how many days did you use prescription drugs not prescribed to you?	894	3.8
Total	904	15.7

The second method used to measure substance use was through a continuous variable (See Appendix A). The continuous variable regards the frequency in which students use substances. To create the continuous variable for substance use, a confirmatory factor analysis was conducted. All four of the substance use measures, tobacco, alcohol, marijuana, and prescription drugs were inputted into the model using principal components analysis and varimax rotation. The initial results demonstrate that all four items are correlated. This is confirmed by

the Bartlett's test of sphericity, which is significant (967.223, df = 6, sig = .000). The Kaiser-Meyer-Olkin test reveals a significant sampling adequacy with a value of 0.804. The principal components analysis and scree plot both indicate a single factor solution. The eigenvalue is 2.665 and it explains 66.620% of the variance. The average communality score for these variables is 0.666. In addition to the factor analysis, a reliability test was also run which revealed an alpha score of 0.82. Each of the items were then summed to create a scale with possible scores ranging from 4-24. This scale ranges from individuals who reported no use (4) to individuals who reported daily use of all four substances (24). Table 2 provides the mean, standard deviation, and range for the frequency substance use measures.

Table 2

Substance Use Scales

	Mean	Standard Deviation	Minimum	Maximum
Substance Use Frequency	4.739	2.382	4.0	24.0

Independent Variables

The current study used two primary independent variables: social capital and immigration status. Social capital was measured by these four types: family, school, community, and peer. Since social capital is a theoretical construct that cannot be easily measured by one or two questions, a confirmatory factor analysis was used in the development of each of the social capital scales. This test identifies the relationship between all of the observed variables to determine if they measure the broader construct as well as how many factors should be used to assess the latent construct. After this relationship was confirmed through the confirmatory factor

analysis, an additive scale for each of the social capital was created. Further information regarding this process can be found in the discussion of these variables.

Family Social Capital

To create a scale for family social capital variables, each of the questions assessing family social capital was examined (See Table 3). In total, ten items assessed family social capital; nine of these were formatted on a six-response Likert scale and one that took the form of a six-response scale (See Appendix B). Each of these items were inputted into a confirmatory factor analysis using principal components analysis and varimax rotation. The principal components analysis and varimax rotation were used because they utilize a technique which emphasizes the variation within the data making the dataset easier to explore. This method was useful with the current dataset as there was little variation within the social capital measures.

The Kaiser-Meyer-Olkin (KMO) measure of sampling suitability was also examined in each of the confirmatory factor analyses. The KMO index examines the correlation between items to determine whether or not the principle components analysis can act effectively. Overall, the initial correlations revealed that all the items were significantly correlated to one another, indicating that all items are related to the latent variable, family social capital, and should remain in the factor analysis. This was confirmed by the Kaiser-Meyer-Olkin measure of sampling suitability which was 0.889, indicating a strong sampling adequacy to conduct a factor analysis for these variables. The Bartlett's test of sphericity was also examined within each of the confirmatory factor analyses. This test assesses any redundancy between variables in the factor. Overall, the Bartlett's test of sphericity limits the number of variables within a factor by eliminating and items that are perfectly correlated, as if this is the case, one item is sufficient for the factor. For the family social capital measure, the Bartlett's test of sphericity indicated a

Table 3

Family Social Capital Items

	Number of Cases	Mean	Standard Deviation
12. On average, how many times a week do you eat with your family?	903	3.50	1.550
13a. My parents/guardians set clear rules for me.	903	5.07	1.005
13b. When I am not at home, one of my parents/guardians knows where I am and who I am with.	901	5.12	1.047
13c. I regularly share my thoughts and feelings with my parents/guardians.	894	3.96	1.524
13d. I enjoy spending time with my parents/guardians.	893	4.87	1.155
13e. My parents/guardians regularly talk to me about how I am doing in school.	892	4.90	1.176
13f. My parents/guardians regularly attend meetings or events at my school and activities in the community.	896	4.22	1.518
13g. My parents/guardians encourage me to do the best I can.	900	5.43	0.877
13h. I feel that my parents/guardians always care about me.	900	5.38	1.015
13i. My parents/guardians often tell me they are proud of things I have done.	899	4.96	1.255

significant Chi-Square (3612.719, df = 45, sig = .000). This indicates that the items included do not form an identity matrix and demonstrates that the items are correlated.

The principal components analysis extracted one factor with an eigenvalue of 4.78, greater than the 1.0 eigenvalue factor needed for consideration. This explains 47.8 of the variance with 0.58 being the average communality. An examination of the scree plot also indicated a single factor solution. Following this, a Cronbach's alpha was run to assess the reliability of the new scale. Cronbach's alpha is a measure of reliability of theoretical constructs and provides an estimation of how well the group of variables measure the latent construct. The Cronbach's alpha value for family social capital is 0.86, indicating a strong reliability for the measure.

The final step for creating a scale for family social capital was to sum each of the items. Each of the nine items included in the final scale utilized a six-response Likert scale format. The additive scale including means and standard deviations are listed in Table 4. The possible scores range from 10 (indicating a low family social capital) to 60 (indicating a high family social capital).

Table 4

Family Social Capital Scale

	Mean	Standard Deviation	Minimum	Maximum
Family Social Capital	49.091	8.040	10.0	60.0

School Social Capital

School social capital was created using eight items. Six of the questions were on a six-response Likert scale, one was a five-response scale, and the final question was a dichotomous

yes/no response (See Appendix C). These items were all entered into a confirmatory factor analysis using principal components analysis and varimax rotation. Based on the initial correlations, two of the variables "During the past 12 months, in how many clubs, organizations, sports, and other activities did you participate at school?" and "When I feel sad, empty, hopeless, angry, or anxious, I can talk about it with a teacher or other adult in this school." were not associated with the other variables and were excluded from further analyses. Table 5 displays the means and standard deviations for the remaining items.

Table 5

School Social Capital Items

	Number of Cases	Mean	Standard Deviation
14a. I feel valued as a person in my school.	901	4.48	1.247
14b. I feel the adults at my school care about me as a student.	902	4.65	1.129
14c. My school has clear rules, policies, and regulations that they expect me to follow.	897	5.12	0.897
14d. My school consistently enforces the rules, policies, and regulations that are in place.	900	4.62	1.190
14e. Adults at my school encourage me to be the best I can.	896	4.81	1.100
14f. I can talk to adults at my school openly and freely about my problems and concerns.	901	3.99	1.493

After removing the two items that were not associated with the others, another confirmatory factor analysis was run. The Kaiser-Meyer-Olkin measure of sampling suitability was .851, indicating a moderate sampling adequacy. Bartlett's test of sphericity was also

significant (2307.986, df = 15, sig = .000), indicating the remaining variables are correlated. The principal components analysis produced a single factor with an eigenvalue of 3.554. The school variable explains 59.22% of the variance with .59 being the average communality. In addition, the scree plot also indicates a one factor solution. A test of reliability using Cronbach's alpha indicated a coefficient of .85.

Responses for the six included questions were then summed to create a scale. This final scale ranged from 6-36, with lower values indicating a lower school social capital. The additive scale for this measure, with the mean, standard deviation, and range can be found in Table 6

Table 6

School Social Capital Scale

	Mean	Standard Deviation	Minimum	Maximum
School Social Capital	28.826	5.353	6.0	36.0

Community Social Capital

Following the same steps used for the family and school social capital variables, a community social capital variable was also created. For the initial analysis, nine items were examined including three questions on a six-point Likert scale, three questions that assess frequency on a four-point scale, two that assess involvement on a five-point scale, and one with a dichotomous response (See Appendix D). Using principal components analysis and varimax rotation, the variables were loaded into a confirmatory factor analysis. The initial correlations indicate that one variable was not correlated with the others: "During a typical week, how many hours do you spend working for pay outside of school?". This item was then eliminated. Table 7 displays the means and standard deviations for the remaining items.

A second confirmatory factor analysis was run with the remaining eight variables. Results from the Bartlett's test of sphericity indicate a significant correlation (1068.463, df = 28, sig = .000). The sampling adequacy of the measure was moderate, as indicated by the Kaiser-Meyer-Olkin measure which was .68. In addition, both the scree plot and the principal components analysis indicate a two-factor solution. One factor appears to represent community support and the second factor provides an indicator for community involvement. For the first factor, community support, the eigenvalue is 2.30 with 28.78% of the variance explained and an average communality score of .45. The second factor had an eigenvalue of 1.55 with 19.40% of the variance explained and an average communality score of .60. Cronbach's alpha is .63 for community support and .60 for community involvement.

After summing each of the responses, the final scale for community support ranges from 5-25. The final scale for community involvement is 3-12. For both scales, a lower score indicates a lower level of social capital. Mean, standard deviation, and range for these scales can be found in Table 8.

Table 7-

Community Social Capital Items

	Number of Cases	Mean	Standard Deviation
Community Support			
18a. Other than my parents/guardians and teachers, there are many other adults in my life that I could talk to about something important.	900	4.53	1.395
18b. I can trust the police in my local community.	899	4.62	1.374
18c. I feel that most adults in my community care about me.	894	4.33	1.229
20. During a typical school day, how many hours do you spend studying or doing homework outside of school?	904	2.57	1.005
27c. When I feel sad, empty, hopeless, angry, or anxious, I can talk about it with another adult (other than a parent or adult in this school).	904	1.15	0.356
Community Involvement			
19a. How recently have you participated in clubs or organizations other than sports, outside of school (4H, scouts, boys and girls clubs, YWCA, YMCA, etc.)?	900	2.22	1.229
19b. How recently have you practiced or taken lessons in music, art, drama, or dance, outside of school?	894	1.93	1.170
19c. How recently have you volunteered or helped other people without getting paid? (Include helping out at a hospital, daycare center, food shelf, youth program, community service agency, or doing other things.)	899	2.57	1.236

Table 8

Community Social Capital Scales

	Mean	Standard Deviation	Minimum	Maximum
Community Involvement	6.911	2.767	3.0	12.0
Community Support	17.736	3.503	5.0	25.0

Peer Social Capital

The peer social capital scale employed the same processes as the previous social capital measures. In the initial analysis, eight measures were examined. Of these questions, three were a six-response Likert scale, three were a six-response scale measuring peer associations, one was a five-response scale examining frequency, and the final question was a dichotomous yes/no response (See Appendix E). A confirmatory factor analysis was conducted with all the variables using principal components analysis and varimax rotation. Based on the initial correlations, one variable "In a typical week, how many of your four best friends have been suspended from school?" was not associated with the other variables and was excluded from further analyses. The means and standard deviations for the remaining items are displayed in Table 9.

After eliminating the peer suspension variable, another confirmatory factor analysis was conducted using the remaining variables. The second attempt indicated that the remaining variables were correlated through the Bartlett's test of sphericity (1437.266, df = 21, sig = .000). The Kaiser-Meyer-Olkin measure of sampling suitability was .66, indicating a moderate sampling adequacy.

Based on the scree plot, a two-factor solution emerged. This conclusion is supported by the principal components analysis which also produced a two-factor solution. The first solution

indicates peer involvement. The eigenvalue is 2.65 with 37.86% of the variance explained and an average communality of.78. The second factor indicates peer support. The eigenvalue is slightly lower at 1.48 and 21.16% of the variance explained. The average communality is .51 for the second factor.

Table 9

Peer Social Capital Items

	Number of Cases	Mean	Standard Deviation
25a. I feel that my friends always care about me.	901	4.90	1.035
25b. My friends encourage me to be the best I can be.	899	4.81	1.094
25c. Through the use of social media networks, I feel more connected to students both in school and in the community.	897	4.55	1.390
26. In a typical week, how many evenings do you spend out with your friends?	901	2.76	1.238
27d. When I feel sad, empty, hopeless, angry, or anxious, I can talk about it with a friend.	904	1.62	0.485

Again, the variables for each factor were summed. A frequency table indicated a very low response rate for the peer involvement variable; with a total of 173 of the 904 students indicating they did not know the level of activity involvement of their friends. For this reason, the peer involvement variable was dropped from any further analyses.

The alpha value for the second solution, peer support, was .676. The peer support variable includes questions 25a, 25b, 25c, 26, and 27d, with scores ranging from 5-25. The final means and standard deviations for this scale can be found in Table 10.

Table 10

Peer Social Capital Scale

	Mean	Standard Deviation	Minimum	Maximum
Peer Support	18.919	3.538	5.0	25.0

Immigration Status

The second independent variable used in the current study was immigration status. Three categories for this variable were created: have always resided in the United States, have resided in the United States for more than six years, and have resided in the United States for six years or less. This cutoff point was chosen based off of Blake et al's (2001) study of immigration and substance use. This cutoff allowed for differences to be observed between native-born, immigrant, and recent immigrant populations while still preserving an adequate sample size.

Control Variables

The first control variables examined in the current study were demographic variables. Grade was included as a control variable (9^{th}, 10^{th}, 11^{th}, 12^{th}) as well as gender (female or male). In addition, an indicator of residential mobility was also used. In his examination on the impact of moving on substance use, Dweit (1998) found that moving was associated with substance use. For this reason, a dichotomized indicator of movement in the last two years was included as a control variable.

In addition to demographic variables, family related variables were also implemented as controls. These include parental education, parental employment status and the current living arrangement of the adolescent. Education and employment status were asked separately for the female and male head of household. Finally, the living arrangement of the surveyed adolescent

was also included as a control variable. Prior research has indicated that adolescents from non-intact families report higher rates of substance use (Flewelling & Bauman, 1990). This variable was broken down into three categories: the adolescent was living with both biological or adoptive parents, was living with at least one biological or adoptive parent, or was living with non-parental adults (such as foster parents or other adult relatives).

Data Analysis

The data analysis of the current study first examined some descriptive statistics. To address the first research question, "Are higher levels of social capital related to higher levels of substance use?" a Pearson's correlation coefficient is used. Logistic and linear regressions are used to determine differences in levels of substance use across areas of social capital (family, school, community, and peer) and immigration status. To examine the final research question, "Do different areas of social capital (family, community, peer, school) influence substance use differently among native-born and immigrant adolescent students?", interaction effects between immigration status and social capital variables will be examined in relation to reported substance use. Chapter IV will discuss the results of these tests.

CHAPTER IV: RESULTS

The purpose of this study was to examine the relationship between immigration status and social capital on adolescent substance use. This chapter will provide an overview of the data in terms of demographics and substance use. Following this, the results for each of the above-mentioned research questions will be examined.

Description of Sample

This study involved the collection of data from three schools in a Midwestern city using the Student Social Capital Survey. After removing middle school students and surveys with a low response rate, there was a final sample of 904 students.

The frequency distribution for the variables included in the study can be found in Table 11. Ninth grade students represent the largest portion of participants, making up 30.6% of the sample and totaling 277 students. Twelfth graders had the fewest participants with a total of 182 students. Females made up just under half of the sample with 439 (48.6%) compared to 462 males (51.1%). The majority of the sample has also been in the school district for the last two years with 749 (82.9%) being non-mobile and 143 (15.8%) being mobile. In terms of familial characteristics, the frequency analysis revealed that a large percentage of the students did not know the levels of education their parents have received as well as the employment status of their father. For this reason, these variables were excluded from further analyses. The remaining familial characteristics, mother/female head of household employment and living arrangements, were included. Frequencies of these variables indicate that the majority of students live with both parents (59.3%) with the fewest being not living with either parent (5.5%) and that the majority of their mothers have at least part-time employment (80.4%). Sixteen percent of the study sample reported use of at least one of the four substances in the past 30 days.

Table 11

Demographic Information for Survey Respondents (N=904)

	Number	Percent
Immigration Status		
Born in U.S.	681	75.3
In U.S. for more than 6 years	59	6.5
In U.S. for 6 years or less	162	17.9
Grade		
9th Grade	277	30.6
10th Grade	220	24.3
11th Grade	225	24.9
12th Grade	182	20.1
Gender		
Female	439	48.6
Male	462	51.1
Residential Mobility		
Non-mobile	749	82.9
Mobile	143	15.8
Living Arrangements		
Both Parents	536	59.3
One Parent	311	34.4
Not Living with Either	50	5.6
Mother Employment		
Employed	727	80.4
Not Employed	137	15.2
Substance Use		
Reported Use	142	15.7
Did not Report Use	749	82.9

Results for Research Question One

The first research question examined in the current study is "Are higher levels of social capital related to lower levels of substance use?". To examine this relationship a Pearson's correlation was conducted (see Table 12). The Pearson's correlation is a standardized measurement used to assess the strength between two variables. While no causal conclusions can be drawn from the test, it adequately addresses the current question by providing an indicator of the strength of the relationship between each of the variables.

Table 12 indicates that three of the five social capital variables assessed are significantly related to whether students used a substance use in the previous 30 days and frequency of substance use. The family (r= -0.23), school (r= -0.24), and community support (r= -0.23) social capital variables are all significantly, negatively associated with substance use and frequency of use at the 0.01 level. This indicates that stronger relationships with family and school as well as higher levels of support within the community, are associated with lower levels of substance use among adolescents. The remaining social capital variables, peer support and community involvement, were not significantly related to substance use. These results indicate that some types of social capital are related to substance usage among adolescents—consistent with social capital theory.

Results for Research Question Two

The second research question addressed in the present study is "Do social capital and immigration status influence substance use?". This question was assessed using two separate equations. First, using binary logistic regression, this relationship was examined through the use of a dichotomized substance use outcome. Following this, a continuous substance use measure was employed to assess whether social capital and immigrant status affect the frequency of use. This test employed ordinary least squares regression.

Binary Logistic Regression

The first step to address the second research question was to conduct binary logistic regression using the binary measure of substance use (see Table 7). A binary logistic regression was used to address the second research primarily due to the dichotomous nature of the substance use variable. The binary logistic regression allows for explanations to be drawn between a dichotomous variable and multiple levels of independent variables (nominal, ordinal, interval, and/or ratio).

Before the binary logistic regression could be calculated, a test of collinearity was conducted to ensure that none of the variables presented an issue of multi-collinearity. Multi-collinearity is not a concern as indicated by the tolerance scores which are all above .1 (min= .490) and the variance inflation factor (VIF) scores which are all below 10 (max= 2.039) (Field, 2009).

In the initial model, Model 1, all of the control variables were included. Model 1 is significant at the .001 level, over and above the baseline (intercept model). In the model, gender is coded so that females are represented by one and males are indicated by a two. This is similar for residential mobility where there are two groups mobile (2) and non-mobile (1) and employed mother (1) versus non-employed (2). The regression equation indicated that two variables are significant predictors of substance use: grade (B= .51, $p<.001$) and living arrangements. This finding demonstrates that adolescents in higher grades were more likely to report substance use in the last 30 days. Adolescents who didn't live with their parents were also the most likely to report substance use (B=1.101, $p<.05$), with those living with both parents being the least likely to report substance use (B=.597, $p<.01$).

The second model included all of the control variables included in Model 1 and adds the immigration status variable. Model 2 indicates a significant model at the .01 level and improves upon the model fit compared to Model 1. Three variables in the model are significant predictors of self-reported substance use: grade (B=.518, $p<.001$), living arrangement (living with one parent (B=.635, $p<.01$) and living with no parent (B=1.442, $p<.01$)), and immigration status. Adding immigration status into the model did not change the predictive ability of grade and living arrangements; however, both immigrants who have lived in the U.S. for more than six years (B=-1.145, $p<.05$) and immigrants living in the U.S. for six years or less (B=-1.153, $p<.01$)

Table 12

Correlation Matrix

	Substance Use Dich.	Substance Use Frequency	Immigration Status	Family Social Capital	School Social Capital	Community Involve.	Community Support	Peer Support	Grade	Gender	Residential Mobility	Living Arrange.	Mother Employ.
Substance Use Dichotomized	1	.712**	-.110**	-.253**	-.231**	-.019	-.178**	-.010	.204**	-.043	.023	.136**	-.005
Substance Use Frequency	.712**	1	-.085*	-.229**	-.237**	-.030	-.228**	-.021	.194**	.054	.041	.081*	.014
Immigration Status	-.110**	-.085*	1	.049	.198**	-.168**	.096**	.009	-.024	.028	.151**	.135**	.280**
Family Social Capital	-.253**	-.229**	.049	1	.473**	.132**	.539**	.321**	-.115**	.022	-.067	-.202**	.005
School Social Capital	-.231**	-.237**	.198**	.473**	1	.041	.630**	.406**	-.063	.043	.050	-.025	.049
Community Involve.	-.019	-.030	-.168**	.132**	.041	1	.187**	.145**	.006	-.172**	-.141**	-.136**	-.104**
Community Support	-.178**	-.228**	.096**	.539**	.630**	.187**	1	.377**	-.044	-.068*	-.079*	-.091**	.028
Peer Support	-.010	-.021	.009	.321**	.406**	.145**	.377**	1	-.015	-.080*	-.025	-.051	-.093**
Grade	.204**	.194**	-.024	-.115**	-.063	.006	-.044	-.015	1	.027	.014	.055	.005
Gender	-.043	.054	.028	.022	.043	-.172**	-.068*	-.080*	.027	1	.072*	-.049	.009
Residential Mobility	.023	.041	.151**	-.067	.050	-.141**	-.079*	-.025	.014	.072*	1	.183**	.109**
Living Arrange.	.136**	.081*	.135**	-.202**	-.025	-.136**	-.091**	-.051	.055	-.049	.183**	1	-.003
Mother Employ.	-.005	.014	.280**	.005	.049	-.104**	.028	-.093**	.005	.009	.109**	-.003	1

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 13

Binary Logistic Regression of Dichotomized Substance Use

	Model 1			Model 2			Model 3		
	B	S.E.	Exp (B)	B	S.E.	Exp (B)	B	S.E.	Exp (B)
Grade	.507**	.094	1.660	.518**	.096	1.679	.495**	.102	1.640
Gender (female=1, male=2)	-.295	.208	.744	-.296	.210	.744	-.231	.228	.794
Residential Mobility (non-mobile=1, mobile=2)	.244	.270	1.276	.293	.278	1.341	.272	.299	1.312
Living Arrangement (both parents)									
One Parent	.597*	.213	1.816	.635**	.215	1.887	.454*	.231	1.574
No Parent	1.101**	.468	3.008	1.442**	.491	4.228	1.267**	.529	3.552
Mother Employment (employed=1, unemployed=2)	-.133	.298	.875	.114	.310	1.121	.244	.329	1.277
Immigration Status (born in the U.S.)									
> 6 Years				-1.145*	.560	.318	-1.420*	.593	.242
≤ 6 Years				-1.153**	.391	.316	-.765	.407	.465
Family Social Capital							-.057**	.016	.944
School Social Capital							-.098**	.026	.907
Community Involvement							.008	.044	1.008
Community Support							-.013	.040	.988
Peer Support							.102**	.035	1.108
Model Chi-Square			46.200			60.646			115.308
Constant	-5.117	.658	.006	-5.082	.666	.006	-1.443	1.069	.236

**. significant at the 0.01 level

*. significant at the 0.05 level

were significantly related to substance use. This indicates that newer immigrants had lower substance use odds compared to native born adolescents.

The final model included all of the control variables as well as immigration status and the social capital measures. Model 3 was significant at the .01 level. The difference between the Chi-square between Model 3 and Model 2 indicates that Model 3 significantly improves upon the prior model. Model 3 indicates that six of the observed variables are significant. These include two control variables, grade and living arrangements, immigration status, and three social capital variables: family social capital (B=-.057, p<.01), school social capital (B=-.098, p<.01), and peer support (B=.102, p<.01). The negative relationship between family and school social capital and substance use indicates that students who had higher levels of family and school social capital reported lower levels of substance use. On the contrary, the peer support variable indicates that higher levels of peer support are related to higher levels of reported substance use. Finally, comparing Model 3 to Model 2, the coefficient for one of the immigration status measures (lived in the U.S. for less than six years) became non-significant. This indicates that social capital variables partially explain the relationship between immigration status and substance use. This relationship will be further explored later in the current study.

Ordinary Least Squares Regression

The second way in which the second research question was assessed was through the use of ordinary least squares regression. An ordinary least squares regression was used because it allows for variation in a continuous dependent variable to be explained through the examination of independent variables of different measurements (nominal, ordinal, interval, and/or ratio). For this reason, ordinary least squares regression was employed to explain the frequency of

substance use based on social capital, immigrant status measures, and control variables (Table 14).

The multiple-linear regression used the continuous substance use measure, which assessed self-reported frequency of substance use. Before the analysis was run, a test to examine the assumption of collinearity was conducted and indicated that multi-collinearity is not a concern as all of the tolerance scores were above 0.1 (ranging from .490 to .997) and all of the VIF scores were lower than 10 (ranging from 1.002 to 2.039). The data also met the assumption of independent errors (Durban-Watson= 2.099).

In the initial model, both grade and living arrangement were associated with frequency of substance use. Grade was positively related at the .001 level indicating students in higher grades report more frequent use. Living arrangements were significant at the .05 level. The positive relationship indicates that the more disrupted the living arrangement a child has, the higher frequency of substance use they report. Overall, the initial model is significant ($F(5, 747) = 7.384$, $p < .000$), with an R^2 of .047; however, the small R^2 value represents that a minimal amount of variance is explained with the model.

The second model includes the control variables examined in the first model and added immigration status into the equation. Model two was also significant, and explained slightly more of the variance than Model 1 ($F(6, 746) = 7.306$, $p < .000$), with an R^2 of .055. In this model, both grade and living arrangements remained significant at the .01 and .05 levels respectively. In addition, immigration status was also found to be significantly related to frequency of substance use at the .01 level. This demonstrates that more recent immigrants report lower frequencies of substance usage while controlling for background characteristics.

Table 14

Linear Regression of Frequency of Self-Reported Substance Use

	Model 1			Model 2			Model 3		
	Beta	t	Sig.	Beta	t	Sig.	Beta	t	Sig.
Grade	.189	5.273	.000	.186	5.214	.000	.160	4.619	.000
Gender	.053	1.464	.144	.056	1.556	.120	.071	1.996	.046
Residential Mobility	.036	.968	.334	.044	1.196	.232	.039	1.094	.274
Living Arrangements	.073	2.004	.045	.080	2.197	.028	.040	1.126	.260
Mother Employment	.013	.364	.716	.038	1.026	.305	.048	1.323	.186
Immigration Status				-.096	-2.576	.010	-.053	-1.436	.151
Family Social Capital							-.126	-2.997	.003
School Social Capital							-.160	-3.370	.001
Community Involvement							.011	.314	.754
Community Support							-.090	-1.851	.065
Peer Support							.113	2.925	.004
R^2			.047			.055			.132

Model 3 was the final linear model conducted. In Model 3, all of the variables were inputted including the control variables and all of the independent variables. This was also a significant model ($F(11, 741) = 10.207$, $p < .000$), with an R^2 of .132. In the final model, grade continues to be significantly, positively related to frequency of use; however, the living arrangement and immigration status were no longer significant. This suggests that once social capital variables are accounted for, immigration status is no longer a significant predictor of self-

reported frequency of substance use. In addition, when adding social capital variables into the model, gender became a significant factor, with males being more likely to report higher frequencies of substance use. Finally, Model 3 indicates that three of the five examined social capital variables are significantly related to self-reported frequency of substance use. Family and school social capital measures indicate that an increase in family and school social capital is related to a less frequent substance use. In addition, the peer support social capital variable was also significant. The positive relationship indicates that increases in peer support is related to higher reported rates of substance use—a finding that conflicts with social capital theory.

Results for Research Question Three

The final research question for the current study is "Do areas of social capital (family, community, peer, school) influence substance use differently among native-born and immigrant adolescent students?". Since the linear regression done to assess question two revealed that immigration status is not a significant predictor of substance use frequency after accounting for social capital variables, substance use frequency was not examined in this section. Instead, the focus for question three is on the dichotomized indicator of substance use.

The initial correlations made to address question one (refer to Table 6) indicate that immigration status has a significant, negative correlation with the dichotomized substance use variable ($r=-.110$, $p<.01$). Based on the results from the binary logistic regression conducted earlier, it would be predicted that immigration status has a positive relationship with family and school social capital variables and a negative relationship with peer support. However, the initial correlations table indicates that only one of these variables is significantly related to immigration status, school social capital ($r=.198$, $p<.01$). Both family social capital and peer support are not significantly related to immigration status. In addition, community involvement ($r=-.168$, $p<.01$)

and community support (r=.096, p<.01) were both significantly related to immigration status, but were not significant predictors of substance use in the logistic regression.

To examine the relationship between immigration status and social capital variables on their ability to predict reported substance use, an interaction was conducted within a binary logistic regression (see Tables 15-17). An interaction term was created for immigration status and each of the five social capital variables; however, since community support and community involvement were not significant in any of the models, these have not been included in this section.

To examine this relationship, three models were conducted, one for each interaction effect. Tables 15-17 indicate that only one of the social capital variables, school social capital, had a significant interaction effect with immigration status when examining reported substance use (B=.387, p<.01). This interaction between immigration status and school social capital indicates that low school social capital has greater effects on adolescents born in the United States than it does for newer immigrant groups. This indicates that low school social capital puts U.S. born students at higher odds for reporting substance use than it does for immigrant students who have lived in the U.S. for less than six years. This effect is not significant among immigrants who have lived in the U.S. for more than six years.

Table 15

Logistic Regression with Family by Substance Use Interaction

	Model 1			Model 2		
	B	S.E.	Exp (B)	B	S.E.	Exp (B)
Grade	.508**	.101	1.661	.510**	.101	1.655
Gender (female=1, male=2)	-.264	.221	.768	-.260	.221	1.655
Residential Mobility (non-mobile=1, mobile=2)	.271	.294	1.311	.287	.296	1.332
Living Arrangement (both parents)						
One Parent	.475*	.227	1.609	.467*	.229	1.596
No Parent	1.189*	.561	3.282	1.179*	.529	3.251
Mother Employment (employed=1, unemployed=2)	.225	.328	1.252	.235	.328	1.265
Immigration Status (born in U.S.)						
> 6 Years	-1.276*	.537	.279	-3.548	2.140	.029
≤ 6 Years	-.751	.404	1.311	-.492	1.958	.612
Family Social Capital	-.059**	.015	.942	-.064**	.017	.938
School Social Capital	-.102**	.023	.903	-.101**	.023	.904
Peer Support	.105**	.034	1.111	.108**	.035	1.114
Family Social Capital by Immigration Status (born in U.S.)						
> 6 Years				.057	.050	1.059
≤ 6 Years				-.006	.042	.994
Model Chi-Square			4.532			6.924
Constant	-1.525	1.040	.218	-1.422	1.077	.241

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 16

Logistic Regression with School by Substance Use Interaction

	Model 1			Model 2		
	B	S.E.	Exp (B)	B	S.E.	Exp (B)
Grade	.508**	.101	1.661	.504**	.101	1.655
Gender (female=1, male=2)	-.264	.221	.768	-.251	.223	.778
Residential Mobility (non-mobile=1, mobile=2)	.271	.294	1.311	.280	.300	1.323
Living Arrangement (both parents)						
One Parent	.475*	.227	1.609	.504*	.230	1.655
No Parent	1.189*	.561	3.282	1.282*	.540	3.605
Mother Employment (employed=1, unemployed=2)	.225	.328	1.252	.223	.336	1.249
Immigration Status (born in U.S.)						
> 6 Years	-1.276*	.537	.279	-.001	2.658	.999
≤ 6 Years	-.751	.404	1.311	-12.530**	4.431	.000
Family Social Capital	-.059**	.015	.942	-.058**	.015	.944
School Social Capital	-.102**	.023	.903	-.115**	.024	.891
Peer Support	.105**	.034	1.111	.114**	.035	1.121
School Social Capital by Immigration Status (born in U.S.)						
> 6 Years				-.049	.103	.952
≤ 6 Years				.387**	.139	1.473
Model Chi-Square			4.532			3.872
Constant	-1.525	1.040	.218	-1.448	1.055	.235

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 17

Logistic Regression with Peer Support by Substance Use Interaction

	Model 1			Model 2		
	B	S.E.	Exp (B)	B	S.E.	Exp (B)
Grade	.508**	.101	1.661	.503**	.101	1.654
Gender (female=1, male=2)	-.264	.221	.768	-.270	.222	.763
Residential Mobility (non-mobile=1, mobile=2)	.271	.294	1.311	.264	.296	1.303
Living Arrangement (both parents)						
One Parent	.475*	.227	1.609	.468*	.228	1.597
No Parent	1.189*	.561	3.282	1.161*	.539	3.192
Mother Employment (employed=1, unemployed=2)	.225	.328	1.252	.233	.330	1.262
Immigration Status (born in U.S.)						
> 6 Years	-1.276*	.537	.279	1.464	2.736	4.323
≤ 6 Years	-.751	.404	1.311	.244	1.922	1.277
Family Social Capital	-.059**	.015	.942	-.059**	.015	.943
School Social Capital	-.102**	.023	.903	-.105**	.023	.901
Peer Support	.105**	.034	1.111	.118**	.037	1.125
Peer Support by Immigration Status (born in U.S.)						
> 6 Years				-.147	.149	.863
≤ 6 Years				-.053	.101	.948
Model Chi-Square			4.532			6.297
Constant	-1.525	1.040	.218	-1.688	1.067	.185

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Summary

As social bond and social capital theory would predict, initial Pearson's correlations indicate that there is a significant relationship between family, school, and community social capital measurements and substance use. This relationship is significant both for use and frequency of use.

Further explorations between immigration status and social capital on reported substance use provide a more detailed report of these relationships. Results from the binary logistic regression and the multiple-linear regression provide further insight into this relationship. The binary logistic regression indicates that immigration status as well as family, school, and peer social capital are all related to substance use after controlling for other demographic and background variables. However, while immigration status and family and school social capital all predicted substance use in the expected direction, peer support had the opposite effect. The multiple-linear regression, which examined frequency of substance use, resulted in similar conclusions; however, in the linear regression, after inputting social capital measures, immigration status lost significance.

The final assessment done in the current study was to examine any differences in how social capital and immigration status together influence reported substance use. Interaction effects demonstrate that immigration status and school social capital have a significant interaction effect. This indicates that low levels of school social capital make a significant difference in reported substance use among adolescents born in the United states.

CHAPTER V: CONCLUSION

The final chapter will provide an overview of the current study as well as how the results compare to existing research on the topic. In addition, some limitations of the current study and recommendations for future research will also be discussed.

Summary

The purpose of the current study was to investigate differences in self-reported substance use by examining immigration status and social capital variables. To assess this relationship, data was gathered from area public schools. Data was collected at one local middle school and high school as well as the ELL students of another high school in a Midwest city using the Student Social Capital Survey. For the purposes of this analysis, middle school students and students who did not complete a substantive portion of the survey were removed from the analysis, resulting in a total sample of 904 students. Initial correlations were drawn to examine a connection between the variables followed by several statistical analyses. A binary logistic regression and multiple-linear regression were done to examine the predictive value of immigration status and social capital on any reported substance use and frequency of use respectively. In addition, the interaction effects of immigration status and each of the social capital variables was calculated in a binary logistic regression to assess whether it provides a better indication of reported substance use. The conclusions drawn for each of the research questions will be discussed in more detail below.

The first research question examined in the current study is “Are higher levels of social capital related to higher levels of substance use?”. Hirschi’s (1969) social bond theory proposes that individuals who have stronger bonds to society are more likely to refrain from crime and deviancy. In particular, Hirschi discussed four elements that make up these social bonds,

including attachment, commitment, involvement, and belief. Overall, these elements overlap with the concept of social capital which also examines the relationships that a person has with other people. Both the social bond and social capital perspectives would predict there to be a link between these social relationships and substance use. To examine this, a Pearson's correlation was conducted. These correlations indicate that three of the five social capital variables are significantly related to reported substance use. Family, school, and community support measures of social capital were each negatively associated with substance use, consistent with social bond and social capital theories.

The initial correlations found from the first research question indicated the need for a further analysis of this relationship which lead to the second research question, "Do social capital and immigration status influence substance use?". This question was assessed in two parts. First, a binary logistic regression was conducted to examine the effects that immigration status and social capital have on any reported substance use. This analysis utilized the dichotomous indicator of substance use. The conclusions of this regression indicated that including the control variables, immigration status, and social capital variables provided the best model for predicting substance use. In the final model, two social capital variables (family and school) were significantly reported to substance use among adolescents. While this provides some support for social capital theory (particularly regarding the importance of familial and school-based social capital), these results also provide additional support for social bond theory. The questions measuring family and school social capital are in line a mechanism of the social bond: attachment. For example, questions 13a-13i of the family social capital all provide an indication of attachment between children and their parents (see Table A2). In addition, when examining the school social capital variable, questions 14a-14f all reflect adolescent levels of attachment to

their school (see Table A3). Therefore, the significant results for family and school in the current study provide support for both theories. Peer support on the other hand was a significant predictor of substance use, however, was not in the expected direction. This may suggest that peer social capital and strong peer bonds do not reduce the likelihood of substance use. Instead, these relationships are doing the opposite of what social bond and social capital theory would predict.

The second part of analyzing the research question number two involved the use of an OLS regression to examine frequency of substance use. This regression resulted in similar findings as the logistic regression in terms of social capital variables; however, in the linear regression, adding social capital variables into the model resulted in immigration status becoming insignificant. In other words, once the social capital variables are accounted for, immigration status is no longer a significant predictor for the frequency of substance use. Consistent with the binary logistic regression, these results provide support for both social bond and social capital theory. These results also indicate that there may be cultural differences in the impact of social bonds. These differences may be explained by examining previous literature on social capital. For example, in their examination of social capital among immigrants, Walsh et al (2010) found that for immigrant youth, parental support within the school and the overall school environment were the strongest predictors of at risk behaviors whereas for native born adolescents, parents, school, and peers were all significant predictors.

The final question for the current study was ““Do different areas of social capital (family, community, peer, school) influence substance use differently among native-born and immigrant adolescent students?”. To examine this relationship, interaction effects between immigration status and each of the social capital variables was examined in relation to the dichotomized

substance use variable through the use of a logistic regression analysis. The regression indicated that only one of the interaction effects, immigration status and school social capital, was significant. This interaction suggests that for native born adolescents, low school social capital increases the odds of engaging in substance use at a higher rate than it does for adolescents who have lived in the United States for six years or less. In terms of the two theories included in the current study (social bond and social capital), this finding may suggest that new immigrants have some sort of protective factor that immigrants who have resided in the United States for longer periods of time and people born in the United States do not have. This provides an interesting relationship that should be explored in future research on the topic.

Overall, the results of this study provide some support for social bond and social capital theories. While not all the measures of social capital were significant predictors of substance use, family and school social capital were consistently significant predictors of both any substance use as well as frequency of use. The current study also provides support for the concept of attachment within Hirchi's social bond theory. Both family and school social capital measures support the idea that higher levels of attachment lead to lower rates and frequency of substance use. Finally, based on the current finding, it appears involvement is less predictive of substance use behaviors than attachment. For example, while some of the indicators of attachment reached significance, none of the variables measuring involvement reached significance (including questions 19a-20 of the community involvement scale; see Table A4).

Limitations

The current study experienced several limitations. First, a purposive and availability sample was used to gather data from students. For this reason, it cannot be assumed that the participants involved in the current study are representative of the general population in the area.

In addition, the survey used for the current study has not been empirically validated. The current implementation of the survey was a trial run for the survey which the community coalition used to assess any potential problems with the survey and/or problems with the administration procedures.

In addition, the rates of reported substance use observed in the current study is much lower than self-reported use obtained in previous years from the YRBS. For example, in the 2015 YRBS, self-reported rates of alcohol consumption were 24.1% and 24.9% in the two high schools involved in the current study. Comparatively, the current study found 11.0% of students reporting alcohol use. The self-reported substance use could be lower in the current study for several reasons. One possible explanation is that substance use has drastically declined in the area due to increased educational efforts, lower availability, etc. It could also be the case that having the substance use questions at the end of the Student Social Capital Survey resulted in a larger proportion of students not answering the question due to time constraints. Student may also have been skeptical of reporting use as the survey was taken of a school-appointed tablet, which may have created an additional concern for privacy compared to paper-and-pencil surveys. Since it is difficult to assess why reported use is lower than previous years, this should be noted as a limitation of the current study.

Finally, the low R^2 value should also be noted as a limitation. While the OLS regression did reach significance in the current study, the R^2 values for all three of the models was very low, indicating that minimal amounts of variation in substance use frequency is being explained. These low R^2 values could be the result in the lack of variation within the sample. First, as noted previously, the rates of reported substance use in the sample was very low which resulted in less variation within both overall use and frequency of use. In addition, measures of social capital

also tended to be fairly high, resulting in less variation in the scales. However, the low R^2 value could also indicate that other influential variables are missing from the current study.

Recommendations

Overall, the current study sought to examine the relationship between immigration status and social capital on substance use behaviors; however, several limitations presented by the current study present opportunities for further research in this area. One recommendation for future research is to examine this relationship using a validated survey instrument that measures various forms of social capital. Due to constraints regarding survey length, the Student Social Capital Survey had to be limited in the total number of questions which could have impacted the measurement of social capital. For this reason, similar studies should be done to see if these findings are consistent.

In addition, other studies should further break down immigration status into more categories rather than examining three time blocks. This may allow for further conclusions to be drawn between immigrant groups who have resided in the U.S. for a variety of time periods. Similarly, research examining different cultural groups in reference to social capital and its relationship with substance use may also be beneficial. This would provide insight into whether cultures differ among this relationship as well.

Information derived from this study may also provide recommendations to practitioners and community members. Based on the current study, older adolescent males who were born in the United States and have low levels of school social capital are likely to have higher rates of substance use compared to other adolescents. Based on this description, it may be useful to target prevention efforts towards these individuals.

In addition, based on the self-reported measures of social capital, it appears as through youth in the observed community already enjoy high levels of social capital within the community, which may help explain the low levels of substance use. Based on this data, additional community efforts to increase social capital may be best directed towards investigating what current efforts aiding in this development of social capital. However, if further efforts to increase programs aimed at increasing adolescent social capital, the current research suggests that efforts directed towards building familial and school bonds may be most effective in reducing substance use.

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APPENDIX. FACTOR ANALYSIS SCALE QUESTIONS

The appendix tables outline each of the questions from the survey that were used to develop the factor analysis scales. Included in each of the Appendix tables are the survey questions and all possible answer choices.

Table A1

Substance Use Questions

Question	Answer Options
28a. During the last 30 days, on how many days did you use any tobacco products (cigarettes, electronic cigarettes, vaping, chewing tobacco, cigars, cigarillos, little cigars, etc.)?	0 Days 1-2 Days 3-9 Days 10-19 Days 20-29 Days All 30 Days
28b. During the last 30 days, on how many days did you have one or more drinks of an alcoholic beverage (beer, wine, liquor, etc.)? (Do not count a few sips for religious purposes)	0 Days 1-2 Days 3-9 Days 10-19 Days 20-29 Days All 30 Days
28c. During the last 30 days, on how many days did you use marijuana (pot, weed, grass, etc.)?	0 Days 1-2 Days 3-9 Days 10-19 Days 20-29 Days All 30 Days

Table A2

Family Social Capital Questions

Question	Answer Options
12. On average, how many times a week do you eat with your family?	0 times 1-2 times 3-4 times 5-6 times 7-8 times 9 or more times
13a. My parents/guardians set clear rules for me.	Strongly Agree Agree Slightly Agree Slightly Disagree Disagree Strongly Disagree
13b. When I am not at home, one of my parents/guardians knows where I am and who I am with.	Strongly Agree Agree Slightly Agree Slightly Disagree Disagree Strongly Disagree
13c. I regularly share my thoughts and feelings with my parents/guardians.	Strongly Agree Agree Slightly Agree Slightly Disagree Disagree Strongly Disagree
13d. I enjoy spending time with my parents/guardians.	Strongly Agree Agree Slightly Agree Slightly Disagree Disagree Strongly Disagree
13e. My parents/guardians regularly talk to me about how I am doing in school.	Strongly Agree Agree Slightly Agree Slightly Disagree Disagree Strongly Disagree

Table A2. *Family Social Capital Questions (Continued)*

Question	Answer Options
13f. My parents/guardians regularly attend meetings or events at my school and activities in the community.	Strongly Agree Agree Slightly Agree Slightly Disagree Disagree Strongly Disagree
13g. My parents/guardians encourage me to do the best I can.	Strongly Agree Agree Slightly Agree Slightly Disagree Disagree Strongly Disagree
13h. I feel that my parents/guardians always care about me.	Strongly Agree Agree Slightly Agree Slightly Disagree Disagree Strongly Disagree
13i. My parents/guardians often tell me they are proud of things I have done.	Strongly Agree Agree Slightly Agree Slightly Disagree Disagree Strongly Disagree

Table A3

School Social Capital Questions

Question	Answer Options
14a. I feel valued as a person in my school.	Strongly Agree Agree Slightly Agree Slightly Disagree Disagree Strongly Disagree
14b. I feel the adults at my school care about me as a student.	Strongly Agree Agree Slightly Agree Slightly Disagree Disagree Strongly Disagree
14c. My school has clear rules, policies, and regulations that they expect me to follow.	Strongly Agree Agree Slightly Agree Slightly Disagree Disagree Strongly Disagree
14d. My school consistently enforces the rules, policies, and regulations that are in place.	Strongly Agree Agree Slightly Agree Slightly Disagree Disagree Strongly Disagree
14e. Adults at my school encourage me to be the best I can.	Strongly Agree Agree Slightly Agree Slightly Disagree Disagree Strongly Disagree
14f. I can talk to adults at my school openly and freely about my problems and concerns.	Strongly Agree Agree Slightly Agree Slightly Disagree Disagree Strongly Disagree

Table A4

Community Social Capital Questions

Question	Answer Options
18a. Other than my parents/guardians and teachers, there are many other adults in my life that I could talk to about something important.	Strongly Agree Agree Slightly Agree Slightly Disagree Disagree Strongly Disagree
18b. I can trust the police in my local community.	Strongly Agree Agree Slightly Agree Slightly Disagree Disagree Strongly Disagree
18c. I feel that most adults in my community care about me.	Strongly Agree Agree Slightly Agree Slightly Disagree Disagree Strongly Disagree
19a. How recently have you participated in clubs or organizations other than sports, outside of school (4H, scouts, boys and girls clubs, YWCA, YMCA, etc.)?	Never In the last 30 days In the last 12 months More than 12 months ago
19b. How recently have you practiced or taken lessons in music, art, drama, or dance, outside of school?	Never In the last 30 days In the last 12 months More than 12 months ago
19c. How recently have you volunteered or helped other people without getting paid? (Include helping out at a hospital, daycare center, food shelf, youth program, community service agency, or doing other things.)	Never In the last 30 days In the last 12 months More than 12 months ago
20. During a typical school day, how many hours do you spend studying or doing homework outside of school?	0 hours 1 hour 2 hours 3-5 hours 6 or more hours

Table A4. *Community Social Capital Questions (Continued)*

Question	Answer Options
27c. When I feel sad, empty, hopeless, angry, or anxious, I can talk about it with another adult (other than a parent or adult in this school).	Yes No

Table A5

Peer Social Capital Questions

Question	Answer Options
25a. I feel that my friends always care about me.	Strongly Agree Agree Slightly Agree Slightly Disagree Disagree Strongly Disagree
25b. My friends encourage me to be the best I can be.	Strongly Agree Agree Slightly Agree Slightly Disagree Disagree Strongly Disagree
25c. Through the use of social media networks, I feel more connected to students both in school and in the community.	Strongly Agree Agree Slightly Agree Slightly Disagree Disagree Strongly Disagree
26. In a typical week, how many evenings do you spend out with your friends?	0 evenings 1 evening 2 evenings 3-5 evenings 6 or more evenings
27d. When I feel sad, empty, hopeless, angry, or anxious, I can talk about it with a friend.	Yes No