

Migration Aspirations, Religiosity, and Sexual Behavior among Youth:
A New Look at Suicidal Ideation in Central Mexico

by

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ABSTRACT

While the suicide rate in Mexico is relatively low when compared to countries throughout the world, it is increasing at an alarming pace. Unfortunately, the amount of suicide research focused on Mexican populations is relatively scarce. Using a sample of high school students living in Guanajuato, Mexico, this study explored the relationship between recent suicidal ideation and three factors that previous research in other countries has connected to suicide: Migration aspirations, religiosity, and sexual behavior. Using multiple and logistic regression, the results indicated the following: 1) Recent suicidal ideation predicted increased migration aspirations, 2) higher levels of external religiosity predicted lower odds of recent suicidal ideation, and 3) stronger parent-child relationships predicted lower odds of recent suicidal ideation. The findings are discussed in light of the Bronfenbrenner's ecological systems theory, Bogenschneider's risk/protection model, and Stark's religious commitment theory.

DEDICATION

To my friends in Mexico

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Chapter 1

Introduction

Statement of the Problem

Throughout the world, suicide is a leading cause of death (Legleye, Beck, Peretti-Watel, Chau, & Firdion, 2009). There are psychological, emotional, and familial problems caused by suicide that can produce enduring difficulties for those left behind. Furthermore, in some countries, such as the US, the economic impact alone is estimated to be over \$111 billion a year (Miller, Covington, & Jensen, 1999). Due to the devastating impact of suicide on individuals, families, communities, and nations, governments throughout the world have developed national strategies to better understand and fight against this widespread problem (US Department of Health and Human Services, 2001).

While many nations grapple with the challenges of high suicide mortality, Mexico has enjoyed a comparatively low suicide rate of 3.72/100,000 (Puentes-Rosas, López-Nieto, & Martínez-Monroy, 2004). In fact, when compared to 50 other countries throughout the world, the suicide rate in Mexico ranked as the 4th lowest (Helliwell, 2007). When looking at worldwide trends over a period of 34 years, it was found that the highest rates of suicide were primarily found among countries in central Europe (e.g., Hungary), intermediate rates were found in North America (Mexico not included), New Zealand, and Australia, while the lowest rates were found in southern Europe and in the Latin American countries (La Vecchia, Lucchini, & Levi, 1994). While a broad comparison of international suicide rates may lead one to believe that suicide in Mexico is not a pressing

problem, a closer investigation into the country's historical suicide rates tells a different story.

Between 1970 and 1994, the suicide rate in Mexico rose from 1.13/100,000 to 2.89/100,000. Then, in 1994, the rate increased an unprecedented 156% (Santos-Preciado et al., 2003). When compared to 28 other countries, the suicide rate increase in Mexico between 1990 and 2000 was one of the highest (Borges, Benjet, Medina-Mora, Orozco, & Nock, 2008). Youth in Mexico are a population of great concern when looking at these numbers. Between 1990 and 2001, the suicide rate for youths ages 11-19 increased from 0.8/100,000 to 2.27/100,000 for girls and 2.6/100,000 to 4.5/100,000 for boys (Puentes-Rosas et al., 2004). Moreover, in 2003 the adolescent population accounted for 17% of all suicides in Mexico (Borges et al., 2008).

One state in Mexico that deserves particular attention is Guanajuato. Between 2000 and 2001, Chiapas (2008) reported a 6.7% increase in the suicide rate in Guanajuato. The suicide rate for males was reported to be 5.09/100,000, and for females 1.31/100,000. While these suicide statistics for men and women are fairly consistent with those of other states, the surprising numbers come from the youth in Guanajuato. Between 1997 and 2001, 65% of suicides in Guanajuato were committed by adolescents (Chiapas, 2008). When compared to the percentage of all suicides committed by youth nationwide (17%), the numbers in Guanajuato are stunning.

Previous suicide research provides valuable information to understand the best approach to address this growing problem. As shown in literature reviews

and government reports, research on suicide among any population generally looks at the topic from three vantage points: Suicidal ideation, suicide attempts, and completed suicides (Leitner, Barr, & Hobby, 2008; US Department of Health and Human Services, 2001). As written in their 2008 systematic review, Leitner, Barr, & Hobby (2008, p. 17) define each of those constructs as follows:

- A. **Suicidal Ideation:** “The existence of current wishes and plans to commit suicide.”
- B. **Suicide Attempt:** “A potentially self injurious action with a non-fatal outcome for which there is evidence, either explicit or implicit, that the individual intended to kill himself or herself.”
- C. **Suicide:** “The termination of an individual’s life resulting directly or indirectly from a[n]...act of the victim himself which he knows will produce this fatal result.”

The correlations between suicidal ideation and suicide attempts and completed suicides have consistently shown to be very strong (e.g., Botega et al., 2005; Kessler et al., 2005; US Department of Health and Human Services, 2001). Because of this, early recognition of suicidal ideation (and implementation of appropriate interventions) has been recommended as a primary method of preventing future suicide attempts and suicides (Brown, Wyman, Brinales, & Gibbons, 2007; Leitner, Barr, & Hobby, 2008; US Department of Health and Human Services, 2001; Wyman et al., 2009). Therefore, it is imperative that suicidal ideation among youth living in Guanajuato be studied in order to understand the unique risk and protective factors that are impacting the high

percentage of adolescent suicides. As asserted by González-Forteza (1998), studying suicide in Mexico at this time is essential in order to intervene and prevent this growing public health concern. Understanding the grim suicide numbers among youth in Guanajuato is an important step towards solving this mounting national problem.

Relevance of Problem to Social Work Research

The study of suicide and its correlates is essential to the advancement of social work research. One of the core principles as outlined in the National Association of Social Workers (NASW) statement of ethics (NASW, 1996) is the “dignity and worth of a person” (p. 148). This statement, as detailed in the document, does not only apply to the well-being of the individual, but also to the betterment of communities and broader society. As suicide is better understood through research, interventions assisting individuals struggling with suicidal thoughts and behaviors can be developed to prevent suicide, thus promoting the dignity and worth of the person. Furthermore, as individual members of the community are healthier and more stable through the implementation of suicide reduction programs, the community as a whole is healthier and stronger, both psychologically and economically. The study of suicide, thus, works in harmony with a primary goal and objective of the social work profession.

Another core principle as outlined in the Code of Ethics is the “importance of human relationships” (NASW, 1996, p. 148). The purpose of this principle is to strengthen the connections between individuals, families, and other social groups. As is widely understood, a suicide affects more than just the person who took his

or her life – it impacts the health and stability of family members and friends. The resulting emotional and psychological issues lead to a lower quality of life and work-related losses (e.g. productivity). In this way, suicide negatively impacts the family members, friends, and organizations that were linked to the victim. As a profession that values these relationships, social workers must acknowledge the potential that the study of suicide can have in improving relationships.

Perhaps the easiest way to see how the study of suicide is essential to social work research is to project what might happen if social workers ignored this social problem. Could the profession properly claim to be striving towards *any* of the goals and values it has set for itself (service, social justice, dignity and worth of a person, importance of human relationships, integrity, and competence) without addressing a social health issue that has devastating effects on individuals, families, and communities? An argument to the contrary would be difficult to support.

As outlined above, suicide research is a subject that should not be ignored by social workers. Fortunately, there are many social work researchers already conducting quality studies in this area. One of the most widely recognized social work faculty member studying suicide is Luis Zayas from the George Warren Brown School of Social Work at Washington University in St. Louis. Dr. Zayas is a Shanti K. Khinduka Distinguished Professor of Social Work, and the founder and director of the Center for Latino Family Research. His suicide research has covered topics such as the cultural considerations of suicide prevention (Goldston et al., 2008) and suicide in Puerto Rico (1989), and a primary focus of his studies

has been on suicide among adolescent Latina girls in the US (Zayas, 1987; Zayas et al., 2000; Zayas et al., 2005). Dr. Zayas is well recognized for creating a model to understand suicide among adolescent Hispanic females that highlights how the family sociocultural environment plays a key factor in suicide attempts (Zayas, Lester, Cabassa, & Fortuna, 2005).

In addition to the widely recognized work of Dr. Zayas, the field of social work has produced many additional studies focusing on suicide. Both Morrow (1993) and Proctor and Groze (1994) wrote articles touching on some of the risk factors and intervention strategies for suicide among gay, lesbian, and bisexual youth. In England, Byford and colleagues (1999) looked at the cost-effectiveness of a home-based social work intervention for children demonstrating suicidal behavior and found it to be effective among youth ages 16 and younger.

Furthermore, social work suicide interventions for elderly populations have been studied by Morrow-Howell, Becker-Kemppainen, and Judy (1998). The work of Zayas and these other social work academics has produced a strong foundation from which to continue suicide research in the US. This project will build from previous findings and assist in strengthening the foundation of suicide research in international settings.

While this study will increase our understanding of suicide in Mexico, new knowledge is not beneficial in and of itself: It must be applied. As this project is looking at suicidal ideation and other variables in an international environment and with a new population, it is anticipated that the findings will, in some way, be influential in changing public health policy. Perhaps the findings

will contribute to the obtaining of additional funds for suicide research in Mexico. As the results are coming from a high migratory community, perhaps researchers and policy makers in the US will also take notice of the findings. It would be irrational to anticipate the outcomes of this study causing sweeping policy changes, but along with previous and future research, government leaders may pay additional attention to the risk/protective factors for suicidal ideation. If that happens, they can then decide on policy alterations that will assist Guanajuato communities, and especially the youth living within them, address suicidal ideation issues before they become larger problems.

Theoretical Foundation

When looking at suicidal ideation and the aforementioned substantive areas, 5 theories emerge as relevant to this study: Durkheim's integration theory (Durkheim, 1897), Pescosolido's network theory (Pescosolido & Georgianna, 1989), Stack's religious commitment theory (Stack, 1983), Bronfenbrenner's ecological systems theory (Bronfenbrenner, 1986), and Bogenschneider's ecological risk/protection theory (Bogenschneider, 1996). In the following paragraphs a review of each of these theories will be presented.

The integration theory proposed by Durkheim (1897) has been the foundational basis of modern suicide research since the time of its publication. Upon seeing considerable differences in suicide rates among members of two religions that both condemned suicide, Durkheim asserted that the distinction between the two denominations was due to the high level of integration among members of the Catholic Church. He stated that a further contributing factor was

that the Protestant church permitted a much more liberal line of thinking and interpretation regarding church doctrine.

Perhaps the simplicity of Durkheim's theory is the reason for both its longevity and its susceptibility to critique. One such critique was set forth by Stack (1983) in which he questioned the measures used in Durkheim's original studies. Stack asserted that religious affiliation was inappropriately used, and that the people's level of religious commitment was the driving force behind the differences originally found. Stack also commented that Durkheim had only used bi-variate analysis, and that multi-variate models were needed in order to see the true relationship between religion and suicide. Further critiques of Durkheim's theory were set forth by other social scientists. Some concluded that Durkheim's work was flawed by his poor understanding of "elementary facts about religion in Europe at the time he wrote" (Stark, Doyle, & Rushing, 1983, p. 120). Others assert that his findings no longer hold true in today's complex society (Colucci & Martin, 2008; Pescosolido, 1990). Despite these common critiques, Durkheim's original thinking continues to influence suicide research in the social sciences.

Many years after Durkheim's study, Stack (1983) developed the religious commitment theory. Using data from 25 countries, Stack found that life-preserving religious beliefs, values, and practices were associated with lower suicide rates. His theory contradicted Durkheim's findings and suggested that religious affiliation is not as important as internal personal convictions. Two major strengths of his research were that he gathered data from more countries than Durkheim, and he also used more advanced statistical techniques that

permitted him to control for other variables such as gender. While religious research motivated by this theory is still being conducted today (Fiala, Bjorck, & Gorsuch, 2002; Nasim et al., 2006), it hasn't been immune to criticism.

One such limitation to this theory was highlighted in the original article (Stack, 1983). Stack himself noted that the findings only held true for women, and not for men. He attributed this to the idea that women are, in general, more religious than men. A more recent critique of this theory comes from Colucci and Martin (2008) in which they question his fundamental assertion that commitment to religious teachings is the true protective source behind the findings. They highlight that little research has been done among non-religious populations who hold personal spiritual beliefs. They assert that spirituality in general may be protective, and not necessarily a belief in specific religious values or practices. A further critique of the theory stems from literature on decision making (Black, 1997; Fernando & Jackson, 2006): Does what we believe drive our choices, or is it the influence our beliefs have on the decisions we make? For example, while one may believe that they will not go to heaven if they commit suicide, not going to heaven may not be an important factor influencing their decision making process. These questions have not been addressed in the literature. While it is not without limitations, the religious commitment theory has gained considerable attention in the suicide literature.

Pescosolido and Georgianna (1989) reconstructed Durkheim's original study using data from 1970 and found similar results. However, they interpreted the results in a different way – they theorized that the reason for different suicide

rates between religious groups was because of social networks. Their study thus became the foundation for looking at suicide through the lens of network theory. Network theory asserts that networks are formed with family members, friends, acquaintances, and others; however, not all networks are of equal strength, nor are they all necessarily beneficial (Granovetter, 1983). Dunn (1983) adds that these relationships are formed not only by frequency of contact, but also through congruency of beliefs (such as in a religious setting). In a later article, Pescosolido (1990) emphasized that networks, without considering context (e.g. church environment), do not have strong explanatory power.

One difficulty with network theory is the challenge of finding and measuring the primary networks that influence an individual. As highlighted by Thomas (2000), the methodology involved with studying network theory can be extremely complex and involved. Perhaps because of this, more simplistic social networks measures have been created (Dervic et al., 2004), but these measures bring into question whether the work is truly testing network theory. Furthermore, a recent article by Helliwell (2009) contradicts the network theory premise asserted by Pescosolido and the idea that religious network hubs serve as areas of greater protection against suicide. Rather, he concluded that religion is in fact more protective against suicide in less religious areas of a country.

Another theory is the ecological systems theory that was developed by Bronfenbrenner (1986). This model has been extensively used in academic scholarship since its creation. Bronfenbrenner suggested in his original article that various factors influence both families and the individuals that form the family.

He proposed that in order to properly understand a family or person, influences from both mesosystems (i.e. systems to which one is directly connected) and exosystems (i.e. systems to which one is indirectly connected) need to be taken into consideration. Furthermore, Bronfenbrenner suggested that research studies should use chronosystems – models that look at an individual’s development in a specific environment over time. These proposals were widely accepted and have widely influenced how social science research is conducted.

Having been used as a guiding theory in thousands of research articles, Bronfenbrenner’s work proves difficult to critique. However, one shortcoming that may be highlighted is that his theory is not necessarily a ‘theory’ according to some definitions of the word. By way of elaboration, the purposes of a theory are as follows: Accumulation, precision, guidance, connectedness, interpretation, prediction, and explanation (White & Klein, 2008). While this theory has certainly been used to guide research, as well as interpret results and explain phenomena, it is lacking in the areas of precision, connectedness, and prediction. With regards to precision, the ecological systems model is more of a sweeping global theory than a precise way of explaining specific events. Because of this, the theory has been used extensively by many disciplines, but that has led to a lack on connectedness in the findings. Furthermore, because of its lack of precision and connectedness, the ability to predict findings is somewhat compromised. Although it may not meet all the requirements of a theory, the ecological systems theory heavily influences many disciplines in academic writing.

Along with the ecological systems theory (Bronfenbrenner, 1986), the ecological risk/protection theory (Bogenschneider, 1996) has also been widely used, but it too fails to fit the purest definition of a theory. In her original article, Bogenschneider (1996) proposed that one way to address the challenges of youth development research was to focus on accumulating risk factors that lead to dangerous behaviors, and gathering protective factors that promote healthy development. As can be noted from this short description, the risk/protection theory is more of a research model than a testable theory. However, extensive use of this research approach has been adapted to address a variety of social problems, including suicide (e.g., US Department of Health and Human Services, 2001). Perhaps its widespread use is due to its ability to guide research and organize findings in a straightforward and simple manner.

Durkheim's social integration theory (1897) and Pescosolido's network theory (1989) will not serve as primary theoretical foundations for this project. The reason Durkheim's theory will not be the focus of this research is because approximately 95% of the respondents in the dataset are Catholic, thus inhibiting a proper comparison of integration and suicidal ideation between members of different religions. Likewise, Pescosolido's network theory will not be of primary use because the dataset does not have the proper variables to test such a theory. Specific information on networks is not provided in the data, and neither the individuals' relation to these networks or their level of influence was measured.

The theories that will serve as the theoretical foundations for my research are Stack's religious commitment theory (1983), Bronfenbrenner's ecological

system's theory (1986), and Bogenschneider's risk/protection theory (1996). The needed measures associated with Stack's theory are available in the dataset, as other studies have used the same or similar variables (e.g., Clark & Schellenberg, 2006; Wills et al., 2003). Furthermore, religious commitment theory and the ideas stemming from it (internal vs. external religiosity) are frequently used in modern social science research (Fiala, Bjorch, & Gorsuch, 2002; Nasim et al., 2006; Piko & Fitzpatrick, 2004; Resnick, Ireland, & Borowsky, 2004; Van Den Bree, Whitmer, & Pickworth, 2004), whereas Durkheim's original ideas have received less attention as time has passed.

Likewise, ecological systems theory is often used in suicide research because of the multi-faceted nature of the phenomenon (e.g., Kidd et al., 2006; Morrison & L'Heureux, 2001; Zayas et al., 2005). More specifically, this theory has driven recent research projects looking at sexual activity and culturally diverse participants with low SES and serious mental health issues (Corcoran, 2000; Corcoran & Franklin, 2002) – variables of particular interest to this study. Ecological systems theory will also be valuable to this particular project because of its international focus, and hence the need to consider community, familial, and personal factors.

Finally, Bogenschneider's risk/protection theory (1996) will be used to help guide this research because, due to an inability to collect first-hand data after the event, scholars studying suicide have embraced this approach as a primary method of understanding potential motivations, circumstances, and choices leading to suicide (e.g., Borges et al., 2008; Borges et al., 2009; Gonzalez-Forteza

et al., 1998). In addition, national suicide strategies and reports have used this method to guide their arguments for social action and additional research funding (Leitner, Barr, & Hobby, 2008; US Department of Health and Human Services, 2001). Furthermore, as Bogenschneider highlighted in her writings, this type of approach to research enables the information to be understood by a wider audience, helps policy-makers to avoid create policies based on common sense, and assists in the gathering and interpretation of findings (Bogenschneider, 1996). Therefore, using a risk/protective approach will facilitate the findings from this study to make a greater impact at local, national, and international levels.

In summary, Stack's religious commitment theory (1983) informs the research that will be conducted surrounding religiosity and suicidal ideation. By understanding the theory's premise that personal religious convictions are protective against suicide, this provides the backbone for hypothesizing about the importance of internal religiosity in the lives of adolescent students in Mexico. Bronfenbrenner's ecological system's theory (1986) informs the research that will be conducted focusing on migration and suicidal ideation. This theory emphasizes the importance of looking at a phenomenon from all perspectives (micro, mezzo, macro), and will thus guide the study looking at how the social environment (macro influence), family factors (mezzo influence), and suicidal thoughts (micro influence) work together to influence migration aspirations among youth in Guanajuato. Lastly, Bogenschneider's risk/protection theory (1996) will inform the research looking at sexual behavior and suicidal ideation. As certain sexual behaviors have been identified as risk factors in previous studies using this

theoretical model (Cash & Bridges, 2009; Goldner, Grande, & Taylor, 2009; Legleye et al., 2009; Ullman & Najdowski, 2009), this serves as a guide to the hypothesis about the influence sexual behaviors have on suicidal ideation among youth in Mexico.

Overview of the Literature

“Suicide is probably as ancient as man himself” (Rosen, 1971, p. 267).

The action of taking one’s life is recorded in some of the most ancient documents we have - among them, the Bible. Additionally, there are records of suicides that occurred in many nations of the world more than 2,000 years ago, throughout the middle ages, and throughout history (e.g., Greece, Egypt, Italy, France) (Rosen, 1971). As suicide is not a new problem, there is a large body of research literature that has focused on mezzo and micro-level risk and protective factors. These studies have helped researchers and policy makers better understand why people commit suicide. A report issued by the US government summarized years of research studies focusing on risk and protective factors (US Department of Health and Human Services, 2001). Their findings (as shown below) organize suicide risk factors into 3 categories while grouping all protective factors together:

Risk Factors for Suicide

- *Biopsychosocial*
 - Mental disorders, particularly mood disorders, schizophrenia, anxiety disorders and certain personality disorders
 - Alcohol and other substance use disorders
 - Hopelessness

- Impulsive and/or aggressive tendencies
- History of trauma or abuse
- Some major physical illnesses
- Previous suicide attempt
- Family history of suicide
- *Environmental*
 - Job or financial loss
 - Relational or social loss
 - Easy access to lethal means
 - Local clusters of suicide that have a contagious influence
- *Sociocultural*
 - Lack of social support and sense of isolation
 - Stigma associated with help-seeking behavior
 - Barriers to accessing health care, especially mental health and substance abuse treatment
 - Certain cultural and religious beliefs (for instance, the belief that suicide is a noble resolution of a personal dilemma)
 - Exposure to, including through the media, and influence of others who have died by suicide

Protective Factors for Suicide

- Effective clinical care for mental, physical, and substance use disorders
- Easy access to a variety of clinical interventions and support for help-seeking

- Restricted access to highly lethal means of suicide
- Strong connections to family and community support
- Support through ongoing medical and mental health care relationships
- Skills in problem solving, conflict resolution, and nonviolent handling of disputes
- Cultural and religious beliefs that discourage suicide and support self-preservation

Most people will experience a few of these risk factors sometime during their lives; however, individuals that struggle with a large number of risk factors at the same time - while not having the safeguard of the protective factors – are at the highest risk of suicide (Moscicki, 1995).

Suicide has been deemed problematic for a variety of reasons. As aforementioned, there is a great economic burden placed on families, communities, and nations. In fact, for the year 2005, economists estimated the financial burden of suicide in the US to be broken down as follows: \$3.7 billion due to medical expenses, \$27.4 billion due to work-related losses, and \$80.2 billion due to quality of life losses (Miller et al., 1999). The total estimated lost revenue due to suicide in 2005 was equal to 7% of the entire US federal budget of that same year (Congressional Budget Office, 2010). From solely an economic standpoint, reducing suicide would lead to a significant financial boost to a country's economy.

However, the economic impact of suicide is only a small part of the problem. Many people's lives are affected because of the negative psychological

and emotional impact caused by the suicide of a family member, friend, co-worker, or acquaintance. Research has shown that suicide bereavement is unique and different than bereavement after a natural death (Jordon, 2001). For example, some studies have shown higher levels of anxiety among family members grieving a death by suicide when compared to a natural or accidental death (Farberow et al., 1987). Other findings have demonstrated that when a student commits suicide, there is a strong emotional reaction among friends and fellow students, especially with those who were already depressed or who were already contemplating suicide (Brent et al., 1989). Indeed, even mental health and community workers - professionals who are frequently in contact with people struggling through serious problems - have reported increased stress and emotional disruption in their lives when a client commits suicide (Brown, 1987; Kleespies, Smith, & Becker, 1990). These emotional and psychological issues lead negatively impact all people linked to the victim.

Many sociologists (including Durkheim) view societal factors as the driving force behind people committing suicide (Kushner, 1984). Indeed, factors such as gender roles are integral in shaping behavior (Moon et al., 1999; Slater et al., 2001). As this study is focused on both male and female youths who live in a unique international migration community of Mexico, a few comments on Mexican society is warranted. Much has been documented on “Machismo” and “Marianismo” in Mexico (e.g. Marsh & Myers, 1986; Ricciardelli & Williams, 1995). While there are positive and negative aspects of both terms (Kulis, Marsiglia, Lingard, Nieri, & Nagoshi, 2008), stereotypical interpretations

regarding Mexican culture are prevalent, viewing male behavior as aggressive and controlling, and female behavior as submissive and dependent (Gutmann, 1996; Hardin, 2002 Kulis et al., 2003, 2008). Such views of gender roles are expected, promoted, and endorsed by large populations in Mexico (Jelin, 2005; Kulis et al., 2008; Reyes Luna et al., 2004; Rocha-Sanchez & Diaz-Loving, 2005). Indeed, while such stereotypes are strongly exaggerated, international comparisons to non-Latin American countries do show Mexico scoring somewhat lower on levels of societal individualism (i.e. Mexico is a more communal country), and much higher on societal masculinity scales (Lirio et al., 2007).

Among men and women in Mexico, equal economic opportunity and advancement has an obvious gender gap. As Cortez (2001) highlighted, there is a plethora of evidence since the 1980s showing increasing wage inequality between men and women. In addition, when compared internationally to both Latin American and non-Latin American countries, Mexico has a much lower number of women in the labor force (Lirio et al., 2007). While such gaps are evident, Kulis et al., (2008) explain that migration and globalization are impacting such cultural norms, and noticeable change is underway. They highlight that longstanding traditional gender expectations and employment rate gaps have begun to decline in recent years.

While youth participants in this study have grown up with traditional Mexican values and norms all around them, they are also being exposed to an ever increasing world of globalization while living in a community with strong migratory roots to the US. In addition to the primary topics of interest guiding this

research, this study will provide interesting insights into the differences between Mexican boys and girls of the upcoming generation.

Religiosity and Suicide

The foundation for suicide research was set forth by the well-known French Sociologist Emile Durkheim. The studies conducted by Durkheim focused primarily on the connection between religious affiliation and suicide (Durkheim, 1897). He reasoned that the Catholic Church's strong sanctions against suicide - as well as its integrated traditional structure - served as deterrents against suicide amongst its members (Colucci & Martin, 2008). In comparison, the religious freedom of thought and lack of integration amongst Protestant members was his explanation for their higher suicide rates (Durkheim, 1897).

Since Durkheim's groundbreaking book in 1897, many suicide theorists have critiqued and broadened his original ideas. Amazingly, despite the countless critiques of his original work, numerous contemporary suicide theorists continue to use Durkheim's thoughts and themes in their own studies, and some have even found evidence to support his original findings (Colucci & Martin, 2008; Pescosolido, 1990; Pescosolido & Georgianna, 1989; Stack, 1983; Stark, Doyle, & Rushing, 1983; Thomas, 2000).

While not the first, some of the most significant challenges and alterations of Durkheim's original study came in the early 1980's. In a recent review, one of Steven Stack's articles from 1983 and one of Rodney Stark's articles from that same year were highlighted as two of the most influential suicide writings since Durkheim (Colucci & Martin, 2008). Stark, Doyle, and Rushing (1983) asserted

the idea that it is not the actual religion that one belongs to that decreases suicide risk, but rather it is the level of commitment to your religion. In a similar line of reasoning, Stack (1983) found that the protective influence of religion against suicide may be the specific beliefs that are taught (e.g. belief in afterlife or the belief that suffering has a purpose) rather than the dynamics of the religious organization. While both these arguments gained support and influenced the study of suicide, additional findings continued to arise that seemed to support Durkheim's original work.

One such study was conducted by Pescosolido and Georgianna (1989). In their work, they examined religious affiliation and suicide rates using data from 1970. Their findings supported Durkheim's work in that Catholic denominations exerted a protective effect against suicide, and they also found that members of the Protestant denominations were at higher risk for suicide (Pescosolido & Georgianna, 1989). Instead of fully supporting Durkheim's original ideas, they added to them and explained their findings through the use of network theory (Colucci & Martin, 2008). As explained in her future work on suicide, Pescosolido (1990) said that there was a belonging aspect to religion, and that the network relationships and ties among members of certain religions and religious communities were the foundation for the protective influence of religion against suicide.

Recent studies looking at the impact of religion on different outcome measures draw on all the contributions from Durkheim, Stack, Stark, and Pescosolido. This new body of research includes measures of religious affiliation

(Curlin et al., 2008; Parsai, Marsiglia, & Kulis, 2010), internal religiosity (i.e. personal beliefs or convictions) (Gillum, Sullivan, & Bybee, 2006; Nasim et al., 2006), and external religiosity (i.e. attending church meetings or activities) (Ellison, et al., 2007; Fiala, Bjorck, & Gorsuch, 2002). It is important that these differences be understood. Durkheim and the earlier religious research focused primarily on church affiliation (e.g., Catholic, Protestant, etc) (Durkheim, 1897). External religiosity does not take into consideration which denomination or organization one attends, but rather how frequently they go to any church or any religious activity. Furthermore, internal religiosity is different from both religious affiliation and external religiosity in that someone with strong levels of internal religiosity may not even belong to a church or religious denomination, yet they may have a strong belief in a higher power, pray daily, and study religious materials (e.g., scripture). As can be seen, the combination and use of these different variables is a testament to the complexity and progress being made in the area of religion on suicide.

One aspect of this line of research that has been largely ignored is the relationship between non-Christian religions and suicide. While this idea has not been completely overlooked (e.g., Ghorpade, Lackritz, & Singh, 2008), no articles were found specifically looking at the influence of religion on suicide rates among non-Christian populations, although they have included non-Christian faiths in some of their analysis (Pescosolido, 1990). Indeed, this shortcoming has been noted by previous researchers, and highlighted as an area deserving further attention (Ellison, Burr, & McCall, 1997).

When looking at religiosity and suicide in Mexico, it is important to understand the powerful influence that the Catholic Church has had on the nation's culture. In fact, Hovey (1999) highlights that Catholicism has been ingrained so deeply into the Mexican culture that religious ceremonies such as baptism and communion are considered social events. It should be noted that these social events would fall under the umbrella of external religiosity, and attendance at such events is not necessarily a reflection on a person's level of faith, belief in the church's teachings, or adherence to the church's spiritual principles (internal religiosity). However, many people are influenced by the church's teachings and spiritual guidance, and for them the church's stance toward suicide is firmly set forth. In the Catechism of the Catholic Church, suicide is said to not only contradict an individual's duty to love God and love their neighbor, but also to go against moral law (Catechism of the Catholic Church, 2006). Knowing that the Catholic Church has held a firm stance against suicide for many years (Colucci & Martin, 2008), one might assume that, while not everyone adheres to the church's teaching, a negative cultural perception of suicide may be part of the reason that Mexico has such a low suicide rate.

After studying religion across many countries, Helliwell (2009) concluded that religion is more protective against suicide in less religious countries, as well as in less religious areas of a country. As Mexico is one of the more religious countries, their conclusion would suggest that religiosity would have a weak influence among Mexican citizens. However, this line of thinking somewhat contradicts previous research conducted by Pescosolido (1990). In her study,

Pescosolido found that areas of historical Catholic strength were more protective against suicide than regions of less historical Catholic strength. This disagreement in the literature, as well as the ongoing debates surrounding the protective influence of internal versus external religiosity, are supportive of the assertion by Colucci and Martin (2008) that international studies in countries such as Mexico are needed to better understand the true relationship between religion and suicide.

Migration and Suicidal Ideation

When compared to religiosity and suicidality, the relationship between suicide and migration has a much smaller body of research. Historically, migration from Mexico to the US has been motivated by economics – specifically, limited access to a living wage in Mexico coupled with the hope for opportunity in the US (Alba, Massey, & Runbaut, 1999). Men are more likely to migrate than women, in part because parents tend to invest more heavily in the education of their daughters (with the expectation that they will stay in Mexico) while the boys are more often socialized to migrate (Wolseth & Babb, 2008); however, this notion is somewhat controversial as some think that parent's invest more in the education of their boys. In Central Mexico (i.e. Guanajuato, Jalisco, Michoacán) there is a long history of migration to the US, and the community expectations of youth are intertwined with a lifestyle of migration (Massey, Durand, & Malone, 2002). In fact, boys who do not migrate may be perceived as lazy, un-enterprising, and even undesirable as mates; thus, youth often grow up investing less (psychologically) in Mexico, and more in the idea of life in the US (Kandel & Massey, 2002).

Most of the migration literature now agrees that the key factors motivating migration are human capital investments, SES, family, and social networks (Kanaiaupuni, 2000). While the impact of these influences abound in the literature, other motivations to migrate are worthy of attention. Indeed, individuals may have multiple reasons for migrating. By identifying other driving forces behind Mexican migration and recognizing how the different factors coincide, additional insights can be gained which will help US and Mexican policy creators better understand and predict migration.

Suicide is one such factor that has received only a small amount of attention in the migration literature. Studies in the US have concluded that migration may increase the risk of suicide because of the difficulties incurred from severing ties to loved ones, having to learn a new language, and experiencing feelings of not belonging (Hovey, 2000). Indeed, one such study found that immigrants in the US have overall higher rates of suicide than US born Hispanics (Wadsworth & Kubrin, 2007). This same pattern was found in research looking at Soviet Union and Israeli migration (Ponizovsky, Ritsner & Modai, 1999). That study also reported that immigrants had higher rates of suicidal ideation than the general population. A Canadian project, while not focusing necessarily on international migration, did find a relationship between mobility and suicide (Potter et al., 2001). The results indicated that changing residence within the past year was positively associated with near lethal suicide. The acculturation/assimilation literature supports the idea that those who migrate and struggle with acculturation issues tend to also struggle in various areas that impact

their mental health (Marsiglia & Waller, 2002). While these studies provide a foundation from which to start looking at migration and suicide, their findings only shed light on part of the phenomenon.

Each of the aforementioned studies looked at individuals after they had migrated; however, they failed to consider the migrant's mental state prior to leaving. The idea that factors preceding migration may be the cause of suicidal ideation among immigrants was recently set forth by Helliwell (2007). This thought gains additional traction when considering the societal pressure put on individuals in high migration communities throughout the world, like in the Mexican state of Guanajuato (Massey, Durand, & Malone, 2002). Considering the mental health of the individual before they migrate connects back to the healthy migrant theory (Shai & Rosenwaike, 1987; Sorlie, Backlund, Johnson, & Rogot, 1993) which asserts that the healthiest individuals are those that eventually migrate. While this theory was originally designed to explain physical health differences, it may apply to mental health as well. Perhaps those that are not able to migrate have poorer mental health than their migrating peers. Studies that focus on the mental health of individuals living in high migration communities will give us greater understanding about the relationship between suicidal ideation and the migration process, and would begin to fill this gap in the migration research literature.

Sex and Suicide

Yet another area of suicide research that has been understudied, especially among Latino populations, is the relationship between suicidal ideation and

sexual behavior. A recent study found that sexual activity is a major risk factor for suicidal ideation (Legleye et al., 2009). However, in the same article, the authors emphasize that the role of sexual behavior is not fully clear. This same sentiment is reflected in other writings on risk behaviors, depression, and suicide (Hallfors et al., 2004). A considerable number of works in the US have been put forth on the topics of sex and suicide, but studies in Mexico are extremely limited.

Lately, a substantial body of US research has focused on the relationship between child sexual abuse (CSA) and suicide (Goldner, Grande, & Taylor, 2009; Ullman & Najdowski, 2009). The findings from these studies indicate that CSA increases both suicidal ideation and suicidal behavior. While this has received considerable media attention, the authors stress that the percentage of variance explained by CSA was extremely low, and that the impact of CSA was not as strong as may be interpreted by the general public (Goldner, Grande, & Taylor, 2009).

Also receiving attention in the US is the relationship between homosexuality and suicide. This topic has gained considerable interest as many states are debating whether or not they should allow same sex couples to get formally married (New York Times, 2010). Some studies have found that homosexuality and bi-sexuality (especially among men) increases suicide risk (Remafedi et al., 1998; Cash & Bridges, 2009). However, there has been a strong debate in the research literature as to the reasons behind such associations (Remafedi, 1999).

Further studies in the US have found additional sex-related behaviors to also be linked to suicide. Kirby (2002) found that having been pregnant (or having caused a pregnancy) was related to suicide attempts among adolescents. King, Schwab-Stone, and Flisher (2001) reported that sexual activity among youth was associated with higher suicidal ideation, and various studies have found that sexual behaviors linked with substance abuse also increases the risk of suicide (Hallfors et al., 2004; Burge, Felts, Chenier, & Parrillo, 2009).

Although there have been a decent amount of research on sex and suicide in the US, the topic has not been extensively studied in Mexico; however, this is not necessarily surprising given the fact that the suicide rate in Mexico is substantially lower than most other countries (Helliwell, 2007; Puentes-Rosas, López-Nieto, & Martínez-Monroy, 2004). One study that did focus on these factors in Mexico looked at CSA and suicide, and ultimately reported similar findings to those previously highlighted in the US (Forteza, Lira, Brabila, & Villarreal, 2001); however, no research was found focusing on the link between suicide and the other sexual factors that were identified in the US literature. The closest model currently available to understanding Mexican suicide with relation to sexual activity comes from the work of Dr. Zayas from the University of Washington in St. Louis. His research team formed a hypothesis that seeks to explain the connection between sex and suicide among Latina teens in the US (Zayas, Lester, Cabassa, & Fortuna, 2005). Zayas explained that sexual behavior among youth Latina girls put a strain on the family relationships, thus leading to parent-child conflict and depression, both of which are strong predictors of

suicide. While this model of sex and suicide among Latina youth in the US is a good foundational starting point for research in Mexico, without Mexican data it is impossible to generalize the findings on an international scale.

Literature Review Summary

The literature in each of the areas of emphasis previously highlighted has a common gap: A lack of quality studies in settings outside of the US - especially in Mexico. This shortcoming needs to be addressed, and has frequently been highlighted as a problem due to the conflicting results among the few international studies that are available (Colucci and Martin, 2008; Helliwell, 2007; Leitner, Barr, & Hobby, 2008). The lack of information on suicide among Mexican youth living in Mexico is a primary motivating factor for the current research project; however, it is not the only deficiency in the literature. Additional gaps in each of the aforementioned areas of study are outlined below.

While the connection between international mobility and suicidal ideation has previously been studied (e.g. Ponizovsky, Ritsner & Modai, 1999; Wadsworth & Kubrin, 2007), much more research is needed in order to fully understand the connection. As aforementioned, Helliwell (2007) set forth the idea that perhaps factors preceding migration could be the cause of high suicidal ideation among immigrants. This question is yet to be addressed, largely because previous studies have focused their research on people who have already migrated. Knowing the mental status of migrants before they left their home country is necessary to see if the migration experience is the primary cause of suicidal thinking. As the research currently stands, it is unknown whether suicidal thinking results from moving,

disappointed expectations after migration, or whether the suicidal thoughts triggered the initial desire to migrate.

The connection between religiosity and suicidality has repeatedly been studied over the past 100 years, but recent studies have highlighted some gaps in the existing literature that need to be addressed. Gearing and Lizardi (2009) concluded their recent article by emphasizing the need to not simply look at religiosity and suicidality, but to also include in these same models variables for gender, age, and culture. Furthermore, while studies have often focused on comparing religious groups (e.g. Durkheim, 1897; Stark, Doyle, & Rushing, 1983), Hilton, Fellingham, and Lyon (2002) point out that more studies focusing on the religion/suicide relationship among individuals of the same faith are needed. Lastly, there are very few studies looking at religion and suicide attempt (Dervic et al., 2004), and just as limited a number looking at religion and suicidal ideation.

As mentioned previously in this document, recent studies have highlighted that the role of sexual behavior as a risk factor for suicide is uncertain (Legleye et al., 2009). After a review of the literature, the relationship between sexual behavior and suicide is particularly unclear among non-white populations. Very few studies have looked at this relationship with Latino samples, and the little data that does address other groups has been collected in the US, thus inhibiting the ability to generalize the findings to an international audience (e.g. Perkins, Luster, Villarruel, & Small, 1998; Zayas, Lester, Cabassa, & Fortuna, 2005). Furthermore, the focus of the sexual behavior and suicide literature has centered

on issues of sexual orientation and abuse, but not sexual activity (Gilman et al., 2001; Gonzalez-Forteza, Brambila, & Villarreal, 2001; Goldner, Grande, & Taylor, 2009; Ullman, & Najdowski, 2009).

The greatest contribution of this study is its use of international data collected from youth in Central Mexico. Additionally, it is addressing the aforementioned gap in the migration literature of not knowing the mental status of immigrants before leaving their home country. While the data for this project is not longitudinal, thus prohibiting the research team from tracking those who choose to migrate, it will focus on the mental status of those with migration aspirations. With regards to the religiosity literature, one highlighted gap was the lack of focus on gender and age. Both of these variables will be included in the models and discussed in light of their influence on the outcome. Lastly, the lack of studies on sexual behavior and suicide among Latino populations in countries throughout the world (including Mexico and the US) will be addressed through the use of international data.

Research Questions

The primary research question driving this study is, “What is the relationship between suicidal ideation and migration aspirations, religiosity, and sexual behavior among Mexican youth living in Guanajuato?” The three research questions and their corresponding hypotheses are as follows:

Question: Is there a connection between suicidal ideation and migration aspirations?

Hypothesis: Higher levels of suicidal ideation will be associated with lower levels of migration aspirations.

Rationale: This hypothesis is theoretically derived because it was formed after considering the macro influence of living in Guanajuato, the mezzo influence of family life in Guanajuato, and the micro influence of suicidal ideation. The community pressure to migrate is extremely strong in Guanajuato (Kandel & Massey, 2002; Massey, Durand, & Malone, 2002), and that is coupled with pressure from parents regarding compliance with these norms (Wolseth & Babb, 2008), so those who don't have those desires will feel greater pressure from the community and their families. Furthermore, in light of the healthy migrant theory, those who migrate have historically been found to have overall better health (Shai & Rosenwaike, 1987; Sorlie et al., 1993), so it may be assumed that those who have migration aspirations may also have stronger mental health.

Question: Is there a relationship between suicidal ideation and sexual behavior?

Hypothesis: Higher levels of sexual behavior among youth will be associated with higher levels of suicidal ideation.

Rationale: As highlighted in the previous question, the risk factors compiled using Bogenschneider's risk/protection theory (1996) in

the literature have consistently pointed to sexual behavior being a risk factor for suicide, suicidal behavior, and suicidal ideation (Cash & Bridges, 2009; Goldner, Grande, & Taylor, 2009; Legleye et al., 2009; Ullman & Najdowski, 2009). Hence the hypothesis for this study among Mexican youth coincides with the findings from the international research previously conducted.

Question: What is the association between suicidal ideation and religiosity?

Hypothesis: Higher levels of internal religiosity will be associated with lower levels of suicidal ideation.

Rationale: This hypothesis is based on Stack's original ideas surrounding religious commitment theory (1983), as well as research surrounding internal religiosity since that time that has found personal beliefs and convictions to be protective against suicide (Gearing, & Lizardi, 2009; Neeleman & Lewis, 1999; Stark, Doyle, & Rushing, 1983).

Methodology

I will be conducting a secondary data analysis using survey data that were collected in 2007 from students enrolled in an alternative high school program. At the time of data collection, there were 252 program centers in 38 municipalities with more than 25,000 enrolled students. Eight centers were randomly selected from 137 centers located in 20 municipalities within a 100 km radius of León, Guanajuato. Under the direction of the university research team, surveys were administered by teachers and/or psychologists in each center. Of the 702 students

who participated in the study, 60% were female and 40% were male. Participants' ages ranged from 14 to 24 years, although 90% were between 14 and 18 years old, the typical age for secondary education. The Arizona State University Internal Review Board has approved research projects using this data under exempt status 7.4. The program is designed for students who cannot afford, or do not live near, a traditional high school. The majority of students attending these alternative schools come from families with limited resources who live in rural or semi-rural areas of Guanajuato. The measures used were tailored for the Mexican adolescent population as straightforward questions and uncomplicated response categories were used to ensure understanding on the part of the participants. These relatively simple response formats have been shown to work well with migrant Spanish-speaking populations from Mexico (Knight et al., 2009).

Kiecolt and Nathan (1985) suggest that the primary advantages of conducting secondary data analysis are that it is less time consuming, requires less personnel, and costs less than other methodologies. Furthermore, the authors state that there are a plethora of datasets readily available to researchers, and many new and interesting findings can come from datasets that may have been originally designed to answer very different research questions. Cook (1974) notes that secondary evaluations provide fresh and unique perspectives, and the findings are usually free from the suspicion that they were simply published to please the funding source. Unfortunately, the datasets that are available may not have the variables, scales, or constructs that are needed to answer certain research questions (Kiecolt & Nathan, 1985). Also, there is a lack of familiarity with how

the original data was collected and the problems that were encountered (Cook, 1974), as well as a general disconnect from the people and the location from which the information was gathered.

I have chosen this research design not only because of its advantages, but also because many of the aforementioned limitations will not impact this study. With regards to the advantages, in addition to saving time and resources, I have already been granted permission to use the dataset. With no need to collect, enter, or clean data, and with survey responses from over 700 participants, a secondary data analysis was an easy choice for this project. With regards to the limitation mentioned by Kiecolt and Nathan (1985) about secondary datasets often lacking the desired scales, variables, and constructs, the dataset that I will be using has many of the measures that are necessary for a strong analysis. Furthermore, the limitation mentioned by Cook (1974) regarding a lack of familiarity with the procedures surrounding the planning and implementation of the project is not applicable in this situation due to my familiarity and acquaintance with the research center and the people that conducted the original study in Guanajuato. Overall, the choice of research design was a simple decision given the many advantages and few limitations.

Suicidal Ideation and Migration Aspirations

In order to test the 1st research question (Is there a connection between suicidal ideation and migration aspirations?), a linear regression will be conducted. The dependent variable, migration intentions, will be created by combining three questions (Would you like to live in the United States some day?

Would you like to work in the United States some day? I am thinking about migrating to the United States some day). Responses to the first two questions range from 0=Not at all, to 3=Yes, a lot. The third question's responses range from 0=Definitely not, to 3=Definitely. When scaled together, the internal reliability was found to yield a Cronbach's alpha of .788. While this particular scale has not been used previously it was included as part of the pilot-test, and the questions "would you like to live in the US some day," and "would you like to work in the US some day" have both been asked in previous studies among Mexican populations (Kandel & Massey, 2002).

The predicting variable of interest is suicidal ideation. This measure asks, "During the past week, how frequently did you: 1) Feel that you could not go on, 2) have thoughts about death, 3) feel that your family would be better off without you, 4) think about killing yourself." There were 4 response categories: Not once, 1-2 days, 3-4 days, 5-7 days. When scaled together, the internal reliability was found to yield a Cronbach's alpha of .777. This scale has been used in previous studies conducted in Mexico (González-Forteza et al., 1998).

Other variables for this study would be as follows: Gender, age, socioeconomic status (SES), parent-child relationship, whether or not the respondent has ever been to the US, place of birth, and whether or not the respondent's relatives have ever been to the US. Gender will be included in the regression because research has shown that boys and girls have different social norms and receive different messages about migration from their parents and the community (Kandel & Massey, 2002). Age will be included in the model because

thoughts and plans regarding migration will likely be different between a 14 year old respondent who just started high school and a 17 year old respondent who is just about to finish. SES has consistently been found to be a significant predictor of migration intentions among Mexican populations (Alba, Massey, & Rumbaut, 1999; Martin & Widgren, 2002), and was measured by asking the respondents, “In your home, is there enough money to: Buy food, buy gasoline for your car or truck, pay for basic services (light, water, etc), buy clothing you need, do fun things (take vacations, go to the movies, go out).” The responses categories were 1=Never, 2=Sometimes, 3=Almost always, and 4=Always. A measure of parent/child relationship is being included in the models because the quality of this relationship may influence a youth’s desire to leave home (e.g. due to a bad relationship with their parents). This measure was created from two questions: “How would you describe your relationship with your mother,” and “how would you describe your relationship with your father.” Responses ranged from 1=Bad to 5=Excellent. The mean of both responses was calculated for each child; or, if they only had one parent, the score from the one parent was used. The measure addressing place of birth is being included because Guanajuato is such a unique state in Mexico. Youths who grew up in a family with a history of exposure to the culture and lifestyle of migration around them will have a different mindset about migration than others who were not exposed to such norms. This variable asked: “Where were you born?” Response options were dichotomized into two categories: 0) Born in Guanajuato, and 1) Not born in Guanajuato. Lastly, also to be included in the model are two questions asking whether or not the respondent

or a family member had been to the US. Having been to the US previously, or knowing a family member who had, would likely influence whether or not the student has migration aspirations – especially in a community like Guanajuato with a long history of circular migration (Massey, Durand, & Malone, 2002). The work of Massey et al. (1993) and Menjivar (1995) regarding social networks gives further credence to the inclusion of these variables. Massey (1993) defines social networks as “sets of interpersonal ties that connect migrants, former migrants, and nonmigrants in origin and destination areas through ties of kinship, friendship, and shared community origin” (p. 447). He says that each migrant helps reduce both the costs and risks of future migration, thus increasing the size and sustainability of the network. Menjivar (1995) adds that Mexican migration networks to the US are well supported. While she mentions that not all social networks expand and grow over time, she says that the informal networks among Mexican citizens are some of the strongest.

As this is a secondary data analysis, not all the desired variables were available for analysis. One such variable is previous suicide attempt. The suicidal ideation variable only asks about feelings and thoughts during the previous week. If a variable asking about previous suicide attempt were available, a clearer picture of the association between suicide and migration aspirations would be understood. Along those same lines, length of time since last suicide attempt would be a good follow-up question. Having had a suicide attempt within the past year would potentially impact your migration aspirations more than having had a suicide attempt 5 years ago. Lastly, a question asking how much time the

individual planned to stay in the US (if they had migration aspirations) would help tease out those who were solely wanting to earn a bit of money or enjoy a short vacation from those who desired to permanently leave and stay in the US.

Suicidal Ideation and Sexual Behavior

To answer the research question concerning suicidal ideation and sexual behavior, a logistic regression will be used. Due to the skewed distribution of the dependent variable - suicidal ideation - the measure will be made dichotomous (0=No suicidal ideation during the past week, and 1=Suicidal ideation present during the past week). The independent variables of interest for this model are 1) ever having sexual relations (“Have you ever had sexual relations?”), and 2) age of first sexual encounter (“How old were you when you had sex (sexual relations) for the 1st time?”). Other variables to be included in the model are the following: Gender, age, SES, parent-child relationship, place of birth and living arrangement. Gender differences surrounding age of first sexual encounter have been recognized as a biological predisposing factor for many years (Tucker et al., 1994). Additionally, it is widely recognized that females are much more likely to struggle with suicidal ideation than are males (Zayas, 2000; Zayas et al., 2005). Furthermore, age is an important control when asking about ever having sexual relations because the older students have had more time to engage in sexual behavior. This same logic applies to age and suicidal ideation – more life experience leads to greater opportunity to struggle with suicidal thoughts. As for the other variables, recent studies have found that low SES (among racial minorities) and living in a single parent household are both risk factors for early

onset of sexual relations among youth (Santelli, Lowry, Brener, & Robin, 2000). Low SES and living in a single parent household have also been identified as risk-factors for suicidal ideation (US Department of Health and Human Services, 2001; Weitoft, Hjern, Haglund, & Rosen, 2003), and thus will both be included as variables in the analysis. Lastly, stronger parent-child relationships have been shown to reduce high-risk sexual behaviors and suicidal ideation (Blake et al., 2001; US Department of Health and Human Services, 2001).

Variables not available that would have strengthened this paper (in addition to the additional suicide variables that were previously mentioned) include a question aimed at differentiating consensual sexual relations from sexual abuse. By only asking if the participants had ever had sexual relations, those who were forced to have sex and those who voluntarily engaged in such behaviors must be analyzed as if they were the same. Furthermore, a question asking about sexual orientation would have enhanced this study as there is a line of research focused specifically on the relationship between sexual orientation and suicide (e.g., Remafedi, 1999; Remafedi et al., 1998).

Suicidal Ideation and Religiosity

In order to address the research question surrounding suicidal ideation and religiosity, logistic regression will again be used as the statistical method of analysis. The dependent variable will again be suicidal ideation, with the primary independent variables being internal and external religiosity. Internal religiosity was measured by asking, “How important is religion to you?” Responses ranged from 1=Not important to 4=Very important. External religiosity was measured by

asking, “How often do you attend religious services at your church, mosque, synagogue, or temple?” Responses ranged from 1=Never to 5=Every week. Other variables to be included are as follows: Gender, age, SES, parent-child relationship, place of birth and living arrangement. As these variables and their relationship to the dependent variable in this model are the same as the variables used to answer the 2nd research question, the rationale for using them is essentially the same as outlined above; however, it is important to highlight some of the connections that have been found in the literature between religiosity (the primary independent variable) and these variables. Along with an abundance of articles, many books have been written on the relationship between gender and religion, including how religion differentially influences males and females (e.g. King, 1995; Sullins, 2006). Along with gender, age is an important factor when studying religiosity because of the influence parents have on children’s beliefs and church attendance (Hodge, Cardenas, & Montoya, 2001; Marsiglia et al., 2005). For this same reason, it is important to look at the living arrangement and the relationship between the child and his/her parents, and then identify how this might impact their level of religiosity. Lastly, looking at socioeconomic status in each of these articles is important because the sample was taken from an overwhelmingly low SES population.

As highlighted in the literature review regarding religiosity, the protective power of external religiosity has been explained by some researchers (Pescosolido, 1990; Pescosolido & Georgianna, 1989) as being due to the benefits of strong social networks. Therefore, by including a control for social networks in

this model I would be able to gain additional insight as to the accuracy of their theory. While this would be an interesting contribution to the literature, the secondary dataset being used does not have the needed variable(s) to look at the presence/strength of their social networks. One such reason for this is explained as follows: “Social network analysis is more a branch of ‘mathematical’ sociology than of ‘statistical or quantitative analysis,’ though social network analysts...practice both approaches” (Hanneman & Riddle, 2005, p.13). This statement echoes the thoughts and work of previous social network researchers (Borgatti, Jones, & Everett, 1998).

One social network variable from the dataset that was originally considered asked the student about the connection they feel to the school they are attending. While this is a good measure of the power of the connection to the school, it would be a poor measure to include in the aforementioned models. The reason being, whether they have a strong or weak connection to the schools does not account for other social networks they may have (e.g. online social networks, sports teams, friends who don't attend school, etc). While the limitations of the dataset make it impossible to adequately control for social networks, this does not jeopardize the ability of the study to contribute new knowledge. One reason for this is that, by building off the research already conducted by Pescosolido, we understand that the measure of external religiosity in and of itself is one measure of social networks. If it is found to be a significant predictor, then further research can build off this study and identify whether it is significant because of religious or social networks reasons. For this study, however, it is important to note that

previous research in this unique international environment has not looked at religiosity and suicidal ideation, and so the contribution of this study will be great even though the models do not control for social networks.

Another variable that would have enhanced this paper is a question asking how much religious teachings influence everyday decisions. Some studies have focused on the impact of religion on certain behaviors (McQuillan, 2004; Sprung et al., 2007), and the addition of this variable would have brought additional insight as to the direct impact of religious beliefs and teachings on the lives of the participants. Furthermore, as the internal and external religiosity measures were both single item measures, a scale would have provided a more accurate depiction of the participant's levels of internal and external religiosity.

Nesting

Since students from various centers located in different areas were sampled, possible nesting effects will be accounted for by controlling for clustering by school.

Tests of Moderation

As previously highlighted, adolescent boys and girls have very different roles and expectations in Mexican communities, especially in areas of high migration. Research has also been presented showing that rates of suicidal ideation between boys and girls are very different, specifically among the high school age group. Migration, religious, and sexual behavior differences between boys and girls have also been set forth. Because of this, gender will be tested as a moderator of the primary predictor and primary dependent variables in each of the

3 papers. In this way, intricate gender nuances will be brought forth and discussed in greater detail. This coincides with the recent recommendation from Colucci & Martin (2008) wherein they suggest using gender as a moderating variable in suicide studies.

Power

Power is important to consider when designing a study because low power can lead to an incorrect rejection of the null hypothesis, and inadequate power has been shown to be the reason behind incorrect findings in various infamous studies (Maxwell, 2004). It is important to note that academic discussion of statistical power is relatively new, and guidelines have thus been frequently altered in recent years (e.g., Green, 1991; Nunnally, 1978; Wampold & Freund, 1987;). Although there is some debate surrounding what constitutes adequate power, it is generally accepted that sufficient power = .80 (Elliot & Woodward, 2007). For this study, the proposed regression models in each paper have 7 predictors apiece. According to Maxwell (2000), a regression model with 7 predictors needs a sample size of 682 to have strong power. As this study had 702 participants, even if the final samples were to drop somewhat below 682, the models should still have adequate power to pick up relationships with medium effect sizes (Cohen et al., 2003).

Reliability and Validity

Reliability, in research terminology, is defined as consistency (Shadish, Cook, & Campbell, 2002), and is tested for to ensure quality measurement. While there are various ways to test measurement reliability (e.g. split-half, test-retest, inter-rater), I will be using Cronbach's Alpha, a conservative estimate of

reliability (Carmines & Zeller, 1979). Not only is this method frequently used in the literature (Yu, 2001), but the other methods require much more time and, as with test-retest, more resources. The Cronbach Alpha test “is a measure of squared correlation between observed scores and true scores” (Yu, 2001, p.246). An acceptable Cronbach’s Alpha for a particular measure is .7 and higher (Reader, Flin, Mearns & Cuthbertson, 2007), although lower scores are sometimes reported and used. As reported in response to question 3, each scaled measure in this study has a Cronbach Alpha score of at least .7.

Measurement validity is the extent to which a scale captures the abstract concept that it is intending to measure (Carmines & Zeller, 1979). Just as with reliability, there are many ways to test for validity (e.g. face validity, criterion validity, content validity, concurrent validity, etc). However, unlike reliability tests, validity assessments are much more subjective. For example, face validity is the extent to which members of the scientific community judge a measure to be valid. This test is therefore entirely based on opinion. While other tests of validity (e.g. predictive validity) are more objective, measuring validity is much more complicated than reliability. For this study, almost all of the measures have been previously used and published in academic journals, thus having already passed tests of face and content validity. However, one important scale that has not been previously used is the migration aspirations scale. The migration aspirations scale has two questions that have been used in previous studies, and they were combined along with a third question. In addition to the pre-test, preliminary analysis has shown the scale to have strong predictive and convergent validity.

The second type of validity is often referred to as internal validity, and that is the extent to which a causal inference can be made among variables (Shadish, Cook, & Campbell, 2002). As this study is a cross-sectional survey and not a longitudinal experiment, there are many threats to internal validity, thus eliminating the ability for statistical analysis to identify causal relationships.

The last type of validity is external validity, or the ability to generalize findings (Shadish, Cook, & Campbell, 2002). Fowler (2009) explains that in order to generalize survey research findings, random sampling needs to be used to select a sample of participants from a larger population. As Fowler further highlights, if a random sampling technique was used, then the findings can then generalize to the population from which they were drawn. For this project, as previously noted, the 8 participating schools were randomly selected from a larger pool of 137 schools. Therefore, the limit to which the findings can be generalized is to the 137 schools from which the 8 were randomly selected. Sometimes response rate can be problematic (Fowler, 2009), but for this study that is not a concern because the response rate was > 95%.

Limitations

As previously mentioned, due to the study design (cross-sectional survey) there are many threats to internal validity. In fact, a primary reason experimental designs were created was to minimize internal validity risks that are inherent in survey data (Shadish, Cook & Campbell, 2002). The primary internal validity threat in this project is that identifying directionality is not possible with this type

of study design. For example, we will not know if migration aspirations lead to suicidal ideation, or if suicidal ideation leads to migration aspirations.

Another limitation that is inherited from the secondary analysis study design is the inability to select which scales to use in order to measure the constructs of interest. The data has already been gathered, and consequently the decision of which scales to use has previously been determined. Further limitations include social class and regional differences within Mexico not being fully captured because of the homogeneity of the SES variable, which limits the generalizability of the findings. Additionally, youth who were not attending school at the time of the study were not able to participate, and they may have different demographic characteristics, levels of suicidal thinking, ideological beliefs, and sexual behaviors patterns. That same line of thinking leads us to a possible limitation with regards to the sample population. Since the study is taking place in a high migratory community, it is possible that many students who would have qualified as participants in this study have already migrated. Due of this possibility, there may be a structural bias among study participants impacting the mental health scores and results in the study.

In order to address the limitation of directionality, I will be conducting thorough literature reviews in order to ensure that my research is theory-driven. Instead of guessing which variables to include and hypothesizing directionality based on ‘common-sense,’ the models have been derived from, and will add to, years of previous research. Furthermore, in order to make certain the statistical models are accurate, regression diagnostics as detailed by Fox (1991) will be

checked for (e.g. multi-collinearity, outliers, non-normally distributed errors).

Lastly, as concerns, questions, and problems arise, I will continue to collaborate and work with those who were involved in the design and collection of the data.

Protecting Human Subjects

With regards to issues surrounding human subject research, participant responses were received as a de-identified database for secondary analyses. Because of this, many of the human subjects concerns that apply to original data collection research will not apply to this project. For example, no participant names are listed on the questionnaires; instead, each survey was assigned a unique code which was recorded in the computer during data entry. Another safety precaution that has been taken is that the questionnaires are kept in a locked room which can only be entered through a small office within a research center that is also kept locked. If any individual at the research center seeks access to the data, they must first complete an NIH online class about protecting human subjects and be approved by the university's internal review board. Lastly, the electronic version of the dataset is not publically available, and is only provided to those who have passed the aforementioned requirements.

Chapter 2

Paper 1

Suicidal Ideation and Migration Aspirations among Youth in Central Mexico

Steven Hoffman, PhD

Abstract

The relationship between suicidal ideation and migration aspirations was studied among a group of Mexican adolescents living in Central Mexico. In 2007, adolescents ages 14-17 attending a video high school program completed questionnaires at school. Regression analysis showed that suicidal ideation predicted migration aspirations among both boys and girls, while other factors differentially influenced the adolescents by gender. Results are discussed in light of the healthy migrant theory. Implications for mental health professionals and migration communities in the US and Mexico are discussed.

Introduction

Research has identified mobility, and more specifically migration, as a risk factor for suicidal ideation (Hovey, 2000; Ponizovsky, Ritsner & Modai, 1999; Potter et al., 2001; Wadsworth & Kubrin, 2007). Similar studies have also found that suicidal thinking is associated with post-migration factors such as acculturation (e.g., Cho, & Haslam, 2010; Fortuna et al., 2007). However, a common shortcoming among these studies is that they either collected their data after the participants had migrated, or they focused solely on general suicide rates among immigrants living in their new countries. In contrast to current explanations surrounding the reason for high rates of suicidal ideation among immigrants is the thought that factors *preceding* migration may be the cause of suicidal ideation. This idea was prompted by a study from Helliwell (2007), but research addressing this thought has been, as of yet, unavailable. Indeed, if a crisis situation, mental illness, or other circumstance in one's host country were the root of suicidal thinking among immigrants, interventions provided in the receiving country are coming too late. The provision of mental health and support services would need to come earlier - within the communities from which the immigrants are leaving. Therefore, in order to bridge this gap in the research literature, the purpose of this study is to examine the relationship between suicidal ideation and migration aspirations among youth living in a high migratory community of Central Mexico.

Migration

Migration, especially Mexican migration to the US, has been studied for years in an attempt to understand the motivating factors behind the decision to leave one's country of origin. Some of the reasons behind the decision to migrate are as follows: 1) Large-scale violence (Martin & Widgren, 2002); 2) the prospect for economic advancement (Alba, Massey, and Rumbaut, 1999); 3) family reunification (Durand, Nolan, & Massey, 2003); 4) domestic violence (Klevens, 2007); and 5) ease of opportunity due to migration networks (Alba, Massey, & Rumbaut, 1999). These migration networks between Mexico and the US are well supported, and the informal networks among Mexican citizens have been observed to be some of the strongest (Menjivar, 1995). Massey et al. (1993) define these social migration networks as "sets of interpersonal ties that connect migrants, former migrants, and nonmigrants in origin and destination areas through ties of kinship, friendship, and shared community origin" (p. 447). Massey and his colleagues also point out that each migrant helps reduce both the costs and risks of future migration, thus increasing the size and sustainability of the network.

Guanajuato, the site of this study, has a long history of migration and has consistently been one of the highest sending states in all Mexico (Massey, Durand, & Malone, 2002). Because of this well rooted tradition, community expectations of youth are intertwined with a lifestyle of migration (Massey, Durand, & Malone, 2002). In communities such as Guanajuato, as many as 40% of youth report an interest in working in the US, with 35% reporting an interest in living there (Kandel & Massey, 2002). Due to the strong migratory networks,

historically high rates of migration, and the high levels of migration interest among youth, Guanajuato is a favorable location in which to study migration.

Suicide

Throughout the world, suicide is a leading cause of death (Legleye, Beck, Peretti-Watel, Chau, & Firdion, 2009). In addition to the loss of life, there are psychological, emotional, and familial problems caused by suicide that can produce enduring difficulties for those left behind. Furthermore, on a macro level, the impact of suicide on a country's economy can be staggering, as evidenced by estimates that suicide in the US leads to over \$111 billion lost each year (Miller, Covington, & Jensen, 1999). Due to this devastating impact on individuals, families, communities, and nations, governments throughout the world have developed national strategies to better understand and fight against this widespread problem (e.g., US Department of Health and Human Services, 2001).

While many nations grapple with the challenges of high suicide mortality, Mexico has enjoyed a comparatively low suicide rate of 3.72/100,000 (Puentes-Rosas, López-Nieto, & Martínez-Monroy, 2004). In fact, in a study that compared suicide rates of 50 countries throughout the world, the suicide rate in Mexico ranked as the 4th lowest (Helliwell, 2007). International comparisons of suicide rates may lead to the belief that suicide in Mexico is not a pressing problem; however, a closer investigation into the country's historical suicide rates shows worrisome morbidity trends. Between 1970 and 1994, the suicide rate in Mexico rose from 1.13/100,000 to 2.89/100,000 (Santos-Preciado et al., 2003). Then, in 1994, the rate increased an unprecedented 156% (Santos-Preciado et al., 2003).

More recently, when compared to 28 other countries between 1990 and 2000, Mexico's suicide rate of increase was one of the highest (Borges, Benjet, Medina-Mora, Orozco, & Nock, 2008). Between 1990 and 2001, the suicide rate for youths ages 11-19 increased from 0.8/100,000 - 2.27/100,000 for girls and 2.6/100,000 – 4.5/100,000 for boys (Puentes-Rosas et al., 2004). Moreover, in 2003 the adolescent population accounted for 17% of all suicides in Mexico (Borges et al., 2008).

One state in Mexico that deserves particular attention when looking at suicide statistics is Guanajuato. Between 2000 and 2001, the suicide rate in Guanajuato increased by 6.7% (Chiapas, 2008). The same study reported the suicide rate for males to be 5.09/100,000, and for females 1.31/100,000. While these suicide statistics for men and women of all age categories are fairly consistent with those of other states in Mexico, the surprising numbers come from the youth in Guanajuato. Between 1997 and 2001, 65% of suicides in Guanajuato were committed by adolescents (Chiapas, 2008). When compared to the percentage of all suicides committed by youth nationwide (17%), the numbers in Guanajuato are stunning (Borges et al., 2008). Unfortunately, studies seeking to understand and eliminate this concern have been, as of yet, unavailable.

Theory

Two theoretical approaches are being used to inform this study. Bronfenbrenner's ecological system's theory (1986) informs this research because of its emphasis on looking at a phenomenon from multiple contexts (micro, mezzo, macro). This study looks at how unique macro-level factors (e.g. social

norms and migration expectations in Guanajuato), mezzo-level factors (e.g. parent-child relationships), and micro-level factors (e.g. suicidal thoughts) work together to influence the relationship between suicidal ideation and migration aspirations among youth in Guanajuato. Bogenschneider's risk/protection approach to research (1996) will also be used to help guide this research. By identifying whether suicidal ideation is connected to migration aspirations (i.e., is suicidal ideation a risk factor?), the connection between mental health and migration will be clarified. Researchers have embraced this approach as a primary method of categorizing the various factors that influence a specific phenomenon (e.g., Gonzalez-Forteza et al., 1998; Borges et al., 2008; Borges et al., 2009). In addition, because it is easily understood not only by researchers but also by non-academic professionals, this approach is used as a method to gain support for community action and secure funding from private or government agencies (e.g., US Department of Health and Human Services, 2001; Leitner, Barr, & Hobby, 2008). Furthermore, as Bogenschneider highlighted in her writings, this approach to research helps policy-makers avoid creating policies based on their own common sense by facilitating the gathering and interpretation of scholarly findings (Bogenschneider, 1996).

The Present Study

Due to its aforementioned high percentage of suicides among youth, as well as its long history of migration, communities in Guanajuato need information looking at how suicidal ideation and migration aspirations are connected. In light of the healthy migrant theory, which asserts that those who migrate are 'healthier'

(Shai & Rosenwaike, 1987; Sorlie, Backlund, Johnson, & Rogot, 1993), the hypothesis for this study is that participants with lower levels of suicidal ideation will have stronger migration aspirations. This hypothesis would coincide with the current thinking that post-migration factors are the cause of suicidal ideation among immigrants. However, if individuals with higher levels of suicidal ideation also have strong migration aspirations, perhaps the current focus looking at the impact of post-migration factors on mental health needs to be re-examined.

Methods

This study is a secondary data analysis, and was approved by the University's Internal Review Board. The original data were collected in 2007 from students enrolled in an alternative high school program located in Central Mexico. At the time of data collection, there were 252 school centers in 38 municipalities with more than 25,000 enrolled students. Eight centers were randomly selected from 137 centers located in 20 municipalities within a 100 km radius of León, Guanajuato. Under the direction of the university research team, surveys were administered by the teachers in each school center. Of the 702 students who participated in the study, 60% were female and 40% were male. Participants' ages ranged from 14 to 24 years, although 90% were between 14 and 18 years old, the traditional age range for upper secondary education. The high school program was specifically designed for rural and suburban Mexican communities. The measures in the questionnaire were tailored for the Mexican adolescent population. Straightforward questions and uncomplicated response categories were used to ensure understanding on the part of the participants.

These relatively simple response formats have been recommended for – and shown to work well with – migrant Spanish-speaking populations from Mexico (Knight et al., 2009).

The final analytic sample consisted of 507 participants. Those who were not single and those who were over the age of 17 were not included in the final sample. The decision to exclude participants who were not single was made to ensure that the information gathered regarding migration aspirations was based more on individual hopes and desires rather than a reflection of family circumstances, such as having to leave a spouse or children at home. Those 18 and older were excluded because they are likely to have different responsibilities and opportunities influencing the decisions they make, thus producing an experience substantially different than those less than 18 years of age.

Variables

The dependent variable, migration aspirations, was created by combining three questions: 1) Would you like to live in the United States some day? 2) Would you like to work in the United States some day?; and 3) I am thinking about migrating to the United States some day. Responses to the first two questions range from 0=Not at all, to 3=Yes, a lot. The third question's responses range from 0=Definitely not, to 3=Definitely. Therefore, a score of 0 on the scale would indicate no migration aspirations, and a score of 3 would indicate very high migration aspirations. This scale was included as part of the pilot-test, and the questions “would you like to live in the US some day,” and “would you like to work in the US some day” have both been asked in previous studies among

Mexican populations (Kandel & Massey, 2002). When scaled together, the measure was found to have good internal reliability ($\alpha=.788$).

The predicting variable of interest is suicidal ideation. This measure asks, “During the past week, how frequently did you: 1) Feel that you could not go on, 2) have thoughts about death, 3) feel that your family would be better off without you, 4) think about killing yourself.” There were 4 response categories: Not once, 1-2 days, 3-4 days, 5-7 days. When scaled together, the internal reliability was found to yield a Cronbach’s alpha of .777. This same scale has been used in previous studies conducted in Mexico (González-Forteza et al., 1998).

Other variables included in this study were gender, age, socioeconomic status (SES), parent-child relationship, whether or not the respondent has ever been to the US, whether or not the respondent’s relatives have ever been to the US, and place of birth. Gender was included in the model because research has shown that boys and girls have different social norms and receive different messages about migration from their parents and the community (Kandel & Massey, 2002). Furthermore, there are longstanding and obvious gender differences when addressing issues of opportunity in Mexico (Cortez, 2001), although there is some research showing that this is changing due to globalization (Kulis et al., 2008). Age, as previously mentioned, was included because thoughts and plans regarding migration are substantially different between a 14 year old respondent who just started high school and senior in high school. SES is almost always included in studies looking at Mexican migration as it has consistently been found to be a significant predictor of migration aspirations (Alba, Massey, &

Rumbaut, 1999; Martin & Widgren, 2002). The SES measure in this study was a scale created from 5 question: “In your home, is there enough money to: 1) Buy food, 2) buy gasoline for your car or truck, 3) pay for basic services (light, water, etc), 4) buy clothing you need, 5) do fun things (take vacations, go to the movies, go out).” The responses categories were 0=Never, 1=Sometimes, 2=Almost always, and 3=Always. The internal reliability of this scale was found to be well within the acceptable range ($\alpha=.854$).

A measure of parent/child relationship was included in the models because the quality of this relationship may influence a youth’s desire or thoughts about leaving home (e.g. someone with a bad relationship with his/her parents may be thinking more about migration). This measure was created from two questions: “How would you describe your relationship with your mother,” and “how would you describe your relationship with your father.” Responses ranged from 0=Bad to 4=Excellent. The mean of both responses was calculated for each child; or, if they only had one parent, the score from the one parent was used. The measure addressing place of birth was included because Guanajuato is such a unique state in Mexico. Adolescents who grew up in Guanajuato and were exposed to the lifestyle of international migration will likely have different opinions and feelings about migration than their peers who grew up in communities where migration was less important. This variable asked: "Where were you born?" Response options were dichotomized into two categories: 0) Born in Guanajuato, and 1) Not born in Guanajuato. The variable was made dichotomous so that the response categories were 0=Not born in this municipality, and 1=Born in this municipality.

Lastly, two questions asking whether or not the respondent or a family member had been to the US were included in the model. Having been to the US previously, or knowing a family member who had, would likely influence whether or not the student has migration aspirations – especially in a community like Guanajuato with a long history of circular migration (Massey, Durand, & Malone, 2002).

Analysis Strategy

First, simple descriptive statistics and bi-variate analyses were run using PASW 18 to identify correlations between measures. Then, STATA 11 was used to run the linear regression models in order to control for nesting effect based on school location. Due to the aforementioned expectation differences placed upon males and females in high migratory communities such as Guanajuato, the first model ran included only female participants, followed by the second model which was composed of only male respondents. After the gendered models were run, the last model was run including all participants. In each of the 3 models was entered the primary variable of interest (recent suicidal thinking) and all the covariates. Due to unique differences identified between the gendered models, additional statistical tests were used to see if gender moderated the relationship between suicidal ideation and migration aspirations.

Results

Table 1 shows descriptive statistics for all variables. The average participant age was approximately 16.04 years ($SD=0.78$), and 65% of the sample was female. While only 7% of students reported ever having been to the US

($\bar{x}=0.07$, $SD=0.25$), the average participant had more than 3 relatives who had ever been to the US ($\bar{x}=3.42$, $SD=1.79$). Over 95% of the participants were born in Guanajuato.

Table 2 shows the OLS regression results predicting migration aspirations. The primary variable of interest, suicidal ideation, was a statistically significant predictor of higher migration aspirations among girls ($b=0.16$, $p<0.05$), for the entire sample ($b=0.18$, $p<0.01$), and was moderately significant for boys ($b=0.28$, $p<0.10$). It should be noted that the p-value for the male only model was very close to statistical significance ($p=.056$), and is possibly a reflection of low power due to the small number of male participants.

Gender was a statistically significant predictor of migration aspirations when included in the 3rd model ($b=0.40$, $p<0.001$), showing that males reported higher migration aspirations than females; however, the interaction models testing to see if gender moderated the relationship between suicidal ideation and migration aspirations were not significant (interaction models not shown). Older females reported higher levels of migration aspirations than younger females ($b=0.12$, $p<0.05$), but age was not a significant factor in either the male only or full sample models. Higher SES was only a moderately significant predictor of migration aspirations among the female sub-sample ($b=0.15$, $p<0.10$), and was not significant in either of the other models. Likewise, in the female only sample, girls reporting lower parent-child relationship scores were more likely to have migration aspirations ($b= -0.14$, $p<0.05$), while this variable was not significant in the other models.

While having ever been to the US was only a moderately significant predictor of migration aspirations in the all female model ($b=0.23, p<0.10$), having more relatives who had been to the US was a very strong predictor of migration aspirations in all three models (Model 1, $b=0.14, p<0.001$; Model 2, $b=0.12, p<0.001$; Model 3, $b=0.13, p<0.001$). Finally, being born in Guanajuato was a statistically significant predictor of increased migration aspirations in the final model ($b= -0.43, p<0.05$). The R^2 value for the female only sample was 0.14, 0.12 for the male only sample, and 0.15 for the combined sample.

Limitations

As this is a secondary data analysis, not all the desired variables were available.. One such variable is previous suicide attempts. The variable measuring suicidal ideation only asked about feelings and thoughts during the previous week. If a variable asking about previous suicide attempt were available, a clearer picture of the association between suicide and migration aspirations could be seen. Along those same lines, a variable looking at how much time the individual planned to stay in the US (if they had migration aspirations) would help tease out those who were solely wanting to earn a bit of money or enjoy a short vacation from those who desired to permanently leave and stay in the US.

Since the participants in this sample are unique, caution should be used when interpreting the results. Participants in this study come from areas with long histories of circular migration to the US, and young men who do not migrate are actually looked down upon by members of the community (Kandel & Massey, 2002). Therefore, recent suicidal ideation may simply be a reflection of their

depleted status in the community, and not necessarily a factor driving their migration aspirations. Future research on this topic should focus on clarifying the connection between suicidal ideation, the community, and migration.

As the dataset was not part of a longitudinal study, the migration aspirations variable was used in place of actual migration. While it can be argued that aspirations to migrate always precede the actual act of migration, there is no way of knowing if the participants in this study will eventually migrate. It is feasible that adolescents struggling with suicidal thinking have desires to migrate, but only those with better physical and mental health are the ones that eventually make it across. Furthermore, no cause and effect relationships are able to be made between the independent and dependent variables in the models because of the cross-sectional nature of the study. Lastly, the migration aspirations scale has not been used in previous studies, and while its psychometric properties were adequate, the use of this scale has not been validated in previous research. In light of these limitations this study makes a needed contribution to understanding the mental health of potential migrants still living in Mexico.

Discussion

The purpose of this study was to identify the connection between suicidal ideation and migration aspirations among youth in central Mexico. Building off the idea prompted by Helliwell (2007) that the same factors that lead one to migrate may also be associated with suicidal ideation, this study was undertaken to test if suicidal ideation was not just a result of migration, but perhaps also a

predictor. In addition, these findings respond to the call for more information about the reasons behind adolescent migration (Castellanos, 2007).

The results of our models did not support the author's hypothesis. Instead, they indicate that higher levels of recent suicidal ideation are actually predictive of migration aspirations for both boys and girls. Even though the vast majority of youth who participated in this study have never been to the US, it would seem that this findings somewhat contradicts previous research that has led to the healthy migrant theory (e.g., Shai & Rosenwaike, 1987; Sorlie, Backlund, Johnson, & Rogot, 1993) and research looking at the overall mental health of first generation immigrants (e.g., Hovey, 2000; Ponizovsky, Ritsner & Modai, 1999; Potter et al., 2001; Wadsworth & Kubrin, 2007). If Mexican adolescents who migrate have a history of poor mental health, then perhaps factors such as acculturation stress are not *causing* suicidal ideation, but rather producing a resurfacing or worsening of previous mental health issues.

Why suicidal ideation would predict migration aspirations was not an initial objective for this study, but it is worth considering in light of the results. Perhaps in the same manner in which large-scale violence (Martin & Widgren, 2002) and domestic violence (Klevens, 2007) are associated with migration, perhaps suicidal ideation is a burden that instigates the desire to leave one's current situation. While the onset of suicidal ideation may come from a variety of factors (US Department of Health and Human Services, 2001), the desire for a new life in the United States may be a common hope resulting from this problem. Migration as a potential solution to mental health needs may be partially due to

the strong migration networks of the community and the migration-specific social capital of the adolescents (Massey & Espinosa, 1997), in combination with unavailability of mental health services in Mexico or taboo associated with mental health needs. An alternative possibility as to why suicidal ideation is predictive of migration aspirations is that this sample is a biased selection of adolescents without the means to migrate. It has been shown that living in high migratory communities and knowing individuals that have traveled to the US is positively associated to migration, and negatively associated to educational attainment (Kandel & Kao, 2001). Therefore, since this sample was taken from adolescents attending school, it may be biased towards those who do not have the means to complete international migration, while those who are able to migrate have already done so, or are no longer attending school since the US job market does not acknowledge higher education acquired in Mexico. This may also explain the high percentage of females in this sample, as many males may have already dropped out of school or migrated. However, as this study did not investigate the reasons why suicidal ideation predicts migration aspirations, future research is needed to more fully understand how these variables are associated.

The other variables included in the models also offer interesting contributions to this study in light of the ecological systems theory. Predictors of increased migration aspirations for the girls in the sample included being older and having previous been to the US (micro level factors), as well as coming from a family with more financial resources and reporting a weak relationship with their parents (mezzo level factors). For boys, however, none of the

aforementioned variables were statistically significant predictors of migration aspirations. Perhaps these differing results between boys and girls are due to the unique culture and migration history within Guanajuato. While boys are strongly encouraged to migrate (Kandel & Massey, 2002), girls do not feel the same pressure to leave home. Therefore, instead of stemming from macro factors such as community expectations, migration aspirations among girls may be initiated by micro and mezzo factors such as age, SES, parent-child relationship, and previous time in the US. Finally, with regards to the final control variable, boys and girls who were from Guanajuato (macro level factor) reported higher migration aspirations than those who were raised elsewhere in Mexico. This was expected due to the migration culture that is present in Guanajuato (Massey, Durand, & Malone, 2002).

Implications for Practice, Policy and Research

The findings from this study can be beneficial to both the sending communities of Mexico as well as the receiving communities in the US. While further investigation into the mental health of Mexicans before they migrate is needed, these results indicate that suicidal ideation may be one of the factors that influence their desire to leave Mexico. For receiving communities in the US, this information suggests that health professionals and organizations that focus on immigrant Mexican populations should specifically look at mental health history (e.g., suicidal ideation) as part of their initial patient screenings. This information also has potential practice implications in Guanajuato. By understanding the connection between suicidal ideation and migration aspirations, community

organizers, social workers, school officials, and other mental health professionals can focus community resources on creating culturally specific suicide prevention efforts that address the unique migration culture present in the communities.

For organizations and researchers in the US, in addition to the attention that is currently being put on the stresses of acculturation, perhaps further consideration of the migrant's mental health history is warranted. Teasing out migrants who report a history of poor mental health from their counterparts may provide valuable insights into the speed and level at which a migrant acculturates. Also, while this study highlights some factors that influence migration aspirations differently by gender, suicidal ideation was a significant predictor for both males and females. Researchers should focus on identifying common factors that lead to migration aspirations among all adolescents, and by doing so can help those who serve this population focus their resources into areas of common need. At the same time, understanding the different reasons females migrate as opposed to males can lead to more effective gender specific approaches. Also building from the findings of this study, additional research into the mental health of individuals living in high migratory communities could provide valuable information from which to assemble a foundation of knowledge about the association between suicidal ideation and migration.

Future research questionnaires should include variables asking about previous suicide attempts and other mental health history issues such as anxiety. This information will help policy makers gain further insight into the scope of the mental health problems that are motivating aspirations to migrate among

adolescents. Also, upcoming studies should also seek to understand the mental health differences between potential migrants who are single as compared to those who have a spouse and/or children, while also including those who are above the age of 18. As this study focused solely on single youth, the findings do not address the unique factors motivating migration among adults or individuals with families. If future studies are able to secure the necessary resources to collect longitudinal data, possible time ordering complications will be eliminated and causal inferences could be drawn. This could be done by working with US agencies that serve recent migrants. By collecting historical mental health information from them and then tracking their mental health status over time (e.g., 5 years), a better picture of the relationship between migration and mental health will be obtained. This information could also be beneficial to understanding mental health and migration in other countries throughout the world, and similar studies in high migrant receiving countries would be beneficial to understanding if the findings in this study are found only among this unique sub-population in Mexico, or if they are indicative of broader human movement patterns.

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Table 1a Descriptive Statistics for Paper 1

Variable	N	Range	Mean	Standard Deviation
Intentions to migrate	486	0-3	1.60	0.86
Suicidal thoughts during previous week	493	0-3	0.42	0.58
Gender (Fem=0 Mal=1)	500	0-1	0.35	0.48
Age	507	14-17	16.04	0.78
SES	506	0-3	1.90	0.57
Parent Child Relationship	495	0-4	2.93	0.90
Ever been to the U.S.	466	0-1	0.07	0.25
# of relatives ever been to the U.S.	500	0-9	3.42	1.79
Born in Guanajuato	504	0-1	0.04	0.2

Table 1b OLS Regression Results Predicting Migration Intentions

Independent Variables	Females	Males	All
Suicidal thoughts during previous week	0.16*	0.28 [†]	0.18**
Gender (Fem=0 Mal=1)			0.40***
Age	0.12*	-0.02	0.07
SES	0.15 [†]	0.04	0.10
Parent Child Relationship	-0.14*	0.05	-0.08
Ever been to the U.S.	0.23 [†]	0.12	0.20
# of relatives ever been to the U.S.	0.14***	0.12***	0.13***
Born in Guanajuato	0.37	0.49	0.43*
R^2	0.14	0.12	0.15

[†]p<.10; *p<.05; **p<.01; ***p<.001

Chapter 3

Paper 2

Suicidal Ideation and Sexual Relations among Youth in Central Mexico

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Abstract

This article reports on the findings of a study on the relationship between religiosity and suicidal ideation among a group of Mexican adolescents living in Central Mexico. In 2007, over 700 students attending a video high school program completed questionnaires at school. Logistic regression analysis showed that external religiosity exerted a protective influence against suicidal ideation, while internal religiosity showed no protective power. Results are discussed in light of previous research conducted in the tradition of Durkheim, Stack, Pescosolido, and other religiosity theorists.

Introduction

The study of suicide and religion finds its modern beginning in the work of Emile Durkheim (Durkheim, 1897). Over the past century, many suicide theorists have critiqued and broadened his groundbreaking ideas regarding the protective power of religious integration; however, despite the countless opinions regarding his work, numerous contemporary researchers continue to use Durkheim's thoughts and themes in their own work, with some studies even supporting his original findings (Colucci and Martin, 2008; Pescosolido, 1990; Pescosolido, and Georgianna, 1989; Stack, 1983; Stark, Doyle, & Rushing, 1983; Thomas, 2000). Despite its rich history, the study of suicide and religion has failed to produce conclusive and widely accepted findings explaining how religion serves as a protective factor against suicide, and new ways of measuring both religiosity and suicide have added increased complexity to this debate (Colucci and Martin, 2008; Ellison, et al., 2007; Parsia, Marsiglia & Kulis, 2010; Nasim et al., 2006). These findings warrant further research, especially in countries outside of Europe and the United States where suicide research is limited or non-existent. The purpose of this paper, therefore, is to seek additional understanding about the association between religion and suicide by studying a group of adolescents living in central Mexico.

Suicide and Religion

A detailed review of the theoretical underpinnings guiding the religion and suicide research over the past century is beyond the scope of this study. The following is a summary of the main ideas that have shaped our understanding of

the phenomenon. The first of these theories is the integration theory proposed by Durkheim (1897), which has been the cornerstone of modern suicide research since the time of its publication. Durkheim reasoned that the Catholic Church's strong sanctions against suicide - as well as its integrated traditional structure - served as deterrents against suicide amongst its members (Colucci and Martin, 2008). In comparison, the religious freedom of thought and lack of integration amongst members of Protestant denominations was his explanation for their higher suicide rates (Durkheim, 1897). In short, Durkheim asserted that church affiliation was the key to understanding the protective power of religion against suicide.

Perhaps the straightforwardness of Durkheim's theory is the reason for both its longevity and its susceptibility to critique. Some have concluded that Durkheim's work was flawed by his poor understanding of "elementary facts about religion in Europe at the time he wrote" (Stark, Doyle, & Rushing, 1983, p. 120). Others assert that his original findings could no longer hold true in today's complex society (Pescosolido, 1990; Colucci & Martin, 2008). One of the strongest critiques was set forth by Stack (1983), in which he questioned various aspects of Durkheim's original studies. Stack asserted that religious affiliation was inappropriately used, and that the true driving force behind the difference in suicide rates was a person's level of religious commitment. He also criticized Durkheim's work because of the simplicity of his bi-variate models, and suggested that multivariate models were needed in order to see the real relationship between religion and suicide. Using these critiques as the foundation

for his studies, Stack developed the religious commitment theory. Upon obtaining data from 25 countries, he found that, no matter the person's religious affiliation, life-preserving religious beliefs, values, and practices based in any organized religion were associated with lower suicide rates. Upon publication his argument gained considerable strength, and religious research motivated by this theory is still being conducted today (Fiala, Bjorck, & Gorsuch, 2002; Nasim et al., 2006); however, the religious commitment theory has its critics.

In the original article, Stack himself noted that the findings only held true for women, and not for men (Stack, 1983). He attributed this to the idea that women were, in general, more religious than men. A more recent critique of this theory comes from Colucci and Martin (2008), in which they highlight that little research has been done among non-religious populations who hold personal spiritual beliefs. They assert that spirituality in general may be protective, and that a person need not have their beliefs grounded in a specific religion's values or practices. They claim that organized religion may not have any protective power, and that any set of life-preserving beliefs and convictions is all that is needed.

After Stark's theory was set forth, some researchers started to reconsider the importance of Durkheim's original work. For example Pescosolido and Georgianna (1989) closely replicate Durkheim's study and examined religious affiliation and suicide rates using data collected in the 1970s. Their findings supported Durkheim's theory by showing that membership in the Roman Catholic Church exerted a protective effect against suicide, while membership in Protestant Christian denominations increased the risk of committing suicide. Pescosolido

and Georgianna, however, interpreted their results differently from Durkheim. Instead of attributing the lower suicide rates among Catholics to the religious integration of the members, they theorized that there were fewer suicides among Catholics because they had stronger social networks. As explained in her future work on suicide, Pescosolido (1990) said that there was a belonging aspect to religion, and that the network relationships and ties among members of certain religions and religious communities were the foundation for the protective influence of religion against suicide. This new interpretation became the foundation for looking at suicide through the lens of network theory.

New Measures

Despite the various theories and interpretations that have evolved over the years, there continues to be calls for additional research looking at the relationship between suicide and religion (Colucci & Martin, 2008). Perhaps the best approach to gain further understanding of this phenomenon is through the exploration of additional factors. While records of completed suicides have traditionally been used to study the connection between religion and suicide, current research looks at this topic from a broader perspective: Suicidal ideation, suicide attempts, and completed suicides (Leitner, Barr, & Hobby, 2008; US Department of Health and Human Services, 2001). The correlations between suicidal ideation and suicide attempts and completed suicides have consistently proven to be very strong (e.g., Botega et al., 2005; Kessler et al., 2005), and the use of these additional measures (suicidal ideation and previous suicide attempts) has become widely accepted, and

even recommended (Brown, Wyman, Brinales, & Gibbons, 2007; Wyman et al., 2009; Leitner, Barr, & Hobby, 2008).

The measurement of religiosity has also evolved, in part due to the aforementioned suicide and religiosity literature. Two main dimensions of religiosity are now commonly assessed: Internal religiosity (i.e. personal beliefs or convictions) (Gillum, Sullivan, & Bybee, 2006; Nasim et al., 2006), and external religiosity (i.e. attending church meetings or activities) (Fiala, Bjorck, & Gorsuch, 2002; Ellison, et al., 2007). Also included in recent studies are the traditional measures of religious affiliation (Curlin et al., 2008; Parsai, Marsiglia, & Kulis, 2010). By looking at religiosity from a multi-dimensional standpoint, researchers are able to see which aspects of religiosity are most protective. By utilizing new methods for measuring the concepts of religiosity and suicide, additional knowledge can be gathered as we revisit this complex phenomenon.

Religion and Suicide in Mexico

Another way to gather additional insights into the connection between religion and suicide is by looking at the association in new populations. Mexico as a nation has not received attention in previous research focusing on this topic. When considering the relationship between religiosity and suicide in Mexico, it is imperative to understand the powerful influence that the Catholic Church has historically had on the nation's culture. In fact, Hovey (1999) highlights that Catholicism has been ingrained so deeply into Mexican culture that religious ceremonies such as baptisms and first communions are considered social events. It should be noted that these social events would fall under the umbrella of

external religiosity, and attendance at such events is not necessarily a reflection of a person's level of faith, belief in the church's teachings, or adherence to the church's spiritual principles (internal religiosity). Indeed, it has been a lack of strict doctrinal adherence among the membership of Catholic Church that has led to terms categorizing such individuals as the 'supermarket' or 'cafeteria' Catholics – terms that describe individuals who identify as Catholics but do not attend church services or follow the church's teachings (Leach, 2000). However, many people are influenced by the church's teachings and spiritual guidance, and for them the church's stance toward suicide strongly influences their own beliefs about it. In the Catechism of the Catholic Church, suicide is said to not only contradict an individual's duty to love God and love their neighbor, but also goes against moral law (Catechism of the Catholic Church, 2006). Knowing that the Catholic Church has held a firm stance against suicide for many years (Colucci & Martin, 2008), one might assume that, while not everyone adheres to the church's doctrine, a negative cultural perception of suicide may be part of the reason that Mexico continues to have a low rate of suicide (Puentes-Rosas, López-Nieto, & Martínez-Monroy, 2004).

While previous research has not focused specifically on the connection between suicide and religiosity in Mexico, some studies have compared how regions of high and low religiosity differentially influence suicide rates. In a multisite international study, Helliwell (2009) concluded that religion is more protective against suicide in less religious countries, as well as in less religious areas of a single country. As Mexico is considered a very religious country

(University of Michigan News and Information Services, 1997; Wilson, 2008), according to Helliwell (2009) the assumption would be that religiosity would have a weak influence on suicide rates among Mexican citizens. This reasoning somewhat contradicts previous research conducted by Pescosolido (1990). In her study, she found that areas of historical Catholic strength were more protective against suicide than regions of less historical Catholic strength. So would religion have little influence on suicide because Mexico it is a highly religious country (Helliwell, 2009), or would religiosity have a strong protective effect because it is an area of historical Catholic strength (Pescosolido, 1990)? This question, coupled with the ongoing debate surrounding the protective influence of internal versus external religiosity, are supportive of the assertion by Colucci and Martin (2008) that international studies in countries such as Mexico are needed to better understand the true relationship between religion and suicide.

Present Study

The present study aims to increase our understanding of the relationship between suicide and religiosity by studying the phenomenon in a new population (Mexican adolescents), and with the use of new measures (i.e., suicidal ideation, internal religiosity, external religiosity). We hypothesize that, based on a combination of Stack's (1983) and Pescosolido's (1990) findings, high levels of internal religiosity, as well as high levels of external religiosity, will both be associated with lower levels of suicidal ideation.

Method

Data collection

Data for this study were collected in Guanajuato, Mexico from 8 alternative high schools that were randomly selected from a pool of 137 schools. The primary function of these alternative schools is to serve students from low income families who may not have access to a traditional high school due to low income, place of residence, or a combination of the two. Under the direction of the university research team, school psychologists and instructors administered the questionnaire to consenting students who were at school the day of the study. The response rate for the questionnaire was 95%, resulting in 702 participants (60% female) ages 14-24. While some students were over the age of 18, the vast majority (90%) of the participants were within the traditional age range of high school students. Those 18 and over were not included in the final sample so that the results could be interpreted based on traditionally aged high school students. Also, previous research has suggested that religiosity among adolescents living at home with their parents is distinct from those 18 and over (Marsiglia et al., 2005). The Arizona State University Internal Review Board approved the implementation of this secondary data analysis.

Variables

The dependent variable for this study is suicidal ideation. This measure asked, "During the past week, how frequently did you: 1) Feel that you could not go on, 2) have thoughts about death, 3) feel that your family would be better off without you, 4) think about killing yourself." There were 4 response categories: Not once, 1-2 days, 3-4 days, 5-7 days. This scale has been used in previous studies conducted in Mexico (González-Forteza et al., 1998), and when scaled

together, the internal reliability was found to yield a Cronbach's alpha of .77. Due to the large frequency of respondents that reported not experiencing suicidal ideation in the last week, or only briefly experiencing such thoughts (i.e. selecting the 1-2 days response option), the variable was dichotomized so the final variable values were 0=No suicidal ideation during the past week, and 1=Suicidal ideation during the past week.

The primary independent variables for this study are internal and external religiosity. Internal religiosity was measured by asking, "How important is religion to you?" Responses ranged from 0=Not important to 3=Very important. External religiosity was measured by asking, "How often do you attend religious services at your church, mosque, synagogue, or temple?" Responses ranged from 0=Never to 4=Every week. Both these religiosity measures have been used in prior studies (e.g., Amoateng & Bahr, 1986; Taylor, Chatters, Jayakody, & Levin, 1996). Other variables included in the model are as follows: Gender, age, socioeconomic status (SES), parent-child relationship, and living arrangement. Gender (0=Female, 1=Male) will be included in the model because much has been written on the relationship between gender and religion, including how religion differentially influences males and females (e.g. King, 1995; Sullins, 2006). Furthermore, factors such as gender roles are integral in shaping behavior (Moon et al., 1999; Slater et al., 2001), Mexico has been found to have very different societal expectations for and perceptions of men and women (e.g., Gutmann, 1996; Hardin, 2002; Jelin, 2005; Kulis et al., 2003, 2008; Lirio et al., 2007; Marsh & Myers, 1986; Reyes Luna et al., 2004; Ricciardelli & Williams,

1995; Rocha-Sanchez & Diaz-Loving, 2005), and females are much more likely to struggle with suicidal ideation than are males (Zayas, 2000; Zayas et al., 2005). SES was measured by asking the respondents 5 questions, “In your home, is there enough money to: Buy food, buy gasoline for your car or truck, pay for basic services (light, water, etc), buy clothing you need, do fun things (take vacations, go to the movies, go out).” The response categories were 0=Never, 1=Sometimes, 2=Almost always, 3=Always, and the internal reliability of this scale was found to be well within the acceptable range ($\alpha=.854$). Parent-child relationship was created from two questions: “How would you describe your relationship with your mother,” and “how would you describe your relationship with your father.” Responses ranged from 0=Bad to 4=Excellent. The mean of both responses was calculated for each child; or, if they only had one parent, the score from the one parent was used. This measure was included in the analysis because stronger parent-child relationships have been shown to reduce suicidal ideation (US Department of Health and Human Services, 2001). Lastly, living in a single parent household has also been identified as risk-factors for suicidal ideation (US Department of Health and Human Services, 2001; Weitoft, Hjern, Haglund, & Rosen, 2003), and was measured by asking the participants with whom they lived. Those who did not live with either of their parents were coded as 0, those living with one parent were coded as 1, and if they lived with both parents they were coded as 2.

Analysis Strategy

First, data cleaning, variable creation, and the recoding of variables was completed. Next, descriptive statistics, correlations, and bi-variate analyses were run using PASW 17. STATA 11 was then used to run the logistic regression model so as to control for nesting effects based on school location. Lastly, due to the aforementioned differing gender roles and community expectations of males and females, additional models were run to see if gender moderated the relationship between the religiosity measures and suicidal ideation.

Results

Descriptive statistics for each variable are included in Table 1. The average participant age was 16.04 years ($SD=0.78$), and 63% were female. Most students lived in a two-parent household ($\bar{x}=1.82$; $SD=0.44$), and the average participant had between a “good” and a “very good” relationship with their parents ($\bar{x}=2.93$; $SD=0.88$). Looking at the primary study variables, over half the sample reported having suicidal thought during the past week ($\bar{x}=0.54$; $SD=0.50$). The average student reported high levels of internal religiosity ($\bar{x}=2.48$; $SD=0.71$), and attended church somewhere between a few times a month to a few times a year ($\bar{x}=2.43$; $SD=1.30$).

Table 2 shows the results of the logistic regression predicting suicidal ideation. While increased levels of internal religiosity did not predict lower odds of suicidal ideation during the past week, more frequent church attendance (external religiosity) did, predicting a moderately significant decrease of 12% ($CI=0.76-1.02$). As compared to females in the sample, males were 33% less likely to have had suicidal thoughts in the previous week ($CI=0.45-1.02$), which

was also found to be moderately significant. The strongest predictor of decreased suicidal ideation was parent-child relationship (OR=0.68; CI=0.54-0.85; $p \leq .001$). Age, SES, and living arrangement were not found to be statistically significant. The interaction model for gender was not significant (OR=1.03; CI=0.85-1.24 $p > .10$).

Limitations

Due to the nature of the dataset (secondary data) not all the desired variables were available for analysis. Instead of solely focusing on suicidal ideation during the past week, future studies should also look at previous suicide attempts. This will provide results that are more comparable to previous studies.

Also, more recent spirituality research has not only separated religiosity into internal and external categories, but has devised more comprehensive scales that can more accurately assess one's internal and external convictions (e.g., Koenig et al., 2005), and using such scales in the future could further our understanding of the potential protective power of religiosity. Indeed, due to the intertwined relationship between the Catholic Church and Mexican society (Hovey, 1999; Leach, 2000), it may be argued that the external religiosity measure in our sample was not actually measuring religiosity, but was instead a sign of community involvement (see Pescosolido, 1990). Therefore, future studies should include strong measures of community/social support to provide additional clarification into the relationship between suicidal ideation and external religiosity in Mexico.

Lastly, the population from which these data were drawn has a higher prevalence of adolescent suicidal ideation (Borges et al., 2008) and a higher percentage of completed suicides among youth (Chiapas, 2008) as compared to the rest of Mexico. Therefore, studies in other Mexican states are needed to ensure the results of this study are replicable in other locations.

Discussion

The aim of this study was to better understand the association between religiosity and suicide with a unique and understudied population and geographical context – a relationship that has been looked at for more than 100 years. Our hypotheses were based on the ideas of Stack (1983) and Pescosolido (1990), and were tested amongst a new population (Mexican adolescents) using new measures (e.g. suicidal ideation) and two religiosity categories (internal and external). The results supported one of our two hypotheses by showing that while internal religiosity (personal convictions and beliefs) was not protective against suicidal ideation, external religiosity (frequency of church attendance) did exert a marginally significant protective influence.

Perhaps the most interesting of these findings was that internal religiosity did not show any protective influence against suicidal ideation despite showing positive protective power in other recent studies (e.g., Fiala, Bjork, & Gorsuch, 2002; Nasim et al., 2006). One explanation for this finding (as previously mentioned) was set forth by Helliwell – that religion is more protective against suicide in less religious countries, as well as in less religious areas of a country (2007). As Mexico is a highly religious country, and with the majority of

participants in this sample reporting high levels of internal religiosity, perhaps the findings of Helliwell's study are applicable to this population. Another explanation for this unique finding is that the current study is looking at recent suicidal ideation as opposed to completed suicides, and is also measuring internal religiosity differently than both Stack (1983) and Helliwell (2007). It may be that a focus on previous suicide attempts or lifetime suicidal ideation would have yielded findings closer aligned to previous research. Lastly, recent research on decision making may provide additional insight as to why internal religiosity did not protect against suicidal ideation. Decisions people make are not always a perfect reflection of their beliefs and values (Black, 1997; Fernando & Jackson, 2006). Therefore, it may be that an individual's spiritual beliefs do not always contribute to their decision-making process. For example, one may believe that they will not go to heaven if they commit suicide, but going to heaven may not necessarily be important enough to take into consideration when contemplating suicide. While students in our sample view their religion and its teachings as very important, it may be that the doctrine and stance of the church on important issues does not factor into the decisions they ultimately make. Or perhaps this is a reflection of the aforementioned idea about 'supermarket' Catholics, wherein the students simply do not have the same perspective on suicide as the Catholic Church. On the other hand, perhaps the teachings of the church are an important part of their decision making process, and while they may be struggling with suicidal thoughts, their decision to not act on these thoughts could be representative of their religious convictions.

Even though external religiosity was found to be protective against suicide (as hypothesized), the fact that it was only moderately significant was somewhat surprising. Perhaps the reason for this can be attributed to the age and living arrangements of the participants in this study. The participants were between the ages of 14-17 and still living at home with one or both parents. Some researchers have suggested that measures of external religiosity collected from youth who live at home may provide misleading information, primarily because the decision to attend church could be more of a reflection of their parent's expectations instead of an accurate indication of the participant's personal desires to attend church (Marsiglia et al., 2005). If this was indeed the case for the participants in the present study, then the students who attended church solely to meet their parent's expectations altered our ability to understand the true influence of voluntary external religiosity on suicidal ideation.

Indeed, while the external religiosity results is supportive of Pescosolido's network theory writings (1990), more information is needed (e.g., strong social support measures) to fully test this theory. Furthermore, the belonging aspect of religion that he suggested may not be applicable to adolescents who may have been forced to attend church services against their will. However, as there is no way to know from this study whether or not the youth were forced to attend church services, the results may simply be a reflection of the new variables and measures, or perhaps the unique Mexican population.

The control variables in this study acted mostly as expected. Even though the gender interaction models were not statistically significant, in line with

previous research there was a notable difference between males and females with regards to suicidal thinking (e.g., King, 1995; Sullins, 2006; Zayas, 2000; Zayas et al., 2005). A strong parent-child relationship was protective against suicidal thinking, SES and age showed no effect (both these variables had low variability), and living arrangement was, surprisingly, not protective against suicidal ideation. Perhaps the different cultural interpretations of family between the US and Mexico (see Marsiglia & Kulis, 2009) are why the living arrangement variable did not show a protective influence in this study the same way it has been found to be protective in previous studies (e.g., US Department of Health and Human Services, 2001; Weitoft, Hjern, Haglund, & Rosen, 2003).

Conclusions

This study was undertaken in response to calls for research on religiosity and suicide in countries such as Mexico (Colucci & Martin, 2008). The findings provide valuable information, and have practical applications. Despite the limitations of the study, this research helps support the idea that attending church events is protective against suicidal ideation. Mental health practitioners in Mexico should consider using culturally sensitive approaches to disseminate this information and encourage involvement in church activities when appropriate. By understanding the protective power of external religiosity, religious organizations of all faiths can consider ways to increase their exposure to individuals and families within the community, and can organize activities designed for entire communities instead of focusing solely on church attending members of their faith. In addition, as the parent-child relationship was an important protective

factor against suicidal ideation, perhaps parents should find ways to combine the protective influences of religion and the parent-child relationship. Ideas may include attending church together, attending religious activities together, and serving together in the church. While this study provides valuable information, it should be noted that more studies looking at religiosity and suicide need to be conducted in Mexico to see if the results of this study are replicated in other locations with students who are not attending the unique alternative high school system in Guanajuato from which these data were drawn.

While additional research on religion and suicide is needed in Mexico, as other researchers have pointed out (e.g., Ellison, Burr, & McCall, 1997), future studies should also be conducted among individuals of non-Christian religions. While this idea has not been completely overlooked (e.g., Ghorpade, Lackritz, & Singh, 2008), virtually no projects have been undertaken that specifically look at the influence of religion on suicide rates among non-Christian populations. By replicating this study in other locations within Mexico, and by starting new projects among non-Christian individuals, the connection between religion and suicide will continue to be better understood.

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Table 2a Descriptive Statistics for Paper 2

Variable	N	Mean	Range	Standard Deviation
Suicidal Ideation	543	0.54	0-1	0.50
Internal Religiosity	504	2.48	0-3	0.71
External Religiosity	504	2.43	0-4	1.30
Gender	536	0.37	0-1	0.48
Age	543	16.04	14-17	0.78
SES	541	1.90	0-3	0.57
Parent Child Relationship	531	2.93	0-4	0.88
Living Arrangement	531	1.82	0-2	0.44

Table 2b Logistic Regression Predicting Suicidal Ideation

	OR	95% CI
Internal Religiosity	0.93	0.71 - 1.24
External Religiosity	0.88 [†]	0.76 - 1.02
Gender	0.67 [†]	0.45 - 1.02
Age	1.06	0.83 - 1.34
SES	1.08	0.76 - 1.53
Parent Child Relationship	0.68**	0.54 - 0.85
Living Arrangement	1.02	0.64 - 1.53

[†]p ≤ .10; *p ≤ .05; **p ≤ .01; ***p ≤ .001

Chapter 4

Paper 3

Suicidal Ideation and Sexual Behavior in Central Mexico

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Abstract

While abundant in the US, international research looking at the relationship between sexual behavior and suicidal ideation is scarce. In an effort to advance our international knowledge on the subject, said topic was studied among Mexican adolescents attending an alternative schooling program in Guanajuato, Mexico. Over 700 youth completed questionnaires. Logistic regression models showed that none of the sexual behavior variables were significantly associated with suicidal ideation. Results are discussed in light of the ecological systems theory. Continued research on this topic is needed in Mexico to address the country's rapidly increasing suicide rates.

Introduction

While there has been widespread political debate about the moral and ethical issues surrounding various aspects of sexual behavior (e.g., sexual education in public schools), much of the research on this topic is inconclusive. For example, a recent study found that sexual activity is a risk factor for suicidal ideation (Legleye et al., 2009); however, since the connection between sexual behavior and suicide has been largely overlooked in the research literature (especially within the international community), the authors emphasized that the relationship between sexual behavior and suicide is still not fully understood. This same sentiment is reflected in other writings focusing on related risk behaviors and their association with suicide (Hallfors et al., 2004). Despite a fair number of works in the US that have been put forth on the possible connection between sexual activity and suicide, studies in countries such as Mexico are extremely limited. The purpose of this study is to look at how sexual behavior among youth living in Central Mexico is related to suicidal ideation.

Suicide

Suicide is, without a doubt, a leading cause of death throughout the world (Legleye et al., 2009). From the individual's emotional struggle to the devastating economical burden, the consequences of suicide influence us at all levels (Cere, Jordan, & Duberstein, 2008; Miller, Covington, & Jensen, 1999). As a consequence of seeing the personal, familial, community, and economic devastation caused by suicide, governments throughout the world are studying this phenomenon and developing national strategies to combat against this

growing problem (e.g., US Department of Health and Human Services, 2001; Leitner, Barr, & Hobby, 2008). Such findings call for additional efforts to be taken in order to combat suicide, and to accomplish that objective, more research on the topic is needed.

Compared to many other countries throughout the world, Mexico has enjoyed a comparatively low suicide rate of 3.72/100,000 (Puentes-Rosas, López-Nieto, & Martínez-Monroy, 2004). In fact, one study that compared more than 45 countries found that Mexico's suicide rate was the 4th lowest, while other countries such as Lithuania had suicide rates as high as 38/100,000 (Helliwell, 2007). Despite the comparatively low suicide rates, in-depth analyses of Mexico's suicide numbers show disheartening trends. For example, between 1970 and 1994, the suicide rate in Mexico rose from 1.13/100,000 to 2.89/100,000 (Santos-Preciado et al., 2003). Then, in 1994, the rate went up 156% (Santos-Preciado et al., 2003). Despite many comparisons portraying Mexico as a country without a serious suicide problem, a recent comparison with over 25 countries showed that Mexico's suicide rate increase between 1990 and 2000 was one of the fastest (Borges, Benjet, Medina-Mora, Orozco, & Nock, 2008). In fact, between 1990 and 2001, the suicide rate for youths ages 11-19 increased from 0.8/100,000 to 2.27/100,000 for girls and 2.6/100,000 to 4.5/100,000 for boys (Puentes-Rosas et al., 2004). Furthermore, in 2003 the adolescent population accounted for 17% of all suicides in Mexico (Borges et al., 2008).

Particular notice should be paid to the state of Guanajuato, Mexico, as it has shown one of the most concerning adolescent suicide trends. Between 1997

and 2001, 65% of all suicides in Guanajuato were committed by adolescents (Chiapas, 2008), compared to 15% nationwide (Borges et al., 2008), and that number is rising. Between 2000 and 2001, male and female youth suicide rate increases in Guanajuato were growing at the same rate as the rest of the country (Chiapas, 2008). Therefore, not only is the overall percentage of youth suicides in Guanajuato a great deal higher than the rest of the country, the disparity is showing no signs of closing. Unfortunately, studies seeking to understand and eliminate this statewide concern have been, as of yet, unavailable.

Mexico, Sexual Behavior, and Suicide

Various sexual behaviors are linked to suicidal ideation, suicidal behaviors, and completed suicides. Some of these include child sexual abuse (Goldner, Grande, & Taylor, 2009), homosexuality (Remafedi et al., 1998; Cash & Bridge, 2009), pregnancy (Kirby, 2002), ever having had sex (King, Schwab-Stone, & Flisher, 2001), and substance use combined with sexual activity (Hallfors et al., 2004; Burge, Felts, Chenier, & Parrillo, 2009). While scarce, research in Mexico is starting to focus on the relationship between sexual behaviors and suicide as well, with some recent studies having included child sexual abuse and sexual trauma variables in their mental health and suicide research (e.g., Borges et al., 2008; Both et al., 2010). While the findings from these studies are similar to those found previously in the US, the connection between sexual behaviors and suicide in Mexico is still far from being well understood.

Studying sexual behavior and suicide in Mexico is unique because of the cultural and societal makeup of the country. The Catholic Church, for example, not only influences people's religious thinking, but is so intertwined with Mexican society that religious activities such as baptism and communion are considered social events (Hovey, 1999). Perhaps because of this, adherence to church guidelines regarding behaviors such as sexual conduct and suicide (Catechism of the Catholic Church, 2006) can be seen as more than just a religious suggestion, but rather as a cultural expectation. In fact, in 2006 only 7% of single Mexican females reported having had their first sexual relations between the ages of 15 and 19 (Juárez, Palma, Singh, & Bankole, 2010) compared to 57% of youth in the US (Carver, Joyner, & Udry, 2004). It has been suggested that the cultural expectations that contribute to such low numbers of sexually active youth could be part of the reason behind Mexico's comparatively low suicide rates (Puentes-Rosas, López-Nieto, & Martínez-Monroy, 2004).

One reason there might not be much Mexican data focusing on suicide and sexual behavior among youth can be partially attributed to Mexico's relatively low rates of suicide and sexually active youth; thus, the relationship between these variables has not drawn much attention. However, in light of the aforementioned spike in the suicide rates (Santos-Preciado et al., 2003), it would seem that it is now necessary to address the relationship. By looking at this connection among youth residing in Guanajuato, Mexico, researchers can address this growing problem in a state with one of the highest percentages of youth suicides (Chiapas, 2008).

Theory

The ecological systems theory is often used in mental health research because of the multi-faceted nature of issues such as suicide (e.g. Morrison & L'Heureux, 2001; Zayas et al., 2005; Kidd et al., 2006). In fact, this theory has been used to guide similar studies looking at sexual active and culturally diverse participants - specifically those with low socioeconomic statuses (SES) (Corcoran, 2000; Corcoran & Franklin, 2002). This theoretical model suggests that there are different levels of influence – individual, family, and community - that impact most social phenomena. The ecological systems framework contributes to this particular project because its focus on community, familial, and individual-level influences provides a broad foundation for which to understand the relationship between sexual behavior and suicide.

The Current Study

Instead of studying the lives of individuals who have completed suicide, one method of studying suicide that has been embraced by the academic community is focusing on factors that are known to be closely linked to it, such as suicidal ideation (US Department of Health and Human Services, 2001; Leitner, Barr, & Hobby, 2008). For that reason, in order to better understand the relationship between sexual behavior and suicide, suicidal ideation among Mexican youth living in central Mexico will be the primary focus of this project. We set forth two hypotheses:

1. Youth who have ever had sexual relations will have increased suicidal ideation

2. In conjunction with previous research showing a connection between adolescent sexual behavior and suicide, other factors related to sexual behavior (e.g., number of sexual partners) will also be positively associated with increased levels of suicidal ideation.

Method

The data for this study come from a research project implemented at alternative high school centers in Guanajuato, Mexico in 2007. Eight of these centers were randomly chosen from a larger pool of 137 schools. The purpose behind the creation of these alternative schooling centers was to address the needs of students from low income families who did not have access to a traditional high school. The participants are unique not only because of the schools they attend, but also because the majority live in rural areas of a state that has one of the highest rates of migration to the US in all Mexico (Massey, Durand, & Malone, 2002).

Under the direction of the university research team, school psychologists and instructors facilitated the distribution and collection of questionnaires to consenting students. The questionnaire was tailored for Mexican adolescents. Straightforward questions and uncomplicated response categories were used to facilitate understanding (e.g., “In your home is there enough money to buy food?”). These have been shown to work well with migrant Spanish-speaking populations from Mexico (Knight et al., 2009). There were 702 students who participated in the study, resulting in an overall response rate of 95%. The final sample did not include individuals who were married or living in a free union, and

was comprised of 651 youth (61% female) between the ages of 14 and 24. While some students were not within the traditional age range of high school students, 90% of respondents were between the ages of 14 and 18. This study was approved by the Arizona State University Internal Review Board under exempt status 7.4.

Variables

The dependent variable for this study, suicidal ideation, was measure by asking, “During the past week, how frequently did you: 1) Feel that you could not go on, 2) have thoughts about death, 3) feel that your family would be better off without you, 4) think about killing yourself.” Originally there were 4 response categories: Not once, 1-2 days, 3-4 days, 5-7 days, but due to the strongly skewed distribution, the variable was dichotomized (0=No ideation during the past week; 1=Ideation during the past week). This scale has been used in previous studies conducted in Mexico (González-Forteza et al., 1998), and the internal reliability of the scale in this study yielded a Cronbach’s alpha of .777.

The primary independent variables for this study are ever having sexual relations (0=No; 1=Yes), lifetime number of sexual partners (1=1; 2=more than one), sexual activity within the past 3 months (0=No; 1=Yes), and whether or not some type of birth control was used during their most recent sexual experience (0=No; 1=Yes). Variables to be included in each of the models are gender, age, SES, and parent-child relationship. Gender (0=Female; 1=Male) has been found to contribute to the shaping of one’s behavior (Moon et al., 1999; Slater et al., 2001), and gender roles are very different in Mexican society as compared to other countries such as the US (e.g., Gutmann, 1996; Hardin, 2002; Jelin, 2005;

Kulis et al., 2003, 2008; Lirio et al., 2007; Marsh & Myers, 1986; Reyes Luna et al., 2004; Ricciardelli & Williams, 1995; Rocha-Sanchez & Diaz-Loving, 2005). Furthermore, it has been found that females are much more likely to struggle with suicidal ideation than are males (Zayas, 2000; Zayas et al., 2005). SES was measured by asking the respondents 5 questions, “In your home, is there enough money to: Buy food, buy gasoline for your car or truck, pay for basic services (light, water, etc), buy clothing you need, do fun things (take vacations, go to the movies, go out).” The response categories were 0=Never, 1=Sometimes, 2=Almost always, 3=Always, and the internal reliability of this scale was found to be well within the acceptable range ($\alpha=.854$). The parent-child relationship measure came from two questions: “How would you describe your relationship with your mother,” and “how would you describe your relationship with your father.” Responses ranged from 0=Bad to 4=Excellent. The mean of both responses was calculated for each youth; or, if they only had one parent, the score from the one parent was used. This measure was included because studies have found that stronger parent-child relationships are associated with reduced suicidal ideation (US Department of Health and Human Services, 2001).

Analysis Strategy

After descriptive statistics were run using SPSS software, STATA software was used to run the logistic models. The first logistic regressions were run using the entire sample, and tested to see whether ever having had sexual relations was significantly associated with suicidal ideation while controlling for demographic variables and parent-child relationship. The next set of logistic

regressions were completed with a subpopulation including only cases where youth had previous sexual relationships. Logistic regressions focused on testing whether other sexual behaviors (i.e., lifetime number of sexual partners, sexual activity with the past 3 months, and use of birth control during their most recent sexual experience) were associated with suicidal ideation while controlling for demographic variables and parent-child relationship. The use of STATA was needed in order to control for nesting effects that could result from the students being in 8 different schooling centers. Because of the aforesaid differing gender role expectations in Mexico, interaction models were run to see if gender moderated the relationship between the sexual behavior measures and suicidal ideation.

Results

Table 1 shows descriptive statistics for each variable included in the analyses. The average participant age was 16.60 years ($SD=1.39$), and 62% were female. Most students had between a “good” and a “very good” relationship with their parents ($\bar{x}=2.88$; $SD=0.87$). With regards to current suicidal ideation, more than half the sample reported having suicidal thoughts during the past week ($\bar{x}=0.57$; $SD=0.50$). Almost one out of 5 participants reported having ever engaged in sexual relations (18%). Within that group almost half reported having more than 1 sexual partner ($\bar{x}=1.48$; $SD=0.50$), the majority had engaged in sexual relations during the past 3 month ($\bar{x}=0.60$; $SD=0.49$), and approximately $\frac{3}{4}$ of them had used some method of birth control during their most recent sexual encounter ($\bar{x}=0.71$; $SD=0.46$).

Table 2 shows the models testing whether ever having engaged in sexual relations was significantly associated with suicidal ideation. Block 1 shows the odds ratios and confidence intervals for the descriptive variables, and block 2 shows that ever having sexual relations was not a significant predictor of suicidal ideation (OR=1.48; CI=0.90-2.43). However, gender and parent-child relationship were both significant in the final model (Gender OR=0.67; CI=0.46-0.98; Parent-child relationship OR=0.65; CI=0.53-0.81), showing that females and those with poorer parent-child relations had higher odds of suicidal ideation.

Table 3 shows the models testing whether number of sexual partners, having sex in the past 3 months, and using birth control during last sexual relations were predictive of suicidal ideation. Block 1 shows the odds ratios and confidence intervals for the descriptive variables, and block 2 shows that number of sexual partners (OR=0.69; CI=0.27-1.79), having sex in the past 3 months (OR=0.66; CI=0.26-1.67), and using birth control during last sexual relations (OR=1.05; CI=0.39-2.80) were not predictive of suicidal ideation. The only control variable that was significant was parent-child relationship (OR=0.58; CI=0.34-0.99); thus, as would be expected, models testing gender as a moderating variable between sexual behavior and suicidal ideation were not statistically significant, and are not shown in either table. The only covariate that showed a consistent significant pattern across the models was parent-child relationship. In each model, weaker parent-child relationships predicted increased suicidal ideation during the past week.

Limitations

There are various limitations to this study that result from it being a cross-sectional secondary data analysis. For example, not all the desired variables were available in the dataset. In addition to suicidal ideation, questions asking about suicidal behavior, suicide attempts, and socially inappropriate sexual interaction (e.g., child sexual abuse) would have assisted the researchers to broaden their understanding of the relationship between sexual behavior and suicide. Future studies in Mexico should focus on eliminating time-ordering problems by conducting longitudinal studies, and seek to build off the results of this exploratory study by including additional suicide variables.

Discussion

The purpose of this study was to investigate the association between sexual behaviors and suicidal ideation among Mexican adolescents. The research hypotheses asserted that, as has been found in other countries such as the US (King, Schwab-Stone, and Flisher, 2001; Kirby, 2002, Hallfors et al., 2004; Burge, Felts, Chenier, & Parrillo, 2009), those who had ever engaged in sexual relations will have increased levels of suicidal ideation. Also hypothesized was that other factors relating to sexual behavior would also be associated with higher suicidal ideation. These hypotheses were not supported by the results of this project. Contrary to our initial hypothesis, ever having sexual relations was not significantly associated with increased suicidal ideation in the full model, and number of sexual partners, having had sex during the past 3 months, and having used birth control during the most recent sexual encounter were not significant in

the second model among those who had engaged in sexual relations sometime in their life.

There may be various explanations as to why a connection between sexual behavior and suicide was not found among the youth in this sample. As previously mentioned, we seek to elaborate on these findings using the ecological systems model which takes into consideration different levels of influence (Bronfenbrenner, 1986). At the individual/familial level, research conducted by Zayas et al. (2005) in the US asserts that sexual behavior among young Latina girls puts a strain on the family relationships, thus leading to parent-child conflict, which is a strong predictor of suicide. However, among the participants in this study, the majority of those ever having engaged in sexual behavior were males (61%). Therefore, in addition to low power, Zayas' theory about the connection between sex and suicide among Latina youth may not be showing through in these results because of the high number of males included in the final analysis. However, even though the sexual behavior variables (micro level factors) were not significant, family (a mezzo level factor) was significant in each model, supporting previous findings on the protective power of a strong parent-child relationship (US Department of Health and Human Services, 2001).

Implications for Practice, Policy and Research

The findings from this study provide a foundation of knowledge to communities in Guanajuato, Mexico. Looking forward, this research should help inform future studies that seek additional understanding of these important issues. For those to whom these findings apply, action within the family (mezzo level)

can help preserve the mental health of youth in their communities. Although the sexual behaviors were not associated with suicidal ideation, the strength of the parent-child relationship was. Therefore, parents need to recognize the importance of connecting with their children, and children should be taught the importance of valuing the relationship they have with their parents. This information can be effectively disseminated by community mental health agencies, schools, and other public meeting areas (community centers, libraries, etc).

Future studies looking at the consequence of youth sexual behavior should take into consideration the findings from this exploratory study. Since some of the focal behaviors of this study have been previously shown to be related to suicidal ideation in other populations, addition research among other Mexican populations is warranted. As previously stated, low power and the uniqueness of the participants in this sample may be hiding the true relationship between the variables of interest and suicidal ideation. Furthermore, each of the predicting variables of interest looked at in this study were ‘healthy’ sexual behaviors, so future projects looking at the results of adolescent sexual activity should consider including ‘unhealthy’ sexual behaviors such as child sexual abuse and incest. By building off this foundation of knowledge, future research using strong methodological designs can continue to construct a clearer picture of the relationship between sexual behavior and suicidal ideation.

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Table 3a Descriptive Statistics for Paper 3

Variable	<i>N</i>	Mean	Range	Standard Deviation
Suicidal ideation	631	0.57	0-1	0.50
Ever had sexual relations	617	0.18	0-1	0.39
Number of sexual partners (1 or 2+)	111	1.48	1-2	0.50
Had sexual relations past 3 months	131	0.60	0-1	0.49
Birth control during last sexual relations	111	0.71	0-1	0.46
Gender (0=Female)	642	0.38	0-1	0.49
Age	643	16.60	14-24	1.39
SES	648	1.89	0-3	0.58
Parent-child relationship	637	2.88	0-4	0.87

Table 3b Logistic Regression Predicting Suicidal Ideation

	Model 1		Model 2	
	(N=560)		(N=560)	
	OR	95% CI	OR	95% CI
Ever had sexual relations			1.48	0.90 - 2.43
Gender (0=Female)	0.72 [†]	0.50 - 1.02	0.67*	0.46 - 0.98
Age	0.96	0.84 - 1.08	0.94	0.83 - 1.08
SES	0.97	0.72 - 1.32	0.94	0.68 - 1.28
Parent-child relationship	0.65***	0.53 - 0.80	0.65***	0.53 - 0.81
R ²	0.04		0.04	

[†]p<.10; *p<.05; **p<.01; ***p<.001

Note: R² estimates reported based on non-stratified models

Table 3c Logistic Regression Predicting Suicidal Ideation

	Model 1		Model 2	
	(N=98)		(N=98)	
	OR	95% CI	OR	95% CI
Number of sexual partners			0.69	0.27 - 1.79
Had sexual relations past 3 months			0.66	0.26 - 1.67
Birth control during last sexual relations			1.05	0.39 - 2.80
Gender (0=Female)	1.01	0.41 - 2.50	1.23	0.45 - 3.34
Age	0.87	0.67 - 1.13	0.91	0.69 - 1.21
SES	1.09	0.48 - 2.48	1.28	0.52 - 3.14
Parent-child relationship	0.68	0.40 - 1.14	0.58*	0.34 - 0.99
R ²		0.04		0.06

†p<.10; *p<.05; **p<.01; ***p<.001

Note: R² estimates reported based on non-stratified models

Chapter 5

Conclusion

Major Findings

Each of the articles presented in this document provide new information that enhances our understanding of suicidal ideation among youth in Guanajuato. The first manuscript looked at the connection between suicidal ideation and migration aspirations, and the findings indicated that recent suicidal thinking predicted migration aspirations to the US. This contradicted the initial hypothesis, and also seemed to contradict previous research on the healthy migrant theory (e.g., Shai & Rosenwaike, 1987; Sorlie, Backlund, Johnson, & Rogot, 1993) and the health of first generation migrants (e.g., Hovey, 2000; Ponizovsky, Ritsner & Modai, 1999; Potter et al., 2001; Wadsworth & Kubrin, 2007). Another interesting finding showed that the migration aspirations of females were influenced by unique factors such as SES, previous time in the US, and the parent-child relationship - factors that did not show any significant effects among males.

The second manuscript reviewed prominent theories explaining the connection between religiosity and suicide. With the use of new measures and an international sample, this paper analyzed the connection between two aspects of religiosity and recent suicidal ideation. The results showed that internal religiosity was not connected to suicidal ideation, while students with higher levels of external religiosity were less likely to struggle with recent suicidal ideation. These findings supported previous research by theorists such as Helliwell (2007), but

contradicted some of the findings of other researchers (e.g., Fiala, Bjork, & Gorsuch, 2002; Nasim et al., 2006).

The third manuscript focused on various aspects of adolescent sexual behavior, and looked at their connection to recent suicidal thinking. While none of the behaviors were significantly associated with suicidal ideation, the strength of the parent-child relationship was significant in each of the full models. These findings were contrary to our initial hypotheses that sexual behavior among youth would be associated with higher suicidal ideation, as has been found in research conducted in other countries (e.g., King, Schwab-Stone, and Flisher, 2001; Kirby, 2002, Hallfors et al., 2004; Burge, Felts, Chenier, & Parrillo, 2009).

Each of the manuscripts addressed the topic of suicidal ideation in a unique manner, but the results of the 3 papers have noteworthy commonalities. The most obvious connection between the papers is the behavior of the parent-child relationship variable. Of the different models run between the 3 papers, 70% of them showed the parent-child relationship variable as having significant effects. It goes without saying, therefore, that a strong parent-child relationship is a protective factor against suicidal ideation among youth in Guanajuato. This finding is supportive of previous research in other countries on similar topics (e.g., Blake et al., 2001; US Department of Health and Human Services, 2001).

Another interesting connection between the papers was the gender differences. As discussed previously, males and females in Mexico, and especially in Guanajuato, are treated differently by their parents and by society in general (Jelin, 2005; Kandel & Massey, 2002; Kulis et al., 2008; Lirio et al.,

2007; Marsh & Myers, 1986; Reyes Luna et al., 2004; Ricciardelli & Williams, 1995; Rocha-Sanchez & Diaz-Loving, 2005). The previous research was strongly supported by the models in the migration aspirations and religiosity papers, as well as in one of the sexual behavior models. However, despite frequently being a statistically significant covariate, none of the interaction models in any paper showed gender as a moderating variable between the independent and dependent variables. As suggested in the manuscripts, low power may have been a contributing factor behind the lack of significant in those models.

Use of Theory

There were 3 main theories that served as a guide for the manuscripts: Stack's religious commitment theory (1983), Bronfenbrenner's ecological systems theory (1986), and Bogenschneider's risk/protection theory (1996). While the purpose of these manuscripts was not to test the basic assumptions of these theories, a review of their impact on the findings shows some unexpected patterns among both Bronfenbrenner's and Stack's original ideas.

The first and third papers (Suicidal Ideation and Migration Aspirations; Sexual Behavior and Suicidal Ideation) utilized the ecological systems theory (1986). In his original 1986 article, Bronfenbrenner asserted that people's thinking and behavior is influenced by many people and institutions on various levels, such as the individual level (i.e., micro), the familial level (i.e., mezz), and the community level (i.e., macro). The results of the first paper showed that the student's migration aspirations were indeed influenced by each of the three levels; however, there were gendered differences in the extent to which the different

areas of influence impacted their migration aspirations. The models show that female migration aspirations were more heavily influenced by micro and mezzo level factors such as their relationship with their parents, while male migration aspirations were influenced more heavily by macro level factors such as community expectations. These unexpected patterns pose interesting questions for future research using this theory. Do the different levels of influence (i.e., micro, mezzo, macro) impact male and female behavior differently? If so, is there a distinct pattern, such as males being more heavily influenced by macro level factors? While similar gender patterns were not found in the third paper, the results were discussed in light of Zayas' mezzo level theory regarding parent-child relationships and Hovey's macro level religious ideas regarding the influence of the Catholic Church in Mexico. These differing explanations surrounding the connection between sexual behavior and suicidal ideation spur additional questions about Bronfenbrenner's theory. For example, generally speaking, which of the three levels (i.e., micro, mezzo, macro) is the most influential on an individual's thinking and behavior? What types of behavior (e.g., social, risk-taking) are most strongly connected to micro levels of influence? Mezzo? Macro? Future research looking to expand on Bronfenbrenner's theory may benefit by analyzing these questions stemming from the results of papers one and three.

The second paper (Religiosity and Suicidal Ideation) was guided in part by Stark's religious commitment theory (1983). This theory asserts that, regardless of religious organization, life-preserving religious teachings (e.g., we are

accountable for our actions to a higher being) are protective against suicide. Since the paper presented in this document used suicidal ideation instead of suicide and did not have the depth and reach of Stark's original study, a direct test of his theory was not conducted; however, using alternative variables (e.g., suicidal ideation), an indirect test of his theory was conducted. As previously shown, internal religiosity was not protective against recent suicidal thinking among the Guanajuato student's in our sample. This finding leads to various questions for researchers seeking to expand on Stark's original theory. Why would religious teachings be protective against suicide, but not suicidal ideation? Do religious teachings influence adolescent suicidal ideation differently than adult suicidal thinking? Testing such questions would broaden the influence of the religious commitment theory.

Implications

The results of these three articles will not only add to our academic and theoretical understanding of suicidal ideation in Mexico, but can also contribute to discussions about improving policy and mental health services. One of the main concerns that arise when discussing adolescent mental health policy is the idea of access to services. Members of the research team that collected the original data noted that many of the adolescents who participated in the study lived in rural communities and locations that did not have the necessary mental health services. As more than half the participants reported current suicidal ideation, perhaps the most important step is for policy makers to address the need for such services. Without trained professionals to assist these youth they have no alternative but to

cope on their own, with perhaps just the support of a close friend or family member who they bring into confidence. Indeed, this lack of adequate services may be a strong contributor to the high percentage of youth suicides in Guanajuato (see Chiapas, 2008).

While policy makers in Guanajuato do not have the responsibility or ethical right to sway personal religious decisions, they should be able to influence the connection identified between suicidal ideation and migration aspirations. For example, they might consider creating a culturally specific suicide prevention effort that address the unique migration culture present in the communities. Also, as each of the studies identified the parent-child relationship as a key factor influencing adolescent suicidal ideation, policy makers should find ways to help create awareness of this connection, and then disseminate resources regarding how to strengthen the parent-child bond.

Policy makers are not the only professionals that can benefit from this research - mental health service providers can also utilize this information to improve their practice. Indeed, it is imperative that those mental health professionals that do have access to Guanajuato adolescents in the video high school programs recognize the impact that religion and sexual behavior have on suicidal ideation, and the influence of suicidal ideation on the adolescent's migration aspirations. If these topics are not addressed, it is possible that some of the factors associated with and potentially leading towards suicidal ideation will not be fully understood. This could lead to an inadequate service plan and cause frustration within the worker-client relationship. Furthermore, service providers

should consider conducting their own research to see if these factors are not just connected to suicidal ideation, but also to suicide attempts and completed suicides.

Future Research

These studies addressed unique topics that have historically received little academic attention in Mexico. They also provide a strong foundation from which future research projects can build. Such studies should seek not only to see if these findings are replicable in other regions of Mexico, but should also strive to use better measures and a sample with greater generalizability. For example, future samples should include adolescents who attend traditional high schools, as well as youth who have stopped attending school. It would also be beneficial to know if there are also connections between suicidal ideation and migration aspirations, religiosity, and sexual behavior among adults over the age of 24. Also, longitudinal studies would allow future researchers to draw causal conclusions and erase any time ordering concerns.

With regards to measures, more comprehensive internal and external religiosity scales are needed. Also, when looking at migration aspirations, more information about how long the students planned to be in the US and specifics surrounding why they wanted to go there (e.g., visit family, vacation, etc) would provide further insights into the connection between suicidal ideation and migration aspirations. Lastly, additional suicide measures (e.g., suicide attempts, last suicide attempt, first suicide attempt, number of suicide attempts, and completed suicides) would provide a clearer picture of the relationship that

adolescent migration aspirations, religiosity, and sexual behavior has with all stages of suicide from ideation to completion. By improving and expanding on these studies, future research will continue to enhance our understanding of adolescent mental health in Mexico, and will help policy makers and mental health professionals as they seek to improve the lives of those they serve.

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APPENDIX A
ASU IRB PERMISSIONS



To: Flavio Marsiglia
UCENT

fo **From:** Mark Roosa, Chair *SR*
Soc Beh IRB

Date: 07/12/2010

Committee Action: Renewal

Renewal Date: 07/12/2010

Review Type: Expedited F7

IRB Protocol #: 0610001162

Study Title: Guanajuato Youth and Family Health

Expiration Date: 07/11/2011

The above-referenced protocol was given renewed approval following Expedited Review by the Institutional Review Board.

It is the Principal Investigator's responsibility to obtain review and continued approval of ongoing research before the expiration noted above. Please allow sufficient time for reapproval. Research activity of any sort may not continue beyond the expiration date without committee approval. Failure to receive approval for continuation before the expiration date will result in the automatic suspension of the approval of this protocol on the expiration date. Information collected following suspension is unapproved research and cannot be reported or published as research data. If you do not wish continued approval, please notify the Committee of the study termination.

This approval by the Soc Beh IRB does not replace or supersede any departmental or oversight committee review that may be required by institutional policy.

Adverse Reactions: If any untoward incidents or severe reactions should develop as a result of this study, you are required to notify the Soc Beh IRB immediately. If necessary a member of the IRB will be assigned to look into the matter. If the problem is serious, approval may be withdrawn pending IRB review.

Amendments: If you wish to change any aspect of this study, such as the procedures, the consent forms, or the investigators, please communicate your requested changes to the Soc Beh IRB. The new procedure is not to be initiated until the IRB approval has been given.

1. Principal Investigator	
Principal Investigator: Flavio F. Marsiglia	
ASU department address: 411 N. Central, Ste. 720, Phoenix, AZ 85004; SIRC @ Mailcode 4320	
E-mail address: marsiglia@asu.edu	
Phone number: 602-496-0700	Fax Number: 602-496-0958

3. Protocol Status
3a) Active: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (If no, submit a close out report: http://researchadmin.asu.edu/compliance/irb/apply/closeoutASU.doc)
3b) Please indicate remaining duration of the study: Through 2010 (anticipated completion of data analysis)

4. Participant Information
4a) Is this study closed to enrollment of new subjects: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
4b) Total number of participants approved for the study (to be enrolled): 2500
4c) Number of participants enrolled during the past approval period: 0
4d) Total number of participants enrolled since study began: 702
4e) Total number of participants screened in the past approval period (if applicable): 0
4f) Of the total participants screened in the past approval period, what percentage has been ineligible to participate in the study (if applicable)? N/A
4g) Number of participants who withdrew from the study: 0 Please state the reason(s) the participant(s) withdrew.

Co-	4h) Number of participants still to be enrolled: 0 (If this brings the sample to greater than what is listed in 4b, submit a request for modification see 7c).
	4i) Participant enrollment breakdown by gender, age and ethnicity: (This information is required for all studies that are NIH-sponsored. It is recommended, but not required, that other researchers provide this information).

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2. Protocol Information
2a) Title of protocol: Guanajuato Youth and Family Health
2b) HS #: 0610001162
2c) If project is funded or funding is being sought, provide list of all sponsors and grant numbers: N/A Please indicate the grant status for each source of funding: <input type="checkbox"/> Active <input type="checkbox"/> Pending
2d) ASU account number/project number: N/A
2e) Location(s) of research activity: N/A
2f) IRB approval dates from additional institutions: N/A <i>*Please note that copies of current IRB approvals from additional institutions are required.</i>