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Understanding Mental and Behavioral Health of American Indian Youth: An Application

of the Social Convoy Model

by

Jerreed D. Ivanich

Presented to the Faculty of

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UNDERSTANDING MENTAL AND BEHAVIORAL HEALTH OF AMERICAN

INDIAN YOUTH: AN APPLICATION OF THE SOCIAL CONVOY MODEL

Jerreed D. Ivanich, Ph.D.

University of Nebraska, 2018

Advisors: Kirk Dombrowski and Dan Hoyt

Objective: The purpose of this dissertation was to examine three distinct, yet related studies. The primary focus of each chapter is the examination of mental and behavioral health among North American Indigenous (American Indian, Alaska Native, and Canadian First Nations) youth - motivated by relational perspectives.

Method: Data for this dissertation came from baseline data of a larger randomized control trial of a culturally adapted evidence-based substance use prevention program among 375 youth and 304 caregivers across four reservations that share a similar language, history, and culture.

Study 1 Results: The aim was to examine caregiver and youth agreement on internalizing and externalizing symptoms and identify unique predictors of agreement between youth and caregiver. This study shows that caregivers perceive significantly fewer internalizing symptoms compared to youth self-reports. Externalizing problems, were not significantly different between caregivers and youth. Diverging patterns are found that significantly reduce disagreement for internalizing compared to externalizing.

Study 2 Results: The aim was to examine the role of sibling influence on problem behavior. Using a dyadic approach, bivariate analyses as well as actor-partner interdependence models (APIM) were conducted. Correlations suggest self-reported happiness with female caregiver is associated with externalizing behavior. Older siblings showed significant within group differences for externalizing problem behavior scores based on

caregiver education level–caregivers with college degree or higher indicating the highest average externalizing scores relative to other education categories. No sibling/actor influences were noted in the API Models.

Study 3 Results: The purpose of this study was to explore problem behavior among Indigenous youth using individual social convoy characteristics as predictors of externalizing behavior. Consistent with the extant literature, females, when compared to male counterparts, had significantly lower externalizing problem behavior. Self-reported mastery remains significant in multivariate regression analyses. Interaction between network size and being connected to a caregiver in the networks is also a significant predictor of externalizing behavior.

Conclusion: These three studies individually and collectively demonstrate the benefits of taking a relational approach to understand problem behaviors among Indigenous youth. Further, this dissertation fosters support for prevention models that aim to reduce mental and behavioral health problems in relational contexts.

Dedication

For the three women that will forever be my light, my compass, and my motivation: Emily Alice Ivanich, Scarlett Rain Ivanich, and Norah Winter Ivanich.

Acknowledgments

It would be foolish to assume that the completion of this dissertation and this degree was an accomplishment achieved on my own. I cannot count the number of times, during my pursuit of this degree, that I have heard family and old friends recount my early experiences as a student and my negative feelings towards school. It is often the case that these reflections are issued as a informal analysis of the unlikely case that I ended up pursuing this current degree. However, they failed to account for several key confounding factors in their analysis. It is here that I would like to point out some of the omitted factors of their analysis that led me to this degree. More importantly, beyond my silly analogy, this space is to acknowledge those that supported, inspired, mentored, and loved me through the process.

Emily, my wife, has changed my life in so many ways for the better that this small acknowledgment will fail to capture. The stark contrast between her life and future trajectory and mine was hard to miss when we first met – even as a high school student. She supported my decisions and guided me to better decisions without ever speaking a word. She is the rock on which all of my efforts are built. I thank Emily for always seeing the man I could be and not just the man I am currently. She is steadfast and unmovable in her desire to do good for others. She has taught me the value of slowing down, listening, and the value of finesses over brute force when setting out to accomplish my goals. Nearly every single night for eight and a half years she has scratched my head to calm me down and ease my mind off the tasks that are ahead of me. I thank Emily for her support, sacrifices, and love – all of which help me succeed. I borrow a couple lines from our wedding song to remind her that those words are just as true today as they have ever been, *"I wanna*

steal your attention like a bad outlaw, I wanna stand out in a crowd for you–a man among men, I wanna make your world better than it's ever been. And I'm gonna love you like nobody loves you. And I'll earn your trust making memories of us." Thank you for being my firm foundation. I love you!

I am grateful for Scarlett Rain and Norah Winter. They have taught me that being an academic does not have to be my first identity. They have taught me the value of leaving work at work. My daughters surprise me every single day with new lessons I need to learn. Scarlett reminds me everyday the importance of continuously asking questions. "It is how I learn" she reminds me. The sweet humility of being willing to ask is an example I hope to embody more often. Scarlett will be the glue that binds my family together in the future. She is kind, soft, caring, and loves for everyone to get along. What an amazing blessing she is in my life now, and what a blessing it is to see that unique quality in her so early in life. Norah, my mini-me. Norah (often and loudly) reminds me to put down my work and focus on playing with her and her sister. Norah's smile and laugh is infectious, it is hard not to love her. She is so independent and strong. I will not have to worry about shielding her from the world. Her fierce independence is a constant reminder of the capability we all have within us–a lesson I have needed to revisit many times during my time as a graduate student. These two girls make me a better person, father, academic, and husband. Thank you!

My Mother, Valerie, is my biggest fan. Since I was a little child my mother has always supported me. If that was my weird obsession with Kiss or wanting to grow tomatoes in our crowded apartment, she was there to take me to a Kiss concert in third grade or to buy me an in-home tomato growing kit. It kills her that we live so far apart, but we are so alike, that if we lived close I would probably kill her (just kidding, mom). Even with the distance I have never questioned my ability to lean on her when I need something. She has always been one phone call away. She is one of the few people in this world that

iv

knows how I am feeling without even having to ask. It is the reason she drives 12 hours in the snow to show up for the birth of my first born even though I told her I would be fine – she knew I really needed her. I thank her for passing several of her traits to me. I am not afraid to ask questions because she has never been afraid to ask questions; when others wait for an answer I seek it out and find it, because I have never seen my mom idly stand by and wait for her desired outcome; I put in hours of work because I saw her support me and my brothers at a time when no one else did. She is not a perfect person, none of us are, but she is the perfect mom.

To my late father, Richard Ivanich. I know that life was not easy for you. I know life held challenges for you that none of us would want to bear. In my mind you will always be superman, not the man in tights flying around stopping bad guys, but a big bear of a man that held me in his arms as I was young. The father that would rock out to Kiss on the way to my wedding. The man that never yelled at his sons without being the first to apologize and talk through what life lesson needed to be learned. A father that, even to those that despise you, still recognize your ability to be an amazing loving father to my brothers and me. I will never forget the countless sacrifices you made to ensure that I was taken care. I hope one day that I will be willing to do as you did. If that means secretly pawning my prized guitar to make sure that my children have tickets to their prom or graduation night, I will do it because you did it for me. I hope and pray that I will have the burning testimony of the truthfulness of the church of Jesus Christ of Latter Day Saints that resided in you and shined like a light on hill. You will not be forgotten, your grandchildren will know you, and your life will live on through the sons that you left behind. We will be representatives our father. A final thank you for making me the man I am today is due. You made sure that you not only led by good example, but also pointed out the times in your life that were not moments would like us to follow. I thank you for teaching me the correct and the incorrect paths to take in life.

Though I have been supported and loved by my two biological parents, Richard Ivanich and Valerie Ozella, I have been blessed with several other parents in my life that I would also like to acknowledge here. First, I would like to acknowledge Elisa Ivanich, my step mom. I thank her for her willingness to take on the heavy burden of supporting my father, me, and my brothers. In many ways she was never rewarded for her efforts and dedication. Though my father is gone, she will always be a part of my life and will always my children's grandmother. I smile to know that my children know you as grandma and that you are the "candy" grandma. Second, I would like to thank Mike Ozella for his efforts as my stepfather. He, like Elisa, took on the task of supporting me and my brothers when he did not have to. Beneath his sometimes rough exterior, he has proven time and time again that he cares for me and my siblings. What a joy it has been to see him bond with his granddaughters. I am grateful to have so many supportive parents in my life.

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vi

Funding

Contents

List of Figures

List of Tables

Chapter 1

Introduction

Adolescent American Indian health and well-being disparities have been documented for hundreds of years (Boyd, 1999; Jones, 2006), yet this population has been largely overlooked in relational literature. This dissertation addresses this gap in the Indigenous literature, by adopting a relational approach, namely the social convoy model. Indigenous culture promotes a kinship and relational perspective that is unique from mainstream American culture (Wexler et al., 2014). The omission in extant literature to explore adolescent Indigenous populations through a culturally congruent relational lens inhibits interventions and prevention programming efforts. Taking an empirically rigorous relational approach that is also culturally appropriate may provide a promising intervention and prevention programming route, not yet explored.

Efforts have been made to understand the mechanisms that contribute to health disparities of Indigenous youth. Health disparities for Indigenous populations have been documented in terms of suicide (Allen et al., 2014; Ivanich and Teasdale, 2017; Walls et al., 2007a; Wexler et al., 2012), depression (Beals et al., 2005; Whitbeck et al., 2002, 2009a,b), stress (Jiang et al., 2008; Walls and Whitbeck, 2011; Walters and Simoni, 2002), diabetes (Walls et al., 2014; Walter et al., 2016), deviance (Sittner and Hautala, 2016), and substance use/abuse (O'connell et al., 2007; Walls et al., 2006; Whitesell et al., 2009a, 2012, 2006a, 2014). The mounting body of literature focused on Indigenous health disparities is a call to action for health care practitioners and researchers to address disparities within this population in a meaningful way.

Relational approaches to understanding health and well-being have gained considerable favor among non-Indigenous populations (Valente, 2010). For example, Bearman and Moody (2004) used social relationships to better understand suicide risk and suicidal ideation and found that suicide attempts and completions within a social group increase suicidal thoughts among classmates. They also found that isolated females, and females with friends who do not reciprocate friendship are at an increased risk for suicidal ideation. In addition, Valente and colleagues (2004) synthesize the literature on taking a relational approach for understanding adolescent problem behaviors - such as substance use. Because social network models are sensitive to dependency structures, they find that social network analysis is a promising approach to understanding adolescent problem behaviors (Butts, 2009). Further, social network analyses allow for deep inquiry into key aspects of adolescent developmental stages (i.e. the heavy reliance on peers) and their behaviors (Crosnoe, 2000). They find that unique positions within a social structure (i.e., popularity, isolates, and liaisons) are important factors that are often difficult to measure in traditional surveys (Valente et al., 2004). The kinship and relational culture that is unique to Indigenous populations creates a powerful opportunity to utilize a relational approach to understanding disparities.

1.1 Indigenous Populations and Problem Behavior

The examination of problem behaviors among Indigenous populations have been well-documented. Though not exclusive to Indigenous peoples, an established body of literature has explored problem behaviors for American Indian and Alaska Native youth which includes, but is not limited to: conduct disorder, substance use, delinquency, physical fighting, and gang involvement. Problem behaviors among Indigenous populations may be exacerbated for several reasons: historical trauma, poverty, historical and contempo-

rary racism, and structural disruption to family structure. The central focus of this dissertation is to offer a deeper perspective of problem behavior among Indigenous youth. By isolating a few specific problem behaviors, I will focus on the precursors and contextual factors thought to be leading predictors of problem behaviors.

A primary concern across many Indigenous communities is the use of alcohol, tobacco, and other illicit substances by adolescents. In a comparison to national trends of substance use among non-indigenous youth, American Indian youth prevalence rates for marijuana, binge drinking, and prescription drug use were shown to be significantly higher (Stanley et al., 2014). While binge drinking and consumption rates appear to be high for American Indian and Alaska Natives, they also are among the highest rates of abstainers—thus contradicting the "drunken Native" stereotype (May, 1996). Some scholars have focused on the causes of substance use among Indigenous youth (see, Spillane et al., 2015; Walls et al., 2007b), others have focused on the effects of early substance use later in life for Indigenous youth (see, Whitesell et al., 2006b, 2009b), and others focus on prevention efforts for Indigenous youth (see, Allen et al., 2018; Stanley et al., 2017). This body of literature informs future prevention work, informs local Indigenous communities, and breaks stereotypes.

Violent behavior and/or delinquent behavior among Indigenous populations have been a central focus for many scholars. Sittner and Hautala (2016) argue that aggression and violent behavior is a salient social problem among American Indian youth due to increased suicide rates, victimization, and homicide. This is further supported by the fact that one in three adult Indigenous males in the United States will be incarcerated at some point in their life (Duran and Duran, 1995). Pridemore (2004) urges scholars to address violent behavior and delinquency among Indigenous populations using both a contemporary and historical lens and furthermore calls for scholars to utilize localized knowledge and culture as protective factors within the Indigenous research. Likewise, Hautala et al.

(2016) explore gang involvement of American Indian youth by examining both contemporary and historical factors that predict later gang involvement. Work in this area is expanding and has the potential for culturally relevant prevention efforts.

Problem behaviors do not often fit cleanly into singular categories; here other forms of problem behavior among Indigenous youth are discussed that have informed this body of literature. Sometimes connected to the discussion of violent behavior is the well-documented problem of Indigenous suicide. Suicide has been a notable problem for reservation dwelling Indigenous populations in the contiguous United States (Walls et al., 2007a), Alaska Native Populations (Allen et al., 2014; Wexler, 2006), and non-reservation dwelling Indigenous youth (Ivanich and Teasdale, 2017). Additionally, an emerging body of work on risky sexual behavior among American Indian and Alaska Native populations has marked the problems among Indigenous youth and points out the glaring omission of knowledge needed for prevention and intervention work (Eitle et al., 2015; Greene et al., 2018; Kaufman et al., 2007).

In summary, problem behaviors among Indigenous populations are of primary concern to both Indigenous community members and to scholars. In their book using longitudinal data among Indigenous youth Whitbeck et al. (2014b) provides a detailed overview of some of these concerns and others that are not found in this dissertation. Their work, and the work of this dissertation, aim to uncover the mechanisms that drive deviant behavior, the repercussions of problem behavior, and the potential for intervention work for this under-served population. For this dissertation, *problem behavior* is broadly used throughout all three studies to refer to primary outcomes of externalizing behavior – while also being used sparingly to refer to externalizing behaviors and internalizing symptoms in chapter 3.

1.2   The Social Convoy Model

One theoretical model that incorporates a relational approach to analyze problem behavior outcomes is the social convoy model (Kahn and Antonucci, 1980). The social convoy model contends that individuals are surrounded by other individuals who play a supportive role. These actors offer support to the individual and are nested within a structure of the individuals larger social convoy to carry youth throughout the life course, acting as buffers, aids, teachers, and other support. The social convoy model suggests that the people occupying an ego's social convoy take on unique roles. These roles offer differing levels of quality (e.g., negative or positive relationships), function (e.g., roles offered: caregiver, affirmation, and aid), and structure (e.g., composition, size, proximity, and availability) for the individual (Antonucci et al., 2013).

This model may be easily transferable to Indigenous youth. Figure 1.1 illustrates a hypothetical social convoy model that can be applied to Indigenous youth. In the center of the figure is the youth (sometimes referred to as the *ego*). At each concentric circle moving away from the ego reside individuals that occupy a role in the ego's life. The circles farther away from the center/ego are not as paramount to those that occupy rings closer to the ego. The first ring that surrounds the youth is often reserved for the ego's parents or caregivers. The second circle from the youth is often conceptualized to include other family members. The third concentric circle of the social convoy is often reserved for friends of the ego. The last circle of the social convoy is thought to include acquaintances and other social relations that are constant in the ego's life, yet provide little to no support for the ego. The term 'convoy' is a term borrowed by the original authors to evoke the image of protective layers (Antonucci and Akiyama, 1987). It should be noted that Figure 1.1 is an idealized conceptual model. It is possible, depending on the population, social context, developmental stage of the ego, and individual circumstances that an egos personal model may not exactly mirror the proposed model. Figure 1.1 is provided to illustrate the

conceptual model, not to be exclusive of individualized life experiences.

Figure 1.1: Social Convoy Model
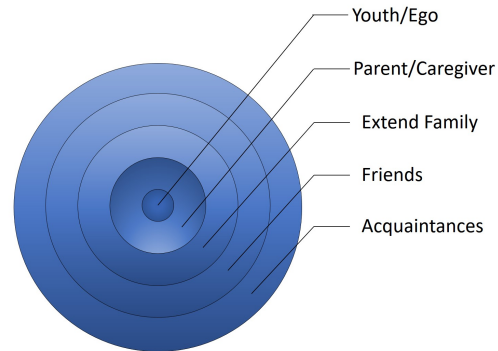
The social convoy model is argued to be useful for all social science researchers as it provides a framework for taking a relational approach, yet is amenable to diverse populations and cultures (Antonucci et al., 2013). The social convoy model has been extensively employed in the United States for White and Black populations, among Arab Americans, and Hispanic Americans (Ajrouch, 2005; Ajrouch et al., 2001; Levitt et al., 1992). The model has also been used on a global level; for example the social convoy has been used in research among Japaneses populations (Lansford et al., 2005) and Mexican populations (Villegas et al., 2014). The ubiquitous use of the social convoy model is largely attributable to the fact that the model provides a common conceptual framework of important social relations that can be adjusted for the population of interest.

It should be noted that the social convoy model has several similarities, yet some important distinctions, from the popular ecological systems theory of human development (Bronfenbrenner, 1977, 2009). The social convoy model and the ecological systems theory are both focused on the individual at the core of the theory. In both models, individuals are placed within a larger structure which has individual consequences. However, the models diverge in the scope of context assumed to be important for individual outcomes. For the social convoy model, as the name implies, individuals are thought to be part of social (relational) convoys. These convoys invoke imagery of a group of military vehicles

heading to a destination—each vehicle playing a different role to see the mission through successfully. Likewise, the social convoy model places a premium on social relations that carry a youth through the life course in a level of detail that not noted in the ecological systems theory as the ecological systems theory aims to incorporate other contextual factors beyond social relations.

Alternatively, the ecological systems model is much more concerned with a external and environmental contextual approach. For Bronfenbrenner, and those who have adopted the ecological systems perspective to understand the developmental process in question, one must understand the context in which an individual is embedded. More specifically, the ecological systems model posits that individuals are situated in five systems or environments. These five layers to the ecological system include the microsystem, the mesosystem, the exosystem, the macrosystem, and the chronosystem. Each layer or system, like the social convoy model builds around the individual in concentric circles to signify proximity and relevance, however, each layer is not restricted to relations. For the social ecological systems model, relations are only one aspect of the larger system, instead the emphasis extends to social conditions, formal institutions, political influences, informal institutions, and community wide factors. While the two frameworks have some similarities, the distinguishing characteristics of the social convoy model is the explicit focus on social/relational roles. The detailed focus on social relations to understand outcomes fits nicely with the Indigenous perspective and value on family, extend kin, and community and thus warrants its use here to assess Indigenous externalizing behavior.

1.3 Indigenous Social Structures

Anthropologists, ethnographic researchers, and social scientists alike have long been interested in the relational structures of American Indian and Alaska Native people (Dom-

browski, 2014). Qualitatively, it has been understood that kinship and friendship often plays a more significant role in the life of Indigenous people than for European White descendants living in America. One immediate example is the roles and frequency of contact that Indigenous people have with extended kin e.g., Aunts, Uncles, Cousins) (Walters and Simoni, 2002). For some, these roles can act as active buffers for the youth during times of risk and tumultuous periods. Within tribal communities, social and supportive roles are often thought to be filled by parents, grandparents, aunts, uncles, cousins, and other extended kin – as well as traditional peer friendships (Red Horse, 1997).

It is important to acknowledge that cultural, historical, geographical, and modern differences contrasting the vast number of federally, state, local, or unrecognized tribes. However, studies and ethnographic work have repeatedly documented the importance of social relations among North American Indigenous Tribal communities. The premium placed on kinship, extended kin, and overall community for Tribal communities when these social structures are explored through a historical lens and an understanding of the lasting impacts of colonialism. Prior to first contact, Indigenous peoples relied heavily on each other for everyday community survival (Heart and DeBruyn, 1998). Though dependency did not change, colonialism brought about many challenges to Tribal communities in terms of survival, health, sovereignty, and social structures (Snipp, 1989). For example, well after European White settlers arrived Tribal communities were forced to assimilate via boarding schools which created great disturbance to cultural practices, language, traditional teaching, and social interactions (Adams, 1995). In the midst of all challenges, one core source of support and resilience that remains today is the respect and value of social relations for many Tribal communities. Social relations as a core value to the way of life has been documented for communities in the plains (Fletcher and La Flesche, 1992a,b), the northwest (Trosper, 2002), the arctic (Patrick, 2013), the southwest (Dutton, 1983), and more (Klein, 1986; Waldman and Braun, 2009).

In sum, this history and modern social structures of Indigenous communities suggests that Indigenous youth should be uniquely embedded in social relations that protect youth. Though this remains a largely overlooked question in the literature that can be explored using the social convoy model. Given the reliance Indigenous people attribute to kin and community, taken with the extensive promise that the social convoy has shown working for various cultures, the application of the social convoy model for Indigenous youth is a promising conceptual framework to understand health disparities of Indigenous youth moving forward.

1.4   Aim and Overview of Chapters

The purpose of this dissertation is to examine adolescent Indigenous problem behavior and well-being through a relational perspective, using the social convoy model. The sample is made up of, youth residing on four reservations located in the Great Lakes region of the United States. All communities for this study share a common language and culture. To this end, this dissertation will approach problem behavior and well-being of Indigenous youth in three connected, yet distinct studies. Chapter 2 provides a history and overview of the Bii-Zin-Da-De-Dah (BZDDD) family program and data used for this dissertation. Chapter 3 will explore the parent/caregiver-child agreement on the youth's behaviors reported by the child behavior checklist (CBCL) and youth self-report (YSR) as part of the larger Achenbach System of Empirically Based Assessment (ASEBA) (Achenbach and Edelbrock, 1991). The second study included in this dissertation, Chapter 4, will introduce the social convoy model by using sibling and ego dyadic data, to explore externalizing behaviors for youth using an actor-partner interdependence model (APIM) (Kenny et al., 2006). In Chapter 5, the social convoy will be fully extended to include family, friends, and parent relations to explore the youths externalizing behavior in ad-

dition to social support and self-mastery. To accomplish this, I use the self-reported personal network information asked of the youth and connect it to the parents personal network to make a localized ecological social network for each youth in-line with prior work of ego networks (Crossley et al., 2015). The measures will then inform a larger regression analysis to understand the full effects of social convoys as predictors of externalizing problem behavior.

Chapter 2

Bii-Zin-Dah-De-Da: History and Current Study

2.1 History

The Bii-Zin-Da-De-Dah (bē-zen-dä-dē-dä; Listening to One Another; BZDDD) program was the first American Indian adaptation of the Iowa Strengthening Families Program (now called the Strengthening Families Program: For Parents and Youth 10-14) (Spoth and Redmond, 2002). This program has been developed and adapted in partnership with multiple Anishinabe communities over a span of 20 years. BZDDD has been enormously popular. It has been adapted for Dakota (AA015414), Lakota (NARCH,U261HS300288), Pueblo, and Navajo cultures and is currently the center piece of a Canadian National Mental Health promotion funded by the Public Health Agency of Canada (PHAC 6785-15-2009/9010952) where it is being culturally adapted for use by four Anishinabe First Nations (Ontario and Manitoba), eight Swampy Cree First Nations (Manitoba), Splatsin First Nation (British Columbia), and the two First Nations of Quebec and Labrador, one of which is French-speaking. For an overview of the history and cultural adaptation process of BZDDD since its inception, see the work by Ivanich and Colleagues (2018).

The Strengthening Families Program (SFP) was initially created to prevent and delay substance use among youth (10-14). What made the program unique was the focus on prevention at the family level. Youth were recruited into the program, however, to be eligible to participate, youth must have the support of a parent/caretaker who were asked

to join the program as well. The program was designed to increase family communication skills and to help youth use refusal skills among their peers. Originally the program was implemented with seven three-hour weekly sessions. Participants (youth and parents) would start with a meal as a group, have a one hour session with children, and a one hour session with parents, and time to reflect and practice lessons learned at the end of each session. The program has since been adopted across many different geographical locations (Kumpfer et al., 2010) and for a variety of different cultures (Kumpfer et al., 2008).

One of the significant drives behind the BZDDD project was the aim to target youth who are in a developmental epoch that is earlier in life that most substance use prevention programs. Prior work with our community partners suggest that youth in the communities have a history of early alcohol, marijuana, and nicotine exposure compared to other populations (Whitbeck et al., 2014a). Figure 2.1 is a revised illustration from Whitbeck and Armenta's (2015) work that details the life course of the cumulative rates of substance use by age. Two boxes are present in Figure 2.1, the box on the left represents the target age range of youth that BZDDD recruited compared to the box on the right that is a more normative target age range in the substance use prevention literature. It is clear here that youth in the partner communities are exposed to substances early in life.

Figure 2.1: Lifetime Prevalence of Alcohol, Marijuana Use, and Nicotine (Figure taken from a revised version of Whitbeck and Armenta, 2015)
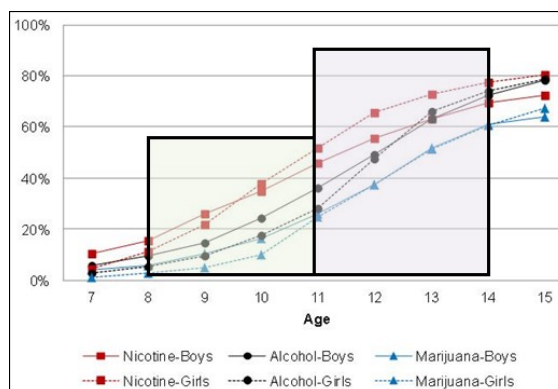
The target age range for BZDDD puts youth is a unique developmental epoch. Sul-

livan introduced the idea of developmental epochs or stages as a way to categorize and assess behavior within age contexts (1953). This dissertation explores topics and events that often are thought to emerge at later developmental epochs. The evidence presented in the Indigenous literature warrants the prevention program intervening at this point in the developmental stage of the youth, yet the findings and conclusions reside in a space that has been relatively unexplored in the literature for Indigenous youth of this age. Making the contributions important, yet should be approached with this unique limitation in mind.

2.2 Data

Data that will be used for this dissertation comes from baseline data from the Bii-Zin-Da-De-Dah (bē-zen-dä-dē-dä; BZDDD) program (R01DA03177, Whitbeck, PI). This project is an on-going multi-site randomized controlled trial (RCT) of a family-centered alcohol and drug prevention program for Anishinabe pre-adolescents aged 8-10 years. The program was delivered in four communities that all share a common culture and language. Participants enrolled in the program attended fourteen weekly sessions with a unique learning objective in each session. Sessions were designed to prevent/delay substance use, increase community engagement, increase parent-child communication, and increase traditional knowledge.

2.2.1 Recruitment

We used a school-based and community outreach recruitment strategy to recruit youth and their families. Our community advisory boards, called Prevention Research Councils (PRCs) agreed this would have a greater community benefit than the original approach of using tribal enrollment lists to recruit eligible families. To expedite recruitment, we cre-

ated an on-line family interest form that allowed our recruiters to obtain initial contact information for eligible families to schedule home visits. At the end of baseline recruitment, we collected a total of 496 on-line short interest forms in our four communities. Some of these entries were duplicates, incomplete, or they indicated they did not want to be contacted further about the program. From this, we had a total of 463 families whom we attempted to recontact for a home recruitment visit.

Once the short interest form was completed, the university team created a home recruitment packet where project staff met with families to get the necessary eligibility information to officially enroll families in the program. At the home recruitment visit, field staff completed the family program interest form and completed an information sheet on each eligible child. At this visit, families received wild rice and the youth received a green Bii-Zin-Da-De-Dah drawstring bag for their time learning about the program. We completed recruitment home visits with 385 families in our four partner communities.

2.2.2   Data Collection

Baseline interviews began in May 2017 and were completed in May 2018. All interview staff were hired and trained prior to baseline data collection. Training included ethics and human subjects certification, interviewing skills, and other administrative responsibilities. To date, we have 15 hired interviewing staff trained in our four partner communities. We completed 679 surveys with 304 families in our four partner communities. Data were collected using in-person interviews with a trained interviewer from the community in which the respondent lives. Data were collected from children in the target age range and from one parent/caregiver that will attend the program with the target youth. Each caregiver and child that completed the baseline survey received a $20.00 visa gift card for their time. After the initial baseline interview, the family was given a sealed envelope with

their group (i.e., control or treatment) assignment which was randomly assigned using computer software and unknown to the interviewer. All materials, processes, and surveys were reviewed and approved by our local research advisory boards called *Prevention Research Councils (PRC)* for community and culture appropriateness prior to university institutional review board (IRB) approval. All participants were informed of policies, risk and benefits, compensation and signed consent/assent agreement forms.

2.2.3   Data Descriptives - Overall

Table 4.2 presents descriptive statistics of youth and adults in the overall baseline data. Of the 375 youth included in this data, the average age of the youth is just over nine years old (9.10). Females make up 52% of the sample. The majority of the youth (88%) self-reported their race as being American Indian or Alaska Native. The same is true for adults, 92% of caregivers in the sample indicated that they were American Indian or Alaska Native. An overwhelming majority of caregiver reports came from female caregivers (87%). The average age of the caregivers was just over 40 years old with a standard deviation of 11.41 in a range from 22–76. Just over 80% of the sample said they live on reservation land and 44% of the sample reported an annual household income less than $25,000.

Table 2.1: Descriptives Statistics

Statistic	N	Mean	St. Dev.	Min	Max
Youth - Gender (Female)	375	0.52	0.50	0	1
Youth - age	375	9.10	0.91	7	12
Youth - Race (Native)	375	0.88	0.33	0	1
Adult - Gender (Female)	304	0.87	0.33	0	1
Adult - Age	304	40.18	11.41	22	76
Adult - Race (Native)	304	0.92	0.27	0	1
Lives off Reservation	304	0.19	0.39	0	1
Income Below $25K	304	0.44	0.50	0	1

2.2.4 Data Procedure Per Study

The different studies in this dissertation provide unique modeling and design considerations that do not allow for the same set of cases to be used across all studies. Chapter 3 uses 282 cases, Chapter 4 uses 62 cases/dyads, and Chapter 5 uses a total of 346 cases. As this dissertation takes a slightly different relational approach (i.e., parent and youth, sibling pairs, individuals nested within social convoys) to the questions at hand, the data selection is unique to each study. Moreover, within the relational perspectives of each chapter, missing data is also unique to each chapter and will also be discussed. The reader will find within each chapter a dedicated description of the data used in the *Data and Methods* section.

Chapter 3

Parent-Child Agreement on Emotional and Behavioral Problems Reported by the Child Behavior Checklist (CBCL)

3.1 Introduction

Youth are not afforded the same independence in seeking professional psychiatry that adults can, suggesting that youth rely on adults to recognize mental health needs to advocate on their behalf. (Sourander et al., 1999). A recent nationally representative study suggests that while almost half (47.9%) of youth meet clinical criteria for a mental health disorder, only 15.8% received mental health services (Burns et al., 2004). In the past decade other forms of care (namely, dental care) have increased nationally for youth in child welfare, however, mental health care services have not improved (Stein et al., 2016). Unlike child welfare studies, trends among office-based physicians suggests that youth are more likely to see physicians for mental health concerns. Specifically, the rate of diagnoses, medication prescription, and total visits have all increased for office-based physicians for youth compared rates over a ten-year period (Olfson et al., 2014).

Studies that focus on the mental health well-being of Indigenous youth paint a bleak depiction. Concerns about and the needs expressed for mental health services for Indigenous youth are drastically higher compared to their white counterparts (Whitbeck et al., 2014b). Manson's (2000) systematic review of the literature of American Indian and Alaska Native health and services found that over 2,000 journal articles have been pub-

lished illustrating the plight of American Indian and Alaska Native mental health disparities, yet research on the barriers and access to mental health care is sparse. More specifically, Manson only cites a few studies that have explicitly studied mental health service care. This omission in the Indigenous health literature should be of high concern given the detailed body of work demonstrating Indigenous youth mental health disparities.

Arguably, the adult best suited for identifying problem behavior and to initiate professional help is the parent or caregiver of the child. This rests heavily on the assumption that parents and caretakers are able to recognize psychiatric problems in the youth. For Indigenous youth, given their heavy reliance on kinship support, this may be even more true compared to non-Indigenous populations. This study aims to explore caregiver-child agreement on internal and external symptoms among an American Indian sample using the Child Behavior Checklist and the Youth Self-Reports (Achenbach and Dumenci, 2001).

3.2   Background

3.2.1   ASEBA and Agreement

The clinical literature has identified several factors that are important for caregiver-readiness to identify problem behaviors for their children. Caregiver-readiness to identify mental and or behavioral problem behavior for their child is typically measured by assessing caregiver ratings of child behavior and the child's self-report on the same set of behaviors; typically referred to as an *agreement*. In general, caregivers who are female and who are older tend to identify child problems earlier and more reliably (Upton et al., 2008). Uzark et al. (2003) found that younger children and wider parent-child age gaps significantly reduce the agreement between parties. Communication style and level are also found to

be important factors in caregiver-child agreement on problem behaviors (Rothbaum and Weisz, 1994). Compared to able-bodied youth, children with greater health risks (e.g., chronic illnesses) often have less caregiver-child agreement on problem behaviors (Waters et al., 2003).

One of the most commonly used instruments to assess youth functioning and problems is the Achenbach System of Empirically Based Assessment (ASEBA; also commonly referred to as the Achenbach) (Achenbach and Edelbrock, 1991). The Achenbach is a set of questions that assess youth problem behavior as well as other standardized measures for assessing DSM-oriented outcomes. One feature of the Achenbach is the focus of collecting information from the youth as well as other external reviewers of the same behavior. These reviewers are often parents and teachers. Multiple reports collected allow for cross-validation and assessment between youth reports and perceptions of others that are close to the youth.

The Achenbach has been used extensively to assess the agreement or concordance between youth and caregivers. Assessment of agreement between youth and caregivers using the Achenbach has been seen across age cohorts (Achenbach, 2002). It has also has been used to explore concordance between youth and caregivers in different countries (Achenbach et al., 2008; Rescorla et al., 2013). The Achenbach has a long history of being used to assess agreement within clinical settings (for a recent meta-analyses on this topic, see Rettew et al., 2009). Additionally, scholars have implemented the Achenbach to assess agreement here in the United States for the general population (Achenbach et al., 2005), specific subgroups (Cai et al., 2004; Toppelberg et al., 2013), and across gender (Gross et al., 2004).

Little is known about parent/caregiver agreement among Indigenous populations using the Achenbach. Several studies that focus on Indigenous populations have used the Youth Self-Report (LaFromboise et al., 2006; Whitbeck et al., 2001) to assess mental

health, resilience, and other problems. Likewise, several studies among Indigenous populations have used the Child Behavior Checklist to assess parents perception of youth mental health and behavior (Wall et al., 2000). However, few, if any, have coupled the Child Behavior Checklist with the the YSR to assess caregiver and youth agreement.

Although explicit studies that assess caregiver and child agreement among Indigenous literature is scarce, it has been documented that Indigenous youth are more likely to live in non-traditional nuclear family homes. Often Indigenousness youth live with younger mothers or extended family (Lonczak et al., 2007). The unique combination of a close-knit family system of interpersonal relations and non-traditional housing of Indigenous youth suggests that taking an empirically rigorous relational approach to assess caregiver-child agreement on problem behaviors—that is also culturally appropriate, may provide unique patterns of caregiver-child agreement. The omission in extant literature to explore adolescent Indigenous health through a culturally congruent relational lens, inhibits interventions and prevention programming efforts. Given the small amount of literature to build on for Indigenous youth and their caregiver agreement, this dissertation fills an important gap in the literature.

3.2.2   Current Study

The purpose of this study is to assess the agreement among parent/caregiver and youth reports of the Child Behavior Checklist (CBCL) for externalizing and internalizing problems.

Hypothesis 1a: Parent/caregivers with paired child will under report internalizing reports of their youth.

Hypothesis 1b: Parent/caregivers will identify externalizing problem behaviors at a

rate no different than their youth.

Further, this paper aims to identify unique characteristics of caregiver, child, and potentially caregiver-child interactions that foster higher levels of agreement. Here I propose that differences in caregiver/child agreement will be associated with demographic characteristics of both the child and caregiver and youth self-reported relationship with parent.

Hypothesis 1c: Mother/female caregiver reporters will have significantly lower disagreement scores compared to father/male caregiver reports.

Hypothesis 1d: Households of higher socioeconomic status homes will significantly reduce the level of disagreement between parent/caregiver and youth.

3.3   Data and Methods

3.3.1   Data and Sample

The overall sample of youth collected is 375 from a set of 304 families. The primary aim of this paper is to assess parent and child agreement. Parents were only asked to report of the randomly assigned *target* child for the intervention – not all eligible aged children living in the house. This reduced the sample to a total possible cases of 304. From this 304, a listwise deletion of 22 cases were excluded due to missingness for uniformity across all modeling.

3.3.2 Dependent Variables

To assess youth problem behavior and parent perception of child problem behaviors, parents complete the Child Behavior Checklist (CBCL) (Achenbach and Edelbrock, 1991) while the youth complete the Youth Self-Report (YSR) (Achenbach and Dumenci, 2001). Both are standardized scales frequently used in social science research (Bordin et al., 2013; Crijnen et al., 1999; Goodman and Scott, 1999; Ivanova et al., 2007; Perrin et al., 1991; Sourander et al., 1999). Yet, few studies have explored externalizing and internalizing explicitly provided by the Child Behavior Checklist and Youth Self-reports among Indigenous youth. In fact, few studies to date have used the standardized measure among Indigenous youth (see, Costello et al., 1996; Wall et al., 2000). Despite the lack of attention Indigenous scholars have afforded the CBCL and YSR, these tools have been highly effective in studies among the general population (Ivanova et al., 2007). The CBCL is designed to obtain the parent/caregiver perspective on the youth behaviors were the YSR gathers information about the youth from the youth directly. The scales were developed to assess psychopathology of youth 11-18 using 102 questions each. The questions mirror each other with their respective perspective (i.e., youth are asked to report on themselves about behaviors, while parents are asked the same question but their perspective of the youth). The CBCL and the YSR can be broken down into two major subscales - externalizing and internalizing. Additional subscales can also be reviewed using the CBCL and the YSR, but are beyond the scope of this paper.

The target age to be considered eligible for our study was 8-10 years old American Indian youth. For this reason, permission was granted by the Achenbach System of Empirically Based Assessment (ASEBA) to remove a total of six questions. Two questions removed focus of suicidal thoughts and attempts. Two items removed from the larger scale focused on sex and sexual thoughts. Lastly, community members serving as field interviewers and the local research advisory boards called *prevention research councils*

(PRC) asked that questions related to *hearing things that others do not hear* and *seeing things that others do not see* be removed, as there is a history of being shamed, and institutionalizing members of this American Indian community for similar cultural practices. For complete Youth Self-Report scale, see Appendix A - A.1; for the complete adult Child Behavior Checklist, see Appendix A - A.2.

3.3.3   Independent Variables

Demographic characteristics of the youth and the caregivers will be used for this study. Demographic characteristics include youth age, youth gender, youth grade, parent age, parent gender. In addition, demographic characteristics predictors will include a measure of the youths self-described relationship to their caregiver. For this, the youth were asked, "For the following questions, think about the parents or guardians that you live with now. First, thinking about your mom or adult female guardian. How happy are you with the way things are between you and your mom or female guardian?" The same question was then asked for their "dad or adult male guardian." The youth were able to select one of the following response options: "Very happy", "Fairly happy", "Fairly unhappy", "Very unhappy", "I don't live with my mom/dad or other female/male guardian", and "Refused."

3.4   Analytic Approach

For this study I take a three step approach to assess agreement between youth and the parent/caregiver per *hypothesis 1a and 1b*. For each stage of the analyses I examine externalizing and internalizing scores. To assess if parents/caregivers fail to identify youth problem behaviors (hypothesis 1a) I will use two tests. First test is to examine the correlations between youth YSRs and parent CBCLs using a Pearson's correlation. Second, I

use group means t-tests to compare the youth self reported symptoms and the adult's child behavior checklist scores on externalizing and internalizing scores. Similar approaches have been taking by investigators that aim to assess parent/caregiver and child agreement (López-Pérez and Wilson, 2015).

To assess the characteristics that are associated with more agreement between youth and caregiver–per *hypothesis 1b*, I created an absolute difference score for externalizing and internalizing by taking the absolute value of the parent score and subtracting the youth score. These absolute scores are measures of agreement, the closer to zero, the more adult and child agree. This score can then be used in a multivariate Ordinary Least Squares regression analysis to assess the characteristics of the adults, youth or interaction of characteristics that suggest high levels of agreement. Identifying these characteristics may be beneficial for targeted intervention and prevention work moving forward. This procedure follows the work of others in the field that explore caregiver and youth agreement (Berg-Nielsen et al., 2003).

3.4.1   Limits and Adequacy

To have a Best Linear Unbiased Estimator (BLUE) (Fox, 1991) several assumptions should be met for an OLS regression. First, the dependent variable should be continuous and normally distributed. Here this assumption is met, as the dependent variable is sufficiently continuous and normally distributed. Second, the dependent variable should have a non-zero variance. Meaning that the distribution of the dependent variable shows variation. Since the dependent variable is continuous and we have sufficient sample size, this assumption is relaxed – though it will be explored. Multicollinearity occurs when any given X_i variable is highly correlated with an additional X_j predictor variable in the model. This assumption will be further tested when data are available in regards to some of the youth

measures, namely age and grade. Autocorrelation is similar to multicollinearity but is concerned with correlation of repeated measures, this is not the case for the data in this study. The next assumption is that our error terms have a mean value of zero, suggesting that we do not have extreme outliers or that we do not have systematic errors biasing our linear estimator as a function of our x variable. Further validation and testing of the data will be done to assess our model meeting this assumption.

Additionally, one of the OLS assumptions is that the independent variables are un-correlated with the error term. In econometrics, this assumption is refereed to an endo-geneitiy problem. This problem is often considered a causality problem. We assume that our independent variables are uncorrelated with our error term for several reasons. It is first vital to understand that the error term is placed in our regression equations as a proxy for the unaccounted exogenous factors not accounted for by our X_1, X_2, X_k terms. Thus, if any given $COV[X_i, \varepsilon_j] = 0$ we would then assume that a cyclical process is taking place between our independent and dependent terms through some form of indirect relationship. Like autocorrelation, one possibility is that OLS is not the best model for the research question/data and alternative models should be used (e.g., Structural equation models, HLM, Survival analysis, etc.) Lastly, the assumption of Homoscedasticity can be under-stood in the root of the word it self. 'Homo' meaning same and 'Scedasticity' meaning variance. Therefore, when employing an OLS model we assume that our variance of the error term is the same or constant across the Y values based on our X terms. This substan-tively suggests that the error terms should roughly be the same for our Y as our X_i variable increases or decreases. If Homoscedasticity is not found in our data we violate this as-sumption and we have what is known as heteroscedasiticity. In formal terms we would note this as

$$VAR(\varepsilon_i|X_i) = f(X_i)$$

This suggests that our variance is in some way a function of or dependent on the linear relationship of X_i. If an OLS model were run while heteroscedasticity was present - we would see a bias in our estimator being pulled in whatever $f(X_i)$ is seen in the data and would then not be a true generalization to the population.

To identify if our data are sufficiently homoscedastic, we can run plots of our data such as q-q plots, residual vs fitted, Cook's distance, and others that are standard on programs like R. A more statistically rigorous method to asses if our data are Homoscedastic or not is through the use of a Breush-Pagan test. In cases that our assumption is violated, we can again perform transformations of our data such as log transformations or a box-Cox transformation.

3.5 Interpretation

In this section I will detail each proposed test. I will provide a brief discussion on the output provided by each test. Lastly, I will discuss how these tests provide insights into the overall tests of the hypotheses of this study and their implications for supporting or not supporting the expected hypotheses.

3.5.1 Correlation Results

Using a Pearson correlation, two variables are assessed for their linear relationship. Co-efficients produced by this test range from -1 and +1. Where a value of zero suggests no linear correlation and a -1 value suggests a negative correlation. Meaning, if the relationship between parent/caregiver perception of child externalizing behavior and child self-reported externalizing behavior is a -1, we would assume that as one variable positively increases, the other value decreases in a linear fashion. If a coefficient of +1 is noted, we

would assume that as one variable increases the other equally increases. For this study, we would assume that coefficients can roughly be interpreted to fall into several categories. A correlation of zero, no linear relationship; |0.30|or less, a weak linear relationship; |0.50|, a moderate relationship; and |0.70+|, a strong linear relationship (Agresti, 2007).

3.5.2   Group Mean t-test Results

Group means can be compared using a group means t-test. In this test, we assume that the data are continuous, drawn at random from the same population and sample size is sufficiently large to compare ($\sim$ 30+ for each group). This test formally compares μ_1 to μ_2 using a significance test under a t distribution. To obtain this statistic, we test the hypothesis that $\mu_1 - \mu_2 = 0$ in a t test:

$$t = \frac{(\mu_2 - \mu_1) - 0}{se}$$

We can then take the t value and compare this to the expected distribution to obtain a p-value for significance (Agresti, 2007). If the value is sufficiently large, we would reject the null hypothesis and state that the two groups are statistically different. For this study, I will compare the average score of youth and parents on externalizing score and internalizing score and obtain a t value and significance value. If the two group mean scores are significantly different I interpret this to mean that the parent/caregivers are not reporting symptoms and behaviors at similar rates – thus some form of discrepancy is present between the two groups.

3.5.3   Regression Results

To test *hypothesis 1b*, I will use an ordinary least squares regression model. Formally:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_k X_k + \varepsilon$$

Where Y is the dependent variable, α is the intercept, the $\beta_1 X_1 + \beta_2 X_2 + \beta_k X_k$s are the independent variables of the model, and ε is the error term. This model allows us to fit a model that attempts to explain the variance of y using these terms. The α term tells us the expected mean value of Y when all $\beta_k X_k$ variables equal zero. In a sense, this is our reference point. Each β_k values tell us that for each additional unit increase in our independent variable we would expect that our Y value would increase or decrease by the beta coefficient, all else constant. In addition to the raw beta coefficient produced for each independent variable, an associated p-value is given. The p-value for each term tests the null hypothesis that the coefficient is equal to zero (no effect). A low p-value (< 0.05) indicates that you can reject the null hypothesis. Conversely, a larger (insignificant) p-value suggests that changes in the predictor are not associated with changes in the response.

For this study, the Y value is the agreement score at the intercept or when all independent values equal zero. The higher the value the less parent/caregivers and child agree on child's given problem state. Each parameter in the model can either make this intercept value increase or decrease. For this study, I expect to identify characteristics that are associated with a significant decrease in the intercept, as this suggests that I have identified characteristics about the child, caregiver, or interaction that brings their agreement score closer.

3.6   Results

3.6.1   Univariate Results

Table 3.1 presents the descriptive statistics for all of the variables included in the study, including the dependent variable, independent variables, and the control variables. Just over half of the youth sample for this study were female (53%) and just over 9 years old. Conversely, 89% of our caregiver respondents were females. The average age of the caregivers in the sample was 39.77. A majority of the sample reported an annual household income less than $25,000 (0.43). The majority of our sample reported living on reservation land (83%) - though all recruiting and programing was conducted on the reservations, suggesting that the 17% that indicated they do not live on reservation land likely live very close. The majority of our sample indicated that they had some college or technical training (44%). Just under a quarter of the sample said they had a least graduated high school. A small percentage of the sample (9%) indicated that they had less than a high school degree. 19% of the sample were college graduates and 5% held advanced degrees. The overwhelming majority of the youth in the sample, 97%, reported having either a 'very happy' or a 'fairly happy' relationship with their mom or female caregiver (1), while 3% reported the opposite relationship with their mom or female caregiver.

3.6.2   Bivariate Results

Correlations

Table 3.2 presents the Pearson's correlation matrix of the CBCL and YSR internalizing and externalizing scores. We see high levels of internal consistency between the youth internalizing reports with their externalizing report (rho = 0.60; p<.001). Similarly, we see

Table 3.1: Descriptive statistics

Statistic	N	Mean/Proportion	St. Dev.	Min	Max
Youth - Female	282	0.53	0.50	0	1
Youth - Age	282	9.08	0.86	8	11
Caregiver - Female	282	0.89	0.31	0	1
Caregiver - Age	282	39.77	11.08	22	76
Income < $25K	282	0.43	0.50	0	1
Lives Off Reservation	282	0.17	0.38	0	1
Education - < HS	282	0.09	-	-	-
Education - HS	282	0.23	-	-	-
Education - Some College	282	0.44	-	-	-
Education - College Graduate	282	0.19	-	-	-
Education - Advanced Degree	282	0.05	-	-	-
Happiness w/Female Caregiver	282	0.97	0.17	0	1

that caregiver reports of youth internalizing and externalizing scores are also significantly correlated (rho = 0.63; p<.001). Beyond the within group correlation we see significant correlations across the caregiver and youth reports. For example, youth internalizing is significantly correlated with caregiver reports of internalizing reports (rho = 0.13; p<.05). Likewise, we note a moderate positive correlation between youth externalizing reports and caregiver reports of their youth on externalizing behavior (rho = 0.29; p <.001).

Table 3.2: Pearson's Correlation Matrix of the CBCL and YSR Internalizing Score and Externalizing Score

	1	2	3
Youth Internalizing (1)			
Parent Internalizing (2)	0.13*		
Youth Externalizing (3)	0.60***	0.14*	
Parent Externalizing (4)	0.13*	0.63***	0.29***

$^*p < .05; ^{**}p < .01; ^{***}p < .001$

Group Mean t-test Results

Group mean t-tests results are presented in table 3.3. We see that both caregiver and child reports are both significantly different from each other. For internalizing reports, we see

that the group mean of 7.86 for caregivers, yet we see an average internalizing score among the youth at a mean of 16.68 (t-value = 13.81; p<.001). While caregivers appear to report significantly fewer internalizing symptoms, table 3.3 suggests that caregivers report higher externalizing problem behavior, but this effect is not significant. Specifically, caregivers report and average score of 8.19, while youth report an average score of 7.70 (t-value = -0.86; p>.10). These group means are presented visually in figure 3.1.

Table 3.3: Parent/Caregiver and child group means t-test comparisons

| Scale | Parent/Caregiver | | Child | | t-value |
	Mean	SD	Mean	SD	
Internalizing	8.12	6.78	16.66	8.57	13.14***
Externalizing	8.44	7.55	7.74	6.57	−1.17

***p<0.001

Figure 3.1: Parent/Caregiver and Child group means
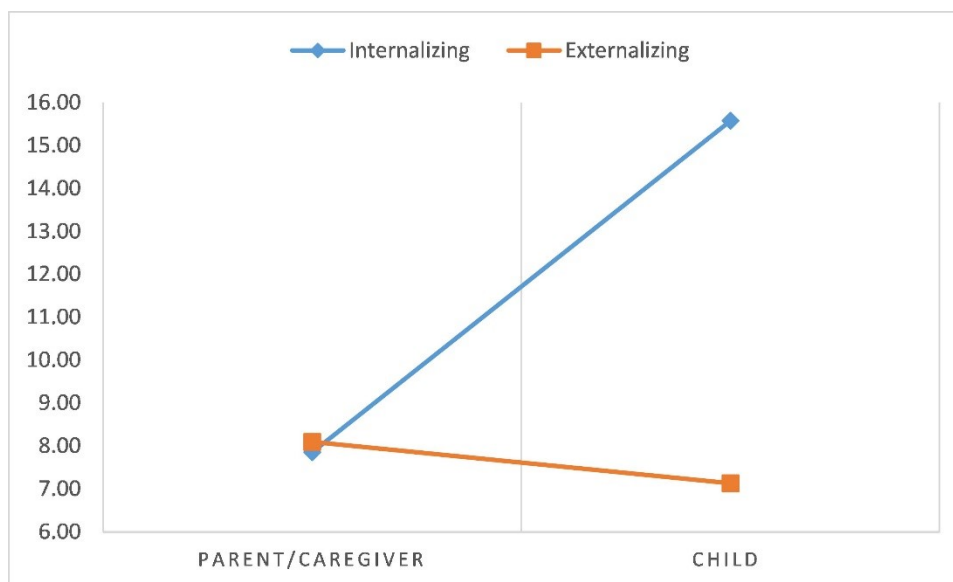
3.6.3   Multivariate Results

Internalizing

Table 3.4 presents the results of OLS regressions predicting agreement scores for internalizing symptoms between caregiver and youth. The intercept for model one is a score of 12.623. In model 1, age is treated as a factor variable, with age 8 serving as the reference group. Youth that are age 11 see a significant decrease in their agreement scores (β = -5.808; p<.01). Female caregivers, compared to their male caregiver counterparts show significantly less agreement (β = -3.174; p<.05) - suggesting that moms possibly reflect internalizing scores that are closer to that of their child.

Model 2 of table 3.4 builds on model 1, by adding several demographic control variables. The addition of these demographic control variables do not remove the significance of any of the significant factors noted in model 1. However, we see that youth that are 10, compared to the 8 year olds show significantly lower scores (β = -2.225; p<.10). No other changes are noted in model 2.

Model 3, table 3.4 adds self-reported happiness with mother or female caregiver as a control variable. Self-reported happiness with mother or female caregiver is added separately from control variables introduced in model 2 as it is not a demographic characteristic and thus warrants the isolation of its effect. All variables that were significant in model 2, remain significant here. This relationship holds true for youth that are 10 (β = -2.211; p<.10) and youth that are age 11 (β = -6.032; p<.01). Additionally, female caregivers, compared to their male caregiver counterparts show significantly less agreement (β = -2.980; p<.10) - suggesting the robust nature of reports of mothers and female caregivers, as well as youth age.

Table 3.4: OLS Regression predicting Agreement score for Internalizing Problem Behavior

	Dependent variable:		
	Agreement - Internalizing		
	(1)	(2)	(3)
Intercept	12.623***	13.367***	13.960***
	(2.465)	(2.905)	(3.932)
Youth female	0.233	0.103	0.107
	(0.930)	(0.940)	(0.942)
Youth age 9	−0.627	−0.777	−0.792
	(1.134)	(1.142)	(1.146)
Youth age 10	−2.081	−2.225*	−2.211*
	(1.317)	(1.329)	(1.333)
Youth age 11	−5.808***	−6.050***	−6.032***
	(2.105)	(2.116)	(2.122)
Parent female	−3.174**	−3.025**	−2.980*
	(1.509)	(1.528)	(1.544)
Parent age	0.042	0.057	0.056
	(0.043)	(0.044)	(0.044)
Income below $25K		−1.039	−1.034
		(0.995)	(0.997)
High School		−0.418	−0.414
		(1.844)	(1.847)
Some College		−0.021	−0.022
		(1.733)	(1.736)
College graduate		−1.879	−1.852
		(1.974)	(1.981)
Advanced degree		−3.441	−3.413
		(2.753)	(2.760)
Off Reservation - No		−1.232	−1.238
		(1.274)	(1.277)
Happy w/mom			−0.643
			(2.867)
Observations	282	282	282
Adjusted R^2	0.032	0.030	0.026

*p<0.1; **p<0.05; ***p<0.01

Externalizing

Table 3.5 presents a similar set of analyses conducted on agreement scores for external-izing problem behavior as the models presented in table 3.4. Unlike agreements scores for internalizing, we do not see, overall, similar trends in significant factors that predict parent/caregiver and youth agreement. For instance, in table 3.5, model 1, I note that no variables significantly predicts agreement for externalizing problem behavior. This pat-tern is maintained in model 2 of table 3.5. The only covariate that is a significant predictor of agreement for externalizing problem behavior is youth self-reported happiness with their mother/female caregiver. For those that indicate they are happy with their mother or female caregiver, compared to those that are not happy with their mother or female care-giver, we see a significant reduction in agreement score of 4 points (p<.10). Although few variables rise to the level of significance here, it may be important to reflect on the in-tercept values and overall group means presented in table 3.3. The gap between internaliz-ing scores for youth and their caregivers were much larger compared to that of externaliz-ing. The initial intercept values are much smaller for table 3.5, suggesting less variance to account for in the models.

Table 3.5: OLS Regression predicting Agreement score for Externalizing Problem Behavior

	Dependent variable:		
	agree_ex_abs		
	(1)	(2)	(3)
Intercept	4.716**	5.613**	9.377***
	(1.832)	(2.175)	(2.925)
Youth female	−0.254	−0.299	−0.275
	(0.691)	(0.704)	(0.701)
Youth age 9	0.429	0.391	0.293
	(0.842)	(0.855)	(0.853)
Youth age 10	−0.001	−0.029	0.063
	(0.979)	(0.995)	(0.992)
Youth age 11	0.321	0.255	0.367
	(1.565)	(1.585)	(1.578)
Parent female	0.324	0.386	0.675
	(1.121)	(1.144)	(1.149)
Parent age	0.022	0.023	0.021
	(0.032)	(0.033)	(0.033)
Income below $25K		0.101	0.130
		(0.745)	(0.742)
High School		−1.175	−1.152
		(1.381)	(1.374)
Some College		−1.013	−1.022
		(1.298)	(1.291)
College graduate		−1.061	−0.890
		(1.478)	(1.474)
Advanced degree		−1.959	−1.783
		(2.061)	(2.053)
Off Reservation - No		0.052	0.013
		(0.954)	(0.950)
Happy w/mom			−4.081*
			(2.133)
Observations	282	282	282
Adjusted R^2	-0.018	-0.036	-0.026

*p<0.1; **p<0.05; ***p<0.01

3.7   Discussion

The purpose of this paper was to examine caregiver and youth agreement on internaliz-ing symptoms and externalizing behavior, among a sample of youth residing on or in close proximity to one of four reservations located in the Midwest of the United States that share a common language and culture. This paper approached internalizing and ex-ternalizing of Indigenous youth by exploring the parent/caregiver-child agreement on the youth's behaviors reported by the child behavior checklist (CBCL) and youth self-report (YSR) as part of the larger Achenbach System of Empirically Based Assessment (ASEBA) (Achenbach and Edelbrock, 1991). Since youth are often unable to be self-advocates for psychiatric assistance, parents and caregivers assume the role of being able to self-assess youth for problem behaviors. Given the anthropological and sociological work (Dombrowski, 2014) that indicates that Indigenous youth operate in a unique sys-tem that relies even more heavily on kin, than other European systems, it becomes vital to understand if these systems of kinship produce better or similar agreement on problem be-haviors that have been noted in the literature for other populations (Rothbaum and Weisz, 1994).

To test hypothesis 1a and 1b, that parents/caregivers will under report internalizing symptoms of their youth (1a) and parents will report similar scores of externalizing prob-lem behavior in relation to their respective youth, I employed two methods of assessment. First, correlations between the youth and caregiver scores for internalizing and external-izing were presented. Findings from the correlations produced in the study suggest that caregivers report significant positive correlation with their youth scores, respectively. The second method employed in this study provides a more in-depth view of reporting pat-terns by group by comparing group means in a t-test. The results of these tests show that internalizing scores reported by the youth are much higher than what caregivers report. Further, it was found that the group mean scores for externalizing were not significantly

different between caregivers and youth. Suggesting that caregivers, as a whole, seem to assess externalizing behaviors in a pattern that is similar to youth reporting.

To test hypothesis 1c and 1d, differences in caregiver/parent and youth disagreement will be associate with demographic characteristics (i.e., female caregiver reporters versus male caregiver reports, and household socioeconomics) and youth self-reported relationship to the parents, a multivariate regression analysis was used for each of the dependent variables. First, our findings showed that if the caregiver was a female that internalizing agreement scores between youth and caregiver would decrease, a similar finding to others in the field (Salbach-Andrae et al., 2009). However, this relationship was only present in assessing the agreement between youth and caregiver for internalizing symptoms.

Age has been an important consideration for many scholars that explore concordance of mental health reporting between caregivers and youth. Our results support related work on the role of adolescent age as a poor indicator of agreement for externalizing behavior (Cantwell et al., 1997). The results here suggest, however, that youth who are older compared to their younger counterparts have a significant decrease in disagreement between youth and caregiver. Suggesting that age for this cultural group may be an important consideration in determining concordance for internalizing symptoms. Overall the findings are mixed when it comes to age as an older meta analyses suggests age may be an important factor (Achenbach et al., 1987). Community specific and cultural specific explanations may be a promising area to help understand the age findings here.

Given prior research, one would have anticipated gender of the child to play a more significant role than what was reported here[1]. The findings have not always been consistent in terms of gender findings, but gender of youth, has historically been a significant

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[1]Interaction effects for caregiver gender and youth gender were also assessed, results were nonsignificant. Roughly 90% of caregiver reports were conducted by the female caregiver, which presents an added later of caution for their inclusion here. For more information on caregiver and youth gender interactions and a predictor of agreement, (see, Jensen et al., 1988)

predictor of agreement (Duhig et al., 2000). For some, youth males are a strong predictor of concordance between youth and caregiver (Verhulst and Van der Ende, 1992), while others have found the opposite to be true (Thurber and Osborn, 1993). Many of these studies often fail to account for the demographic characteristics of the parent, unlike this study. Suggesting that caregiver characteristics may be a more robust predictor of agreement than youth characteristics – namely, gender.

3.7.1 Limitations

Several potential limitations should be noted for this study. First, the target sample for this study is restricted to youth between the age of 8-10 and one caregiver. The tests used here are unable to account for several family dynamics that may be vital for understanding parent/caregiver agreement on problem behavior of youth. For example, the target sampling age omits other children living in the house that may be older or younger than the target child. Though this is not an uncommon limitation for investigators exploring agreement between youth and caregivers, it should be noted that the work of Van Lieshout and Boyle (2011) highlights the importance that birth order may play in both the manifestation of internalizing and externalizing, but also caregiver ability to take note of these problems. In the event were multiple children living in the home were age eligible to participate in the study the caregiver was instructed to report of behaviors on only one target child. This process was completed at random, but reduces the overall information available to assess agreement between caregiver and youth. Any reports from secondary or beyond children surveyed because they met the minimum requirements were excluded from these analyses. In cases where the youth being reported on is an only child of a family we may expect that the caregiver would report scores similar to their child's (Thurber and Osborn, 1993). Here, the eligibility requirement restricted, a) which child was interviewed in the house and b) the ability to model the temporal order of child birth order.

Lastly, while this study attempts to account for the child's happiness with parent, several problems should be noted. First, youth were asked to report feelings of relationship of their mother or female caregiver, and likewise for their father or male caregiver. Since 30% of youth in the sample indicated that they do not live with their father this relation is not accounted for in the analyses due to issues of missingness. Further, this measure of happiness assumes that the youth are reporting on their caregiver that also participated as the adult respondent to measure agreement, this assumption is not validated here. It is completely possible that the report of female caregiver happiness is someone different than the adult respondent here.

3.7.2   Implications and Future Directions

Notwithstanding these limitations, these data provide a unique insight into parent/caregiver and child agreement on valuable problem behaviors for American Indian youth, several recommendations are offered moving forward. This research establishes the need to examine similar patterns among a more diverse sample of Indigenous youth across different geographic regions, age groups, and family dynamics. No doubt, the results here are highly contingent on the developmental stage of the youth in this sample. Given the known rates of problem behaviors for American Indian youth that are slightly older than our sample in terms of suicide (Wexler et al., 2015), depression (Manson et al., 1990), and aggression (Hartshorn et al., 2012) – work should assess if similar patterns of agreement hold true for other age groups and on other domains of mental health for Indigenous populations the same as it does in other non-Indigenous samples (Achenbach et al., 1987).

The findings here suggest that parental characteristics are important factors to consider. The gender of the caregiver is an important characteristic for increasing concordance between youth and caregiver for internalizing symptoms. Here, we see that the

only predictor of agreement for externalizing behavior is youth's self-rated happiness with their parent. Suggesting that when youth do not report positive relationships with female caregivers that frequently disagree on severity of externalizing behavior.

Ivanich et al. (2018) discuss BZDDD's aim to bring the families together for interaction and learning. Signaling a possible early promise of BZDDD's family-based approach to prevention work as an appropriate intervention strategy with this population as it incorporate both youth and caregivers. This work speaks to the ongoing intervention and prevention efforts taking place for Indigenous communities. These findings suggest that efforts can be made in family-based interventions for caregivers to recognize the self-reported internalizing symptoms. That said, it should also be noted that intervention efforts moving forward may not need to spend as much time on the training of parents to identify externalizing behaviors – as they seem to report similar to their youth. Further work should assess if the program does achieve higher levels of happiness with caregivers, compared to the control group, but it is a promising sign moving forward.

Chapter 4

Sibling Influence on Behavior Problems: Test of the Actor-Partner Interdependence Model

4.1 Introduction

Scholars have a rich history of exploring adolescent outcomes taking a relational approach (Martin et al., 2013; Schaefer et al., 2011). This body of literature has been attuned to the important role of parents/caregivers (Conger et al., 1997). Not surprisingly, the role of parents, has been found to be a robust predictor of adolescent outcomes. Parent and family influence have been important predictors of a range of outcomes ranging from general well-being (Brown, 2006) to specific delinquency outcomes (Demuth and Brown, 2004; Hay et al., 2007).

The role of parents, while important, is not the single influence in the life of a youth. Just as youth spend a large amount of time with parents, youth also spend a great deal of time with their siblings. Haynie and McHugh (2003) address a reoccurring concern in the literature that sibling effects may be a product of some shared genetic "heritability" rather than modeled or other contextual factors. Their work notes that other contextual factors such as unique friendship ties are the main cause for deviance involvement (measured by prior twelve month involvement in smoking cigarettes, getting drunk, skipping school without an excuse, or having gotten into a physical fight). Further supporting their research, Low et al. (2012) find that socialization—often of older siblings on younger

siblings—is the driving factor in adolescent problem behavior. Parents and siblings do not operate in detached independent spheres. Thus it is vital to explore problem behavior among youth with sibling and parent/caregiver influences in mind.

Indigenous scholars are keenly aware of the importance of immediate family, and extended family, yet little work has explored the explicit role of primary caregiver and sibling on problem behavior. This study will extend the social convoy of Indigenous youth to encompass a second layer of actors (siblings) that likely play a vital role in predicting problem behavior. To this end, I employ an actor-partner interdependence model (APIM) to identify problem behaviors among siblings with parent/caregiver characteristics as control variables for Indigenous youth problem behaviors.

4.2   Background

4.2.1   Parental Influence

Parents and caregivers, are vital to the positive and negative outcomes of youth. The influence of parental composition, parenting style, and parent behavior modeling consistently appears to be relevant factors for early adolescence development (Garnier and Stein, 2002). For example, Bronte-Tinkew and colleagues (2006) found that the parenting style of fathers plays an important role in adolescent risk behavior. An additional mother-father correlate of important consideration is the level of engagement in criminal behavior of the parent. For example, Junger et al. (2013) use data across three generational cohorts to follow families and to examine the role of inter-generational criminality. They found that having a parent engaging in criminal behavior was a significant predictor of a child's future delinquency. When the mother is the parent engaged in criminal behavior the risk of the child's future criminality increases by a factor of five. Similarly, Sykes and Pettit

(2014) highlight the family complexities that come with our record breaking mass incarceration in this country. Specifically, the authors detail the potential psychological problems as well as material problems associated with large portions of the adult population being incarcerated. Which underscores the fact that the chance of incarceration among Indigenous males is one in three. Beyond the nuclear family, youth that are embedded in step-families also perceive their place in the family and subsequently their actions outside of the home are often based on parental dynamics (King et al., 2015). Though it has yet to be explored, the unique living situations of many Indigenous families (i.e., cousins living with cousins, youth living with grandparents, uncles and aunts living with families, etc.) may also introduce some family dynamics that help or harm youth development.

4.2.2   Sibling Influence

Sibling interactions and roles have been the center of interest for understanding youth outcomes (McHale et al., 2012). Youth do not interact with parents or caregivers in a vacuum; sibling relationships are important family dynamics and are as likely to influence decisions and attitudes as caregivers. Siblings may be influential in several meaningful ways. First, scholars have focused their efforts on understanding the role of siblings in the developmental context. Attention has also focused on the intersecting role of siblings with other social relations (e.g. parents, caregivers, friends, sibling friend). More nuanced studies have shown in recent years that gender roles and sibling order have serious impacts on behavioral outcomes. It is argued that these patterns of influence and behavior may be ubiquitous regardless of culture, race, and nation – though a brief discussion will be explored here.

Siblings play a vital role in shaping individual behaviors, attitudes, and beliefs through the life course – especially in early life development. Boer and colleagues (2013) detail

in their book the role of siblings in a wide range of developmental contexts. Their work highlights the current status of sibling research on topics such as social support, modeling behavior, social learning, and varies topics of interest for clinicians. These topics highlight ways in which siblings can have a negative and positive influence on each other. Downey and Condron's work (2004) also highlights the positive benefits siblings have on each other at early life stages. In fact, they explore the role of having a sibling in the home has on negotiating kindergarten relationships and find that youth that have siblings in the home are better adjusted and navigate social relations better than than their counterparts that do not have siblings at home.

Though studies like the ones mentioned above establish and justifiably call for more research to explore siblings influences, others have extended the role of influence to be a dynamic process between parents, siblings, and friends. It has been found that as sibling relationships improve over time and that this improvement can have a positive influence on reducing depressive symptoms, however, it has also been found that when youth perceive that they are less favored over other siblings in the household, those youth see increases externalizing problems over time (Richmond et al., 2005). To create a more complete picture of those persons who play a significant role in an individual's life, Haynie and McHugh (2003) expand the scope of influence to include friends, siblings, and shared friends. They find that although all sources independently have direct and indirect influences, unique friends appear to have the strongest influence in late adolescents. The third intersection of relationships that are theoretically and empirically important to consider are the unique triangle of influences created by parents, siblings, and friends. Ardelt and Day (2002) explore the role of this triangle of relationships on deviant behavior. Unlike 2003, they find that siblings (particularly older siblings) have the strongest impact on deviant behavior. They do note the significant role, however, for deviant peers and find varying levels of support for parental influence.

Within the sibling literature two reoccurring relationships appear to emerge as important considerations when exploring behavioral outcomes. First is the role of gender dynamics between siblings. When siblings are both female, intimacy levels between siblings have been found to be associated with higher levels of peer competence and decreased in depression symptoms. in contrast, females with a male siblings often reported more risky behaviors (i.e., alcohol use, and risky dating behavior) (Ellingson et al., 2013). In a similar line of research, Slomkowski et al. (2001) explored the role of same sex and opposite sex siblings for girls and found that siblings, in general have highly correlated deviant behavior scores, but the impact of these influences can be moderated by other sibling dynamics. The second major finding across multiple studies is impact of the sibling order on behavior. It is often the case that older siblings are found to be highly influential over their younger sibling behavior (Ardelt and Day, 2002). Additionally, Low et al. (2012) find strong direct effects for older siblings influence on younger sibling substance use. The role of gender, and sibling order are common themes in this literature and suggest that they are not often mutually exclusive and that he triangle of sibling, family, and peer dynamics are important intersecting relationships.

Related to the importance of sibling order is the consideration of developmental stages of siblings. Scholars suggest that siblings that are in close proximity in terms of developmental stages are more likely to exert some form of influence – especially on younger siblings – compared to siblings that are in developmental epochs that are very different (e.g., a 10 year old with a 19 year old sibling) (Noller and Feeney, 2013). Others have found support for within developmental epoch sibling influence (Slomkowski et al., 2001). It should be noted that studies exploring sibling influence on deviant behavior have frequently been restricted to school based samples - typically high school and occasionally middle school where youth are likely to be experimenting with risky behavior (Haynie and McHugh, 2003). Little work has explored within developmental stage influence among earlier developmental stages.

Some sibling scholars have argued that sibling influences are universally important across cultures (Whiting and Whiting, 1975). Though much of the current research has been conducted among samples that are primarily White (McHale et al., 2012) leaving this question open for debate. One notable exception is a study by Brody and colleagues (2003) where they studied siblings in rural Africa. The arguments made that siblings are important no matter the race or culture, on its face, appears to be a valid one. However, the variance of sibling infleucne between races remains an empirical question that should be explored independently within groups, and across groups.

Ardelt and Day (2002) found that youth who identified as being close to their older sibling or if youth had an older male sibling, were likely to display signs of disobedience and delinquency compared to youth that did not share a similar sibling dynamic. However, some have found that sibling interventions—even among high-risk siblings—show an overall positive delay in problem behaviors (Dishion and Stormshak, 2007). Taken together, these studies highlight the importance of sibling influence, as well as the possible fragility of sibling influences when positive buffers are in place.

4.2.3   Current Study

Recent calls in the family literature have challenged the longstanding practice of relying solely on parent influence for youth outcomes (Slomkowski et al., 2001). Important gender and age differences between siblings have been noted to contribute to youth problem behavior (Downey and Condron, 2004; Richmond et al., 2005; Samek et al., 2013) above and beyond parent influence. The social convoy model would support the inclusion of siblings as predictors of problem behavior. Unlike other sibling studies (Kim et al., 2007), however, it would be insufficient to only control for sibling influence. This study extends the sibling literature by incorporating the social convoy model which advocates introduc-

ing parent/caregiver influence to the model as well. Further, this study adds a nuance to the sibling literature by exploring sibling influence within an earlier developmental epoch than what is often explored for externalizing behaviors.

Hypothesis 2a: Problem behavior is rooted in a family context; individual externalizing behvaior will be positively associated with parent and sibling characteristics.

Hypothesis 2b: Older siblings will have more of an influence on younger sibling problem behavior than younger sibling influence on older sibling problem behavior.

Hypothesis 2c: Having older male siblings will have the greatest influence on increasing problem behavior for younger siblings—no matter the younger siblings gender.

4.3 Data and Methods

4.3.1 Data and Sample

For this study, only a subset of the baseline BZDDD data will be used. Only individuals that have a sibling interviewed for the program will be included for a dyadic data analysis. Several parent/caregiver characteristics of the sibling dyad will be also included. Preliminary data, as of March 2018, suggested that roughly one quarter of the families have two or more children in the target age range and were interviewed. The project goal was to reach 600 eligible families across our partner communities. From those 600 family contacts, we projected completing interviews with 510 families during the baseline data collection. Of these 510 families, we expected to enroll half (N= 255 families) in the 14-week prevention program (Group 1, experimental group) and the remaining half into the wait-list group (Group 2). Because of field delays and personnel issues in some of our

largest communities, we reached 463 families who provided interest forms to our program staff. Three hundred and eighty-five families who have completed their initial home recruitment visit and 304 families who completed initial baseline survey. Initial projections suggests that roughly 74 sibling dyads would be present in the data. However, when baseline surveys were complete the total number of sibling dyads in the data was 62. The primary discrepancy between the projection and actual dyads was the failure of accounting for households that had 3 or more siblings in the house that met eligibility requirements. Complete information was found among all 62 dyads, therefore all are retained for analyses.

4.3.2   Youth Measures

Dependent Variable

Youth completed the Youth Self-Report (YSR) (Achenbach and Dumenci, 2001), a standardized scales to assess internal and external problem behaviors. The YSR is frequently used in social sciences across multiple disciplines and over the past 25+ years (Bordin et al., 2013; Crijnen et al., 1999; Goodman and Scott, 1999; Ivanova et al., 2007; Perrin et al., 1991; Sourander et al., 1999). The scale was developed to assess psychopathology of youth 11-18 using 102 questions each. The YSR can be broken down into two major subscales - externalizing behavior and internalizing symptoms with an overall total problems scale when these two subscales are combined. The target age of the youth in our sample was 8-10 years old American Indian youth. For this reason, permission was granted by the Achenbach System of Empirically Based Assessment (ASEBA) to remove a total of six questions. Two questions removed focus of suicidal thoughts and attempts. Two items removed from the larger scale focused on sex and sexual thoughts. Lastly, community members and the local prevention research councils (PRC) in the com-

munity asked that questions related to *hearing things that others do not hear* and *seeing things that others do not see* be removed, as their is a history of shaming, and imprisoning members of this American Indian community for similar cultural practices. For this study, I focus all analyses on externalizing. This scale has high levels of internal validity (α = .87) and can justifiably be used in a summed score for a problem behavior sub-scale. For a complete list of questions, see Appendix A, A.1.

Independent Variables

Sex and age will be the focal dependent variables predicting problem behavior. Aggression and problem behaviors have been shown to operate significantly different depending on sex (Choy et al., 2017; Smith and Paternoster, 1987). This relation has held true for Indigenous populations as well (Sittner and Hautala, 2016). One of the most constant correlates of deviant behavior across cultures, demographic groups, cohorts, and social climate is the relationship of age on deviant behavior (Farrington, 1986; Hirschi and Gottfredson, 1983). Although, there has been a long history of controlling for age and sex due to their established significance, little work has been done to explore sex and age of siblings as predictors of problem behavior among Indigenous youth. Assuming the relationship is robust, the role that sex and age of siblings may provide valuable insights into aggressive and problem behavior for this population (Ardelt and Day, 2002).

Control Variables

For these analyses several variables are proposed to be used as control variables. Control variables include: school engagement, on/off reservation, and grade. In addition, a self-reported happiness with parent/caregiver will also be controlled for to further isolate the effects that siblings have on problem behavior. Control variables allow a researcher

to address concerns of confounding relationships (i.e., a variable that influences both the dependent variable and independent variable causing a spurious association) Control variables are able to help isolate the effects we are most interested in, as they account for variance in the dependent variable that may also be accounted for by our focal independent variable. Control variables are often not the focus, but their inclusion strengthens our understanding of our focal independent variable on our dependent variable by removing doubt that the control variables, if omitted, could have had an influence on the relationship of interest.

4.3.3 Adult Measures

Covariates

Adults are not the focus of this study, however, scholars (Carr et al., 1991; Cummings et al., 1985; Jaffee et al., 2002) highlight the vital role caregivers play in youth problem behavior. From the adult data, I use important contextual factors that may be important predictors of problem behaviors such as income, recently moving home, switching schools, parent/caregiver education, and parent/caregiver age. Income information was collected from all adult respondents by asking, "Now I have a general question about your household finances. Considering all sources, was the combined income of all persons living in your household in the past year above or below $25,000?" Response options included "above" (1), "below" (2), and "don't know/refuse" (9). To measure recent movement of household, adult respondents were asked a yes or no question: "Has your family moved to a new community during the past two years?" Parent education was assessed by asking the parent/caregiver, "What is the highest level of education you have completed?" Response options for this question were as follows: "less than high school" (1), "high school or GED" (2), "some college, vocational/technical" (3), "college graduate" (4), and

"advanced degree" (5). Lastly, parent/caregiver age information was collected by asking adult respondents, "How old are you?" This question was open ended and respondents were free to give any number to the field interviewer.

I use measures of parental engagement to explore potential moderating effects on youth problem behavior dependent on youths' age or gender. To measure parental engagement, adults were asked a series of 20 questions about their relationship with the target youth. See Appendix B, B.1 for the complete list of questions. Caregivers were asked, for each question, to determine how much they agreed or disagreed with each question on a four-point Likert scale ranging from strongly disagree (1), disagree (2), agree (3), and strongly agree (4).

4.4   Analytic Approach

To test *hypothesis 2a*, that youth problem behavior is related to parent/caregiver and sibling characteristics I will use two statistical tests. First, I will explore the correlation of child problem behavior and parent/caregiver age. Second, I will use simple univariate regression models for child behavior check list scale predicted by other sibling and parent/caregiver characteristics that are not continuous and therefore correlation tests are invalid (Fox, 1991).

To test *hypothesis 2b and 2c*, that demographic characteristics of siblings will influence sibling problem behavior after accounting for caregiver characteristics, I use a structural equation modeling (SEM) (Bollen, 1989). Specifically, I employ an actor-partner interdependence model (APIM) to examine the influence that siblings have on problem behaviors for this chapter of the dissertation. The APIM is designed to model each individuals effect on an outcome and also allows for examination of the influence each indi-

vidual has on the other member of the dyad.

4.4.1   Limits and Adequacy

Unlike traditional regression models that aim to have a Best Linear Unbiased Estimator (BLUE) (Fox, 1991) model - dyadic data present an inherent risk to a key assumptions made in Ordinary Least Sqaures (OLS) (Fitzpatrick et al., 2016). Data is assumed to be independent in traditional analytic models, however, dyadic data are sampled in settings that are intrinsically dependent (e.g., married couples, parent-child, co-workers). In this case, it is unreasonable to assume that these dyads do not share some emergent similarities in their psychology, behavior patterns, and responses (Kenny et al., 2006). In fact, this phenomenon is – in part – the impetuous for using dyadic data models. These models (e.g., APIM, HLM, SEM) account for and explore these patterns of dependence in explicit ways (Bollen, 1989; Rabe-Hesketh and Skrondal, 2008; Raudenbush and Bryk, 2002).

An additional assumption that is added to structural equation models that are not often of concern in traditional multiple regression or ANOVA analysis is *directionality*. The assumption of directionality is a concern and focus of SEM models because SEM models are often employed to identify either causal relationships or measurement models. In both cases, the direction and specified relationships are of critical importance. This assumption, unlike many of the OLS assumptions is a theoretical assumption which placed burden on the investigator to justify measurements or causal relations founded in literature as models can otherwise remain unchecked (Kline, 2012).

Since SEMS focus so heavily on directionality and aim to uncover causal relations, SEM models often assume that endogenous variable to be uncorrelated. If shared variance was thought to be present between on or more variables, models would explicitly model this shared variance by regressing or correlating variables and/or their error terms.

Similarly, SEM models are often presented in terms of *recursive* or *non-recursive* models. Specifically, models that do not have feedback loops or models processes that inform to and from a set of variables are considered recursive. Alternatively, models that do have modeled feedback loops are considered non-recursive.

Another core assumption of SEMs, as they have the ability to model latent constructs is the notion that all exogenous variables are assumed to be measured without error. For base SEM, one would assume that endogenous variables are measured as continuous measures. Though this assumptions can, like OLS, be violated in specific model specifications/estimators are used to account for non-normal distributions (Little, 2013).

To accurately test the proposed model, a large number of cases from the overall sample must be dropped. As explained in the prior section, the APIM requires that the same information is known for related dyads. Therefore, individuals that did not have a sibling and also took the survey would have no partner effects to model. Many SEM techniques, including the APIM often rely on sample sizes that exceed what is typically associated with OLS and other regression techniques. However, Olsen and Kenny (2006) suggests that for the minimum number of cases, the number of dyads plus one must be twice as great as the number of variables in the model. Given the number of dyads in this study (62), the sample size should be sufficiently large enough to run these models. Further support can be found in a recent simulation study that suggests that when singletons (i.e., data from one member of a dyad are available with data from the other member is missing) are not present or very low, 30 dyads are needed to ensure satisfactory convergence rates (Du and Wang, 2016).

One additional limit to using an APIM is the problem of undistinguished dyads. In cases where dyads are easily distinguished (e.g., mother-child dyad) SEM is a perfectly acceptable model. However, in cases where actors are thought to be indistinguishable (i.e., no clear differentiating characteristic) the model becomes much more complex

(Gonzalez and Griffin, 1999). To address this concern, I take siblings that may seem indistinguishable and separating all "actors" and "partner" of the dyad by sibling order. All actors will be the youngest sibling of the dyad and older siblings will assume the role of the partners in the APIM. Distinguishing the two individuals on this level makes the model easier to fit (Kenny et al., 2006), and will be a valuable insight into problem behavior—as older siblings are thought to socialize younger siblings into problem behaviors.

4.5   Interpretation

4.5.1   Correlations and Regression Analysis

The tests and underlying process for the correlation tests and the regression analysis rely on the same assumptions and restraints that are discussed in sections 3.5.1 and 3.5.3. As they apply to this chapter, however, I would interpret significant correlations ($p < 0.05$) to indicate the linear relationship between problem behavior and age of child and age of adult.

The regression analysis for *hypothesis 2a* would establish base line directionality, significance, and effect size prior to running the APIM. The assumptions listed in section 3.4.1 will be explored and validated prior to reporting of results to ensure that the models have an unbiased results.

4.5.2 Actor Partner Interdependence Model

Figure 4.1 is presented as simple example of the APIM. In the model we note that two people are present and two variables are present. X_1 and X_2 are the same variable but for person one and person two. Likewise, Y_1 and Y_2 is one variable, but with the unique scores for person one and person two. The model assumes that the X_i variables are exogenous to the Y_i variables. The paths from X_1 to Y_1 are marked with an 'a', as these are referred to as actor effects, or the effect the actor has on ones own outcome. The same is true for X_2 to Y_2. The path from X_1 to Y_2 is marked with a 'p', as this is referred to as a partner effect. Again, the same holds true of the path from X_2 to Y_1. The correlation between the error terms (noted in Figure 4.1 as E_1 and E_2) is to account for residual nonidenpendence in the outcomes (Y_i's) which is not explained by the APIM (Kenny et al., 2006).

Figure 4.1: Actor-Partner Interdependence Model
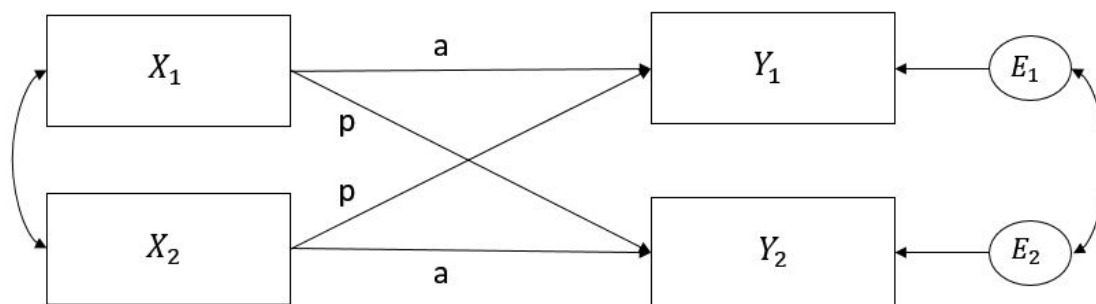
Using the APIM extends the social convoy to include siblings for Indigenous youth while accounting for parent/caregiver covariates in the model. The use of the APIM model in a structural equation approach provides flexibility to do group based analysis and also include latent constructs to the model if needed (Little, 2013).

4.6   Results

4.6.1   Univariate results

Table 4.1 presents descriptive information for the variables used in the base actor partner interdependence model for this study. Since dyads are distinguished by sibling order, the table provides the descriptive statistics by dyad role. Older siblings of each dyad have an even split on gender, 50% male and female. Individuals in the dyads that are the younger sibling have slightly more females than males (54%). The main outcome of interest for this study is externalizing behavior. As such, the descriptive information is provided in table 4.1. The average score for older siblings is 8.21 while the average score for younger siblings was slightly lower at 8.00. Individuals could have scored as low as 0, but as high as 30 on this measure. The average age of older siblings of each dyad is 9.76 years old whereas the average age of younger siblings was 8.56 years old. Lastly, self-reported happiness with their female caregiver or mother is reported by role. Older siblings report an average score of 3.61 on a 1–5 scale. Younger siblings reported slightly lower average score of 3.40.

Table 4.1: Descriptive statistics–based on dyad role

Variable	Role	Mean	SD	Min.	Max	N
Externalizing	Older Sibling	8.21	7.10	0	30	62
	Younger Sibling	8.00	6.23	0	30	62
Gender (1 = Female)	Older Sibling	0.50	0.50	0	1	62
	Younger Sibling	0.54	0.50	0	1	62
Age	Older Sibling	9.76	0.72	8	12	62
	Younger Sibling	8.56	0.80	7	11	62
Happiness w/Female Caregiver	Older Sibling	3.61	0.91	1	5	62
	Younger Sibling	3.40	1.20	1	5	62

Table 4.2 presents the descriptive statistics of variables that do not vary by role. For instance, 46% of the youth dyayds lived in households with a annual income less that

$25,000 a year. An overwhelming majority of the families (88%) reported living on reservation land. The average age for caregivers in this study was 41.05 years old – ranging from 22-66. Table 4.2 presents the adult education level of caregivers surveyed. Approximately one-third of caregivers reported their highest level of education to be high school or lower. Roughly half (49%) of the sample reported having had some college or vocational training, and 19% of the sample reported having college degrees or advanced degrees.

Table 4.2: Descriptives Statistics - Household/caregiver Factors

Statistic	Mean	St. Dev.	Min	Max
Income < $25k	0.46	0.50	0	1
Live On Reservation	0.88	0.32	0	1
Adult Age	41.05	11.23	22	66
Adult Education				
High School or Less	0.32	-	-	-
Some College or Vocational	0.49	-	-	-
College Graduate or Advance Degree	0.19	-	-	-

4.6.2 Bivariate Results

Due to the varying distributions of variables in this paper, several tests were conducted. Below you will find the results of correlation results run for each continuous measure by dyad, t-test results, chi-square results for categorical differences, and ANOVA results for variables with more than two categories.

Correlations

Table 4.3 presents the results of correlations between all continuous measures for this study for older siblings. In total, we see that the only significant relationship noted in table 4.3 is the relationship between externalizing score and youth self-reported happiness

with their female caregiver or mother (ρ = -0.27, p<.05). As youth report higher levels of happiness with their female caregiver, they have a modest decrease in externalizing score.

Table 4.3: Correlations Among Older Siblings

	1	2	3
Externalizing (1)			
Older Sibling Age (2)	-0.06		
Caregiver Age (3)	0.18	-0.09	
Older Sibling Happiness w/mom (4)	-0.27*	0.16	-0.03

*p<0.05

Table 4.4 presents the results of the same set of analyses presented in table 4.3, for the younger siblings. Here we see a similar pattern of behavior for the younger siblings compared to their older sibling counterparts. When higher levels of self-reported happiness with their female caregiver or mom a significant decrease in externalizing scores are associated (ρ = -0.29, p<.05). All other associations assessed in the correlation matrix are non-significant.

Table 4.4: Correlations Among Younger Siblings

	1	2	3
Externalizing (1)			
Younger Sibling Age (2)	0.11		
Caregiver Age (3)	-0.02	0.06	
Younger Sibling Happiness w/mom (4)	-0.29*	-0.04	0.19

*p<0.05

t−tests

To assess differences between the dyads t-tests were conducted for differences in age, externalizing scores, and self-reported happiness with mom. Siblings distinguished as being an older sibling compared to those that were distinguished as being a younger sibling within each dyad we systematically older than than their counterparts, t= 8.73, p < .000. However, all other factors were not significant. Externalizing scores showed no significant

difference, t= 0.17, p = 0.861. Similarly, no significant difference was noted for happiness with female caregiver by dyad membership, t= 1.09, p = 0.278.

Chi-Square

A chi-square test of independence was performed to examine the relation between gender of older siblings and gender among younger siblings. The relation between these variables was non-significant, X-squared = 0.065, df = 1, p-value = 0.799. Suggesting that non significant differences in gender distribution was found for the dyad type.

ANOVA

To explore the association between parent education and externalizing problem behavior, two analysis of variance (ANOVA) tests were conducted. The first was the relationship of parental education on externalizing problem behavior for older siblings. The mean externalizing problem behavior scores for older siblings were 6.5 for youth with parents that had a high school education level or less, 7.67 for older siblings that had a parent that had some college or vocational training, and a score of 13.27 for youth with parents that have a college degree or an advanced degree. The ANOVA results indicate that education among the older siblings was significant F = 3.20, p = 0.0495. This relationship did not hold true for younger siblings, F = 1.38, p = 0.262. The average externalizing problem behavior scores for younger siblings was 8.0 for youth with parents that had a high school education level or less, 9.55 for younger siblings that had a parent that had some college or vocational training, and a score of 5.91 for youth with parents that have a college degree or an advanced degree.

4.6.3 Actor Partner Interdependence Model

The focus of this study is the investigation of the effect of siblings on externalizing behavior. The dyad members are treated as if they are distinguishable by sibling order. The two roles used for each dyad are: older siblings and younger siblings. Both the effect of own gender (female) (actor) and the effect of partner's gender (female) (partner) on one's own externalizing behavior are studied. The total number of dyads (N) is 62 and there are no missing data. Residuals of the fitted model that are more extreme than 4 standard deviations (absolute value) are considered outliers. Here, no outliers were detected.

The analyses for this chapter use structural equation modeling. More specifically, I use an actor parter interdependence model. Analyses were conducted in R, using the Lavaan package (Rosseel, 2012) and a web-based application (Stas et al., 2018). The tests of coefficients are Z tests. Effect sizes for actor and partner effects are partial correlations. Betas are given twice, one using the overall standard deviation across all persons for standardization and a second using the standard deviation for older siblings and younger siblings separately. If betas are to be compared across members, the beta value should be examined. For all these analyses, alpha is set at 0.05. The descriptive statistics of the raw variables are contained in Table 1 and the FIML estimated means and standard deviations in Table 2 in the output tab 'Tables'. If there are no missing data, the raw and the FIML means should be the same: the FIML standard deviations differ from the raw ones by the square root of N - 1 divided by N.

The model converged after 61 iterations. A summary of results of the APIM analyses is contained in Table 4.5. The variance of the errors for the older siblings and younger siblings are 43.20 and 37.97, respectively. The R squared for the older siblings is 0.130, and for the younger siblings it is 0.004. Figure 4.2 is a visual depiction of the model. For simplicity only regression coefficients and correlations are noted in the figure. A detailed

account of the model follows.

Figure 4.2: APIM - Gender (female) predicting externalizing problem behavior for distinguished dyads by sibling order
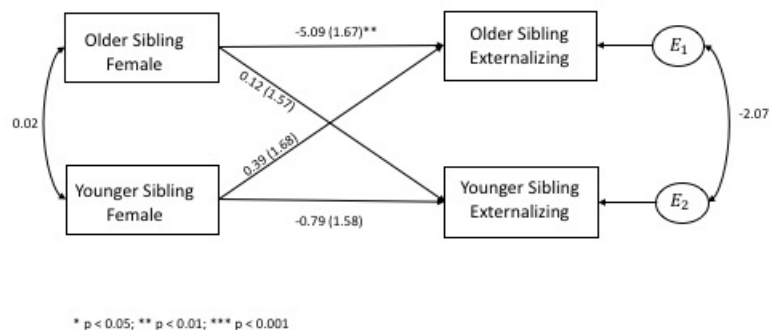
The intercept (the predicted score on externalizing behavior when the variables of gender equal zero (male)) for older siblings is equal to 10.54 and is statistically significant ($p < 0.000$, 95% CI [7.67, 13.41]) different from zero. The intercept for younger siblings is equal to 8.38 and is statistically significant ($p < 0.000$, 95% CI [5.68, 11.07]) different from zero. The difference in intercepts is equal to 2.167, this difference is not statistically significant ($p = 0.293$, 95% CI [-1.87, 6.20]), which means that there is no main effect of sibling order.

The actor effect for female older siblings compared to male older siblings is equal to -5.09 ($p = 0.002$, 95% CI [-8.37, -1.81]). The actor effect for the younger siblings is equal to 0.79 ($p = 0.617$, 95% CI [-3.88, 2.30]). When tested if the two actor effects are equal, the difference was found to be marginally significant, $p = 0.061$, 95% CI [-8.80, 0.20]. The overall actor effect is equal to -2.94 and is statistically significant ($p = 0.011$, 95% CI

Table 4.5: APIM Results Assuming Different Actor and Partner Effects for Both
Roles

Effect	Role	Estimate	Lower 95% CI	Upper 95% CI	p value	R Squared
Intercept	Older Sibling	10.54***	7.67	13.41	0.000	0.130
Actor		-5.09**	-8.37	-1.81	0.002	
Partner		0.12	-2.96	3.19	0.941	
Intercept	Younger Sibling	8.38***	5.68	11.07	0.000	0.004
Actor		0.79	-3.88	2.30	0.617	
Partner		0.39	-2.91	3.68	0.817	

*p<0.05; **p<0.01; ***p<0.001

[-5.16, -0.68]).

The partner effect from younger siblings to older siblings is equal to 0.39, which
is not statistically significant (p = 0.817, 95% CI [-2.91, 3.68]). The partner effect from
older siblings to younger siblings is equal to 0.12 and is not statistically significant (p =
0.941, 95% CI [-2.96, 3.19]). When tested if the two partner effects are equal, the differ-
ence was found not to be statistically significant (p = 0.905, 95% CI [-4.23, 4.77]). The
overall partner effect is equal to 0.252 is not statistically significant (p = 0.827, 95% CI
[-2.01, 2.51]).

4.7 Discussion

The aim of this paper was to examine the role of sibling influence on problem behavior
within a sample of 8-10 year old American Indian sibling dyads. It is no surprise that
scholars have repeatedly found support for the importance of family members on problem
behaviors among youth (Ardelt and Day, 2002; Haynie and McHugh, 2003; Low et al.,
2012; Slomkowski et al., 2001). Investigators who aim to understand problem behaviors
among Indigenous communities have likewise found family to be a vital factor in youth
problem behavior (LaFromboise et al., 2006). The majority of the work done among In-
digenous communities to explore problem behaviors, however, has often focused on the

role of parents and caregivers. Few, if any, have attempted to explore problem behavior from a sibling influence perspective. This omission in the literature is surprising considering the value that Indigenous communities place on kinship (Waldman and Braun, 2009). To address this gap in the literature this study used the Achenbach/ASEBA Child Behavior Checklist to measure externalizing problem behavior among a subset of youth that were identified as having a sibling that also participated.

To assess hypothesis 2a, that problem behavior is rooted in a family context that included caregivers and siblings several tests were conducted. First, bivariate analyses were conducted to explore the associations between youth externalizing behavior and their age, caregivers age and happiness with their female caregiver or mom. The correlation results suggest that only happiness with female caregiver or mother was significantly associated with externalizing. Additionally, an analysis of variance tests were conducted to explore the association between parent education level and externalizing behavior for older sibling and younger siblings. Here, I found that older siblings showed a significant difference in externalizing problem scores, yet this did not hold true for younger siblings. Multivariate analysis were unable to control for parent/caregiver effects as originally proposed due to limited sample size.

Brody and colleaggues (1994) suggests that older siblings are more influential on younger sibling behavior than the reverse. This is tested in hypothesis 2b. It is further argued that gender is an important factor to consider in influence models (McHale et al., 2012). For example, Ellingson and Slutske (2013) found that when older siblings are males, they have the greatest influence on younger siblings–regardless of younger sibling gender. This argument is tested in the present study under hypothesis 2c. To explore the role of sibling influence an APIM was used in this study. Specifically, the role of older sibling gender on their own problem behavior as well as their influence on their younger sibling problem behavior outcome and vice versa. Hypothesis 2b could not be confirmed

here. Partner influence from older siblings on younger sibling was non-significant as was the influence of younger sibling on older sibling problem behavior. Moreover, hypothesis 2c was also not confirmed here.

4.7.1   Limitations

The present study applies a unique approach to explore problem behavior among Indigenous siblings, but is not without limitations. Using and APIM model provides nuanced insights into the role of individual characteristics play on outcomes, but also allows for an examination for how those same characteristics influence outcomes of their distinguished dyad partner. The sample size for this study was extremely limited. The small number of sibling dyads that were captured in this sample only allowed me to include one variable into the model without jeopardizing model fit. Bivaraite analyses (4.3 and 4.4) suggest that self-reported happiness with female caregiver or mother showed a significant negative association with externalizing problem behavior. Thus, a more robust APIM model would have included this variable as an important control variable. Instead this study relies heavily on bivariate results.

The bivariate results indicate a significant age difference by dyad role (i.e., older siblings and younger sibling) which adds support to the distinction of the two. It is likely, however, that the compressed age eligibility requirements of the prevention program reduces some potential sibling dynamics that have been missed here. Meaning, to participate in the study youth were required to be within the age range of 8-10. It is often the case that youth included in the overall sample and youth included in the subset of dyadic data have other younger and older siblings with broader age gaps. More complete data on all household siblings may have produced more meaningful differences between sibling influences on externalizing problem behavior.

Sibling ordering, as presented in this chapter should be approached with caution. The choice to use and APIM brought a series of benefits, but also forced practical restraints that should be considered. To distinguish dyads in this chapter, dyads were separated by sibling order (i.e., older vs younger sibling). Related to the point made earlier regarding the eligibility of youth extends a limitation the modeling and interpretation here. Since it is the case that youth were only eligible within a compressed age range, it is unfair to assume that the "older" youth and "younger" youth within each dyad are, in fact, the oldest or the youngest in the house. Yet, these models are interpreted as if the older sibling will have some strong influence or vice versa, but this is hard to say without accounting for true sibling order.

Externalizing behavior, as it is currently operationalized (i.e., rule breaking and aggressive behavior), may be highly depended on the developmental stage – as other have shown (Moffitt, 1993). Caution should be exercised when interpreting the results of this study. The sample in the present study is younger than most studies as this age group typically exhibits fewer rule breaking and aggressive behavior compared to older adolescents. Furthermore, dyads in this study were distinguished by sibling order. Thus younger siblings within and already younger-than-typical sample were examined for an outcome that is has a heavily right-skewed distribution. It is likely that no significant findings were found for partner influence and actor influence as these youth are not at the correct stage for such behavior.

4.7.2   Implications and Future Directions

The use of Actor-partner interdependence models allow researchers to explore unique questions that account for dependencies between actors. A limited use of APIM is presented here, but other scholars should continue to peruse similar lines of research. Often,

APIMs are used within the family literature, but typically among co-parents. Here the use of APIM is extended to siblings. Sibling research, especially within Indigenous communities where dependencies may be more likely to occur, is a much needed area of focus to understand valuable health and behavioral outcomes.

To successfully test influence models at the sibling level, future research will need to explicitly seek out this form of data collection. This study uses data available to implement and APIM, but it was not the original intent of this data to be structured and tested in this way - thus my small sample. With minimal effort, data could be collected among siblings - even if they are not the target prevention audience for the overall study. Increasing the sample size of dyads in future research would enable researches to explore more complex and complete models of influence.

Similarly to the point made above, it would be beneficial for future researchers to expand the age range of siblings eligible for data collection. Boer et al. (2013) has previously shown in a non-Indigenous study that the large the age gap the more influence siblings are to have on younger siblings. Indigenous communities are often geographically isolated, tight-knight communities that inherently expand the age gap between friends and family. It is not uncommon for Indigenous youth to spend a great deal of time with older siblings and cousins compared to mainstream White communities in America. If this is the case, it is vital to capture this expansive age gap between friends and family as likely influencers of behavior.

Increasing sample size and age gaps may help analytically, but the rare occurrence of problem behavior may warrant special studies design and recruitment. To really explore problem behaviors among Indigenous populations as a relational dyadic level, it may be necessary to target youth that have been identified by teachers, school administrators, community members, family, legal system to have a history of problem behavior. Capturing a smaller sub-sample of youth that all have been identified as having problem

behavior histories may allow researchers to explore other nuances of problem behavior and unique forms of influence that is not captures in a sampling frame such as this study.

Chapter 5

Personal and Family Social Convoys to Explore Adolescent Problem Behavior

5.1 Introduction

The use of social network analysis (SNA) to explore youth behavior as a research tool has been extremely beneficial to investigators in the recent decades. As youth age into adolescence, their reliance on their parents for modeled behavior begins to wane and their reliance on similar-aged peers increases (Brechwald and Prinstein, 2011). Building on Chapter 4, this chapter extends the social convoy beyond family to include friends, school peers, and acquaintances to broaden the social contexts in which adolescents consume, mimic, and model behavior. It has been argued that all of these relations are important social relations to consider when exploring behavioral outcomes (Bearman et al., 2004; Schaefer et al., 2013). While social relations have the potential to reinforce positive behavior (Rice, 2010), they are also likely to have a negative influence (i.e., substance use, gang membership/participation, risky sexual behavior).

SNA has proven to be useful tool in exploring physical health outcomes (Berkman and Glass, 2000a; Friedman and Aral, 2001; Pescosolido and Levy, 2002; Smith and Christakis, 2008), mental health outcomes (Valente, 2010), and behavioral outcomes (Valente and Pumpuang, 2007). The applications of SNA has an impressive scope for different age groups, both adults (Siciliano, 2017) and adolescents (Cheadle et al., 2013; McPherson et al., 2001; Valente et al., 2005; Weerman, 2011). The promise of SNA has

extended beyond large scale national surveys (Kadushin, 2012; Smith and Moody, 2013) and have been used for hard-to-reach and culturally diverse samples as well (Eddens et al., 2017; Dombrowski et al., 2013a, 2014). In sum, the use of SNA in social science research is robust and expansive.

This study aims to address a gap noted in the literature. Indigenous scholars are keenly aware of the importance of immediate family, extended family, and community for Indigenous youth (Dombrowski et al., 2013b; Waldman and Braun, 2009; Walters and Simoni, 2002), yet little work has explored the explicit role of social networks among this population. This study will take a social networks approach to extend the social convoy model to a completely extended social convoy of Indigenous youth to explore problem behaviors. To this end, I explore social convoy size among Indiegnous youth personal networks as a predictor of problem behavior and the potential moderating role of being structural characteristics of their networks (namely, having explicitly nominated a caregiver).

5.2   Background

As this study relies heavily on a relational perspective, the following sections provide background on several domains of relational literature that are relevant to this study. Included is the use of social convoys to explain problem behaviors. Additionally, I introduce how social network scholars have explored problem behaviors in a similar, yet distinct approach to the social convoy model. The role of social support in buffering or preventing problem behaviors is also detailed below. Lastly, I present some literature on self-mastery. This last point is offered as an important control for understanding problem behavior.

5.2.1   Social Convoys and Problem Behaviors

The social convoy model (Antonucci and Akiyama, 1987) has been widely used in the aging literature and child development literature (Sherman et al., 2015). Although the social convoy has not been as popular for explaining problem behaviors among youth, it would be an improper characterization to suggest that it has had no impact on this area of research. For example, scholars have used the social convoy model to help explain mental health support (van den Berk-Clark et al., 2017). The work of Levitt et al. (1993) highlights the role of social convoys as a buffer for adolescent self-concept and sociability across ethnic groups. Levitt built on previous work by using these different roles in a youths' convoy to understand school achievement (Levitt et al., 1995). The social convoy model relies heavily on the assumption that all forms of connections equally and positively buoy an individual up to be more resilient to adverse experiences (Berkman and Glass, 2000b). This assumptions has been tested and explored at length by scholars doing social network analysis broadly (Butts, 2009; Valente et al., 2007).

5.2.2   Social Networks and Problem Behaviors

Social network analysis has been a fruitful method for extending our knowledge of problem behaviors, particularly among adolescents. As of 2011, Brechwald and Prinstein , had synthesized the social network literature as it relates to adolescent peer influence—one major outcome being the peer influence on problem behavior. Problem behaviors explored using a social network approach are expansive and continue to grow. Here, a narrow review of the literature will focus on adolescent problem behaviors in terms of delinquent or deviant behavior.

The use of social network analysis has been a useful tool for exploring adolescent substance use. An important question for scholars in this line of research centers on the

temporal ordering of events. That is, do youth make friends that engage in under-age drinking, cigarette smoking, and use of other illicit drugs which then influences youth (social learning) or do youth begin engaging in these behaviors and then select friends based on similar behavior patterns (homophily). Schaefer (2016) explores this topic using longitudinal social network analysis, or stochastic actor-oriented models (Snijders et al., 2010), in an attempt to uncover the causal patterns of substance use and friendship formation. The results suggest adolescents do select friends that engage in substance use activities, but that exogenous factors account for selection (homophily), not substance use. Others in this debate have found that while selection is important, social influence cannot be ignored in terms of initiation of drug and alcohol use (Hoffman et al., 2006; La-Haye et al., 2013). Likewise, positionality of an adolescent in the social network plays a significant role in risky behaviors such as early cigarette smoking. Alexander et al. (2001) found that youth in school networks that interacted more with the 'popular' students were more likely to be current cigarette smokers and having their 'best friends' smoke was another significant predictor of youth smoking.

Adolescent sexual behavior is another area of focus that has utilized social network analysis to explore unanswered questions in the field. While a sizable portion of the literature has focused on diffusion of sexually transmitted diseases (Rice et al., 2010; Romer et al., 1994), instead I focus my attention on early onset and friendship formation based on sexual activities. Bearman et al. (2004) find unique sexual partner patterns emerge among high school students that help shape how selection of sexual partners is a restricted phenomenon given social pressures to avoid particular sexual partner ties. That is, they find that in virtually all cases, no youth nominates sexual partners that are their former sexual partner's ex's former sexual partner—these relations are thought to be forbidden ties and shape social interactions among high school youth. Apart from friendship formation, others have found that romantic partners of adolescents have important impact on other risky behaviors if those formations happen too soon or with other risky partners

(Kreager and Haynie, 2011).

These findings highlight the benefit of taking a relational/social network approach to understanding adolescent problem behaviors. Allen and colleagues (2005) find youth social networks to be influential in deviant behavior choices beyond what has been discussed above. Social network analysis have helped explore the role of friendship and depression (La Greca and Harrison, 2005), suicide (Bearman and Moody, 2004), and other mental health illnesses (Cotterell, 2013). Additionally, through a relational perspective, scholars have explored gang involvement (Fleisher and Krienert, 2004), and other formal criminal justice delinquent acts (Calvó-Armengol and Zenou, 2004).

5.2.3   Social Networks among Indigenous Populations

Given the promise of social network analysis in mainstream social science research, it is surprising that social network analysis has not found the same stronghold in the extant literature of Indigenous populations. At the time of writing this dissertation, to my understanding, no social network studies have been published among Indigenous youth. However, several social network studies have been conducted among Indigenous adults (Dombrowski et al., 2013a,b, 2014; Ready, 2018; Ready and Power, 2017). To date, all of the social network analysis has focused on arctic Indigenous population, leaving little empirical understanding of American Indian and Alaska Native social networks. The prior social network research indicates that in rural communities where kinship and community are central to that group, relationships and network systems in place are critically important for things like food sharing, employment, and income. Social network analysis is a promising methodological approach to understanding how culturally complex and isolated communities interact in ways that are consistent and inconsistent with western scientific approaches.

5.2.4   Social Support

Years of research substantiate the interplay between social support and behavioral outcomes. For instance, adolescents that have high levels of social support tend to have less problems with depression and suicide (Yang and Clum, 1994). Researchers that have targeted at-risk youth for social support interventions have shown that building individual social support is possible—even in on-line delivery formats (Barrera et al., 2002). However, Hogan and colleagues (2002) argue that more work, specifically randomized control trials of social support interventions, should be conducted for a rigorous evaluation of these interventions. Notwithstanding these limitations, researchers have reported that increasing social support among youth is related to reducing smoking (May and West, 2000), improved academic performance (DeGarmo and Martinez, 2006), and improved self-esteem and coping (Smoll et al., 1993; Unger et al., 1998).

The use of social networks analysis has previously been used to examine social support (Cochran and Brassard, 1979; Hall and Wellman, 1985). For example, McPherson and colleagues (2001) provide an in depth overview of the literature of homophily, suggesting that individuals seek friends and relations that are often similar to provide a web of connections for social support. In addition to their review of homphily and social support, Berkman and Glass have outlined a broader review of the concepts and empirical work to date on social networks and social support literature (2000a). They outline the early findings of social network studies that consistently found that larger networks seems to have positive impact on physical health and mental health. These authors highlight the advancements in social network approaches to contextualize social support at the individual level and the contextual level.

The popularity of social support extends to Indigenous populations. Social support is thought to be a strong indicator of resiliency for Indigenous populations (Stumblingbear-

Riddle and Romans, 2012). For example, increased social support has been linked to better academic performance among Indigenous undergraduate students (Gloria and Robinson Kurpius, 2001). Additionally, Oetzel et al. (2007) found that social support is an important correlate of alcohol, drug, and mental disorders. One limitation to this body of work is that it has seemed to focus more on adult female populations (see, Chong and Lopez, 2005; Hodge et al., 1996), leaving more to be understood for youth Indigenous populations and social support.

5.2.5 Self-Mastery

While the inclusion of self-mastery does not have a formal place in the typical relational framework, it presents a unique competing hypothesis to understand problem behavior. Particularly because self-mastery is thought to buffer the negative social contextual factors like poverty, poor schooling, and absent parents to improve outcomes for youth (Pearlin and Schooler, 1978; Pearlin et al., 1981). Caputo (2003) found that self-mastery was associated with improved physical health among at-risk youth. Similarly, Lipschitz-Elhawi and Itzhaky (2005) found that youth with higher levels of self-mastery were better adjusted to external social interactions. Others have moved toward a practice of combining self-mastery (coping through personal agency) and communal mastery (social process of coping) for multicultural youth (Fok et al., 2012). They found that this new approach to be beneficial for looking at suicidal ideation among Alaska Native youth (Philip et al., 2016). In summary, self-mastery can be a powerful form of resiliency for youth against conditions that are often beyond their control.

5.2.6   Current Study

What is not found in the extant social network literature exploring social support and mastery is a focus on Indigenous youth. Given the intense focus of Indigenous prevention/intervention researchers to increase the quality and the quantity of connections for Indigenous youth, exploring these relations is vital to identify specific roles, network size, and other network measures for targeted intervention efforts to increase social support and mastery and decrease problem behaviors. Thus, the purpose of this chapter is aimed at exploring the role of social convoys as social networks of Indigenous youth to explore social support, mastery, and problem behaviors given specific roles, social network compositional differences, and network structure measures.

> Hypothesis 3a: Youth with larger social convoys will have lower levels of problem behavior.

> Hypothesis 3b: Youth with a network tie to their caregiver will have lower levels of problem behavior.

> Hypothesis 3c: Youth with a network tie to their caregiver and larger networks will have lower levels of problem behavior compared to youth that do not have a network tie with their caregiver and small network size.

5.3   Data and Methods

5.3.1   Data and Sample

Unlike the previous chapters where the questions and modeling techniques required some form of paired relationship, this chapter focuses on all youth in the sample. Each youth

is believed to be nested within a social convoy, yet these convoys were not impeded by study design or recruitment strategy making all 375 youth in the overall sample eligible. From the 375 eligible youth in the sample, a listwise deletion of 29 cases were excluded due to missingness. Having the same cases across all models and descriptives provides uniformity across all modeling and more confidence in our model comparisons.

5.3.2 Dependent Variable

Problem Behavior

Youth completed the Youth Self-Report (YSR) (Achenbach and Dumenci, 2001), a standardized scales to assess internal and external problem behaviors. The YSR is frequently used in social sciences across multiple disciplines and over the past 25+ years (Bordin et al., 2013; Crijnen et al., 1999; Goodman and Scott, 1999; Ivanova et al., 2007; Perrin et al., 1991; Sourander et al., 1999). The scale was developed to assess psychopathology of youth 11-18 using 102 questions each. The YSR can be broken down into two major subscales - externalizing and internalizing behaviors, with an overall total problems scale when these two subscales are combined. The target age of the youth in our sample was 8-10 years old American Indian youth. For this reason, permission was granted by the Achenbach System of Empirically Based Assessment (ASEBA) to remove a total of six questions. Two questions removed focus of suicidal thoughts and attempts. Two items removed from the larger scale focused on sex and sexual thoughts. Lastly, community members and the local prevention research councils (PRC) in the community asked that questions related to *hearing things that others do not hear* and *seeing things that others do not see* be removed, as their is a history of shaming and imprisoning members of this American Indian community for similar cultural practices. This scale has high levels of internal validity ($\alpha = .80$) and can justifiably be used in a summed score for a problem

behavior sub-scale. For a complete list of questions, see Appendix A, A.1.

5.3.3 Moderating Variables

Social Network Measures

To operationalize social convoys, I break from the approach presented by Antonnuci (1986) and approach convoys in a way that is informed by modern SNA. This approach captures the multiple layers of relations that are so heavily stressed by Antonucci et al. (2013) while providing data that can be used in other application outside of the social convoy model. Respondents were given an independently created name generator to assess friendship connections. The youth and adult respondents received the following prompt,

> Can you tell me the first and last initials of up to nine people you consider to be your best friends? You can include family members too. Please list your best or closest friend first.

No prompts were provided to force individuals to nominate anyone if they did not want to provide initials for anyone. The number of individuals or alters that are provided by the respondent is their measure of their *degree*. After the respondents provided up to nine of their best friends they were asked a series of questions about each individual or *name interpreter* questions. The name interpreter questions asked respondents about the alters relationship to the ego (i.e., family, friend, etc.), age of the alter, gender of the alter, if the alter is Native, if the alter lives within walking or biking distance, and if the person attends their school.

For the purposes of this study, I created networks for each youth that also includes the parent/caregivers personal network, even if the parent/caregiver is not explicitly nomi-

nated by the youth. These networks have been referred to as *duocentric networks* (Kennedy et al., 2015). Egocentric networks or personal networks are often restricted to the ego's nominations. Unlike egocentric networks, duocentric networks, popularized in the family/spousal literature, provides a larger picture of the structure, resources, and relationships present in the ego's life. It is argued that these extended networks shed light on the transmission of social capital that egocentric networks are unable to capture (Coleman, 1988). Further, attaching the parent/caregiver personal network to the youth's network to extend the adolescent's ecological network to conceptually include family, close friends, family friends, and acquaintances—thus extending to a *full* social convoy. From this extended personal network of the youth, measures will be computed of their number of network components and network size (Wasserman and Faust, 1994). Given the inherent structure of a duocentric network, if a youth's network is found to be one network component, they have nominated their parent - thus allowing us to explore the relationship of explicitly nominating a caregiver in the network compared to youth that do not explicitly nominate a caregiver. Examples of duocentric networks are found in figure 5.1. In figure 5.1a it is seen that the ego's network (top) included two individuals that were not found to be a caregiver, thus the bottom component of figure 5.1a is the caregivers network and four nominated individuals. Figure 5.1b shows an example of a case in which the youth explicitly nominated a caregiver in the network as well as other individuals. Youth that display a connection to their cargiver like the one noted in figure 5.1b receive a 1 on the `connected` measure where the youth in figure 5.1a would receive a 0 for the same measure.

Control Variables

The work of Vaux (1985) established the need to explore the nuance of age, gender, ethnic differences in social support. Since this work, others have continuously found that age is

(a) Duocentric youth network - not connected

(b) Duocentric youth network - connected
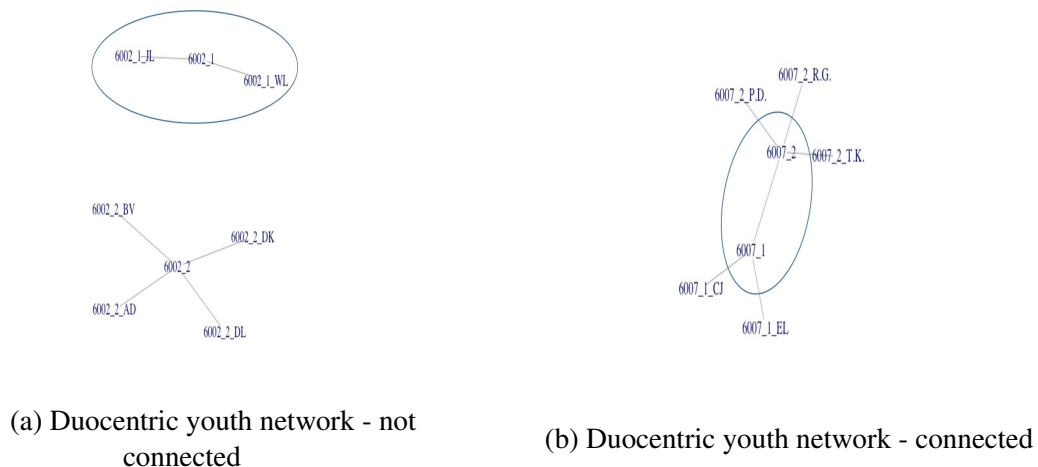
Figure 5.1: Two examples of duocentric networks

an important factor in understanding social support (Shanas, 1979; Van Tilburg, 1998). Additionally, this work has spawned a great deal of understanding about how social support operates differentially by sex (Eagly, 2013; Shumaker and Hill, 1991). The work of Stumblingbear-Riddle and Romans (2012) confirms the work of Vaux, that ethnicity and race are important considerations for exploring social support. Specifically they find that those with high levels of social support also show signs of resiliency. For these reasons, age, gender, and on/off reservation will be included in the models as control variables.

Social support is a composite variable measured from a scale of five items. The youth were asked to indicate how true that personal behavior was for them. Response options included, 'not at all true', 'sometimes true', 'often true', 'always true', 'don't know', and 'refuse' for values ranging from 1-4, respectfully and all 'don't know' responses coded as missing. Responses will be summed across the measures for a total score of social support. The five questions that make up the scale are found in table C.1.

To operationalize mastery for this study, I will use a 13 item scale that measures self mastery, family mastery, and community mastery. Specifically, I will use the multicultural Mastery Scale (MMS) for Youth (Fok et al., 2012), originally developed for Alaska Native youth. Although, other scholars have used this scale in the past using latent variables

(Allen et al., 2014), this scale has high levels of internal validity (α = .80) and can justifiably be used in an averaged score for each mastery sub-scale. For the specific items of the scale see table C.2.

Finally, in addition to network structure measures, this study will operationalize network composition measures using *E-I index* measures for kinship and gender. The E-I index measure was originally presented by Krackhardt and Stern (1988) as a measure to the proportion of external links and internal links of a given domain. Formally, the E-I index measure is calculated as follows:

$$E - I index = \frac{EL - IL}{EL + IL}$$

where EL = the number of external links given the domain of interest and IL = the number of internal links given the domain of interest. Thus, possible scores obtained using this approach range from -1 to +1. A score of -1 would indicate that all links are internal and a score of +1 would indicate that all links are external. For example, if the researcher is interested in and E-I index measure of gender one would identify the gender of the ego (here a female). If this ego nominated six alters and all of these alters were female, the ego would have an E-I index measure of gender with the value of -1. Conversely, if the next ego of interest (also a female) nominated all male alters, their E-I index measure of gender would be a value of +1.

5.4 Analytic Approach

For this chapter I take a social network analysis approach to investigate the role social convoys have on shaping social support, self-mastery, and problem behaviors for Indigenous youth. Social network analysis is a broad term used to describe analyses that

model social relations. The models themselves used in social network analysis range from observational research, qualitative interviews to personal network analyses and up to whole/complete network analysis (Borgatti and Ofem, 2010; Butts, 2009; Wasserman and Faust, 1994). Given this social network analysis continuum of analyses, this chapter will be positioned in the middle of said continuum. First, I will detail the makeup of the youth's social networks to establish what a social convoy for an Indigenous youth looks like. Next, I will take the personal networks collected from the youth, the personal networks of the parent/caregiver and explicitly combining the two. Combining the parent/caregivers network to the youth network will further extend the social convoy model to a localized ecological model of the youth's relations.

From the duocentric networks of the youth, I extract several key measures from the youth's network. Namely, I will extract measures of network size (number of alters nominated by the ego and the number of alters nominated by the caregiver), E-I measure of gender, and a measure of being explicitly connected to a caregiver. These measures can then be added to the data set as traditional covariates in regression models to predict problem behaviors. Given the non-normality of the problem behavior distribution, fitting OLS regression models may violate the assumptions of the model. The right-skewed distribution of the problem behavior suggests that a generalized-linear model should be used with a Poisson distribution specified (Long and Freese, 2006).

Figure 5.2 presents a moderation model to explore the role of youth social convoys and problem behavior. In the figure it is suggested that having a connection to a caregiver will play a moderating role with social network size in predicting problem behavior. More specifically, youth that are connected to a caregiver in the duocentric network along with having larger networks will significantly reduce problem behavior.

Figure 5.2: Hypothetical Model Predicting Problem Behavior
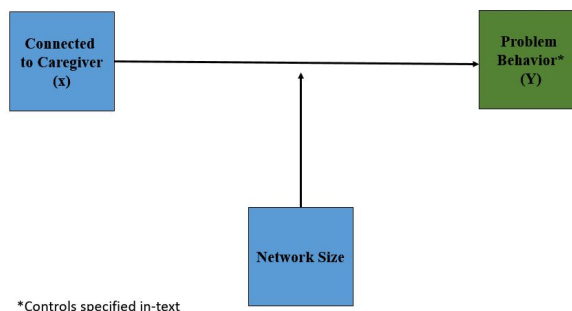
5.4.1   Limits and Adequacy

Several limits should be addressed here. A limitation of this study is that these data did

not explicitly solicit or confirm members of a strict definition of a social convoy. While

I will be able to create a synthetic personal convoy for each youth in the study, my mea-

sures of their networks are proxies for a social convoy. The social convoy models sug-

gests that individuals in the convoy play specific roles to carry the child through their life

course. It is completely possible that parents nominate individuals that never interact with

the child–a co-worker for example. Although these measures are proxy measures of a

social convoy, the information here should shed light on the role kinship, friends, close

friends, and acquaintances and their role in shaping social support and self-mastery for

Indigenous youth.

5.5   Interpretation

The interpretation of the regression models presented in the study are not different than

the interpretation explained in chapter 3. However, the use of *E-I* measures presents a

scale that is unique and should be explained. For this study, the *Y* value is the problem

behavior score at the intercept or when all independent values equal zero. The higher the

intercept value, the more problem behavior the child is associated with at baseline. Each parameter in the model can either make this intercept value increase or decrease. E-I measures range from -1 to +1 and show that for everyone one unit increase in E-I measure (more external links) the coefficient of mastery can also move up or down. I would expect that as E-I measures increase that problem behavior coefficients increase–suggesting that as one increases the number of external ties on any given E-I measure an individual will be less secure in their social convoy and therefore have problem behaviors. Additionally, I would expect that as E-I measures increase that social support and mastery coefficients decrease–suggesting that as external ties on E-I measures increase, an individual will feel less secure in their social convoy and therefore have lower social support and mastery coefficients.

The path models produced in this chapter will allow for review of differential paths to problem behavior. In addition to the assessment of the differential paths to problem behaviors these analyses will be useful for exploring the direct and indirect relationships between social convoys, social support, and mastery on problem behavior. In sum, the path model approach to exploring problem behaviors allows for a nuanced approach to explore the complex construct of problem behavior in a dynamic approach.

5.6   Results

5.6.1   Univariate results

Table 5.1 presents the descriptive statistics for all of the variables included in the study, including the dependent variable, independent variables, and the control variables. As seen in table 5.1, the average externalizing problem behavior score for the youth in the sample was 10.07. Females made up over have the sample at 53% of the sample while

males only accounted for 47% of the sample. The average age of the youth in this study is just above nine (9.10) years old. The majority of the youth lived on the reservation (83%) and had a annual household income below $25K (56%). In terms of the youth networks, 20% of the youth explicitly nominated a caregiver in their networks and had an average E-I index score of .20 for gender composition of their network. This suggests that their networks are, on average, mixed gendered with a slight leaning towards nominating individuals of the opposite sex. Lastly, youth scored an average score of 16.72 for social support scores out of a total possible 27. Likewise, youth reported an average self-mastery score of 41.53 out of a max score of 117.

Table 5.1: Descriptive statistics

Statistic	N	Mean	St. Dev.	Min	Max
Externalizing Problem Behavior	346	10.07	10.09	0	85
Network Size	346	12.53	3.49	4	20
Connected	346	0.20	0.40	0	1
Gender (Female)	346	0.53	0.50	0	1
Youth - age	346	9.10	0.87	8	11
On Reservation	346	0.83	0.37	0	1
Income Below 25K	346	0.56	0.50	0	1
E-I Index (Gender)	346	0.20	0.42	-1.00	1.00
Social Support	346	16.72	2.98	8	27
Self-Mastery	346	41.53	6.79	26	117

5.6.2 Bivariate Results

Correlations

Table 5.2 presents the Pearson's correlation matrix of the all continuous measures used in this study. At the bivariate level, youth externalizing scores was only significantly associated with one other measure. Specifically, externalizing problem behavior was negatively associated with self-mastery (ρ = -0.15, p< .001). Network size, however, was signifi-

cantly associated with age and E-I index for gender ($\rho = 0.14$, p< .05; $\rho = 0.12$, p< .05, respectfully). Age also showed a significant positive correlation with social support ($\rho = 0.15$, p< .01). Lastly, self-mastery was positivley associated with social support scores ($\rho = 0.22$, p< .001).

Table 5.2: Pearson's Correlation Matrix of Externalizing Behavior

	1	2	3	4	5
Externalizing (1)					
Network Size (2)	0.01				
Age (3)	−0.03	0.14*			
E-I Index Gender(4)	−0.02	0.12*	0.07		
Social Support (5)	0.04	0.03	0.15**	−0.02	
Mastery (6)	−0.15**	−0.01	0.1	−0.01	0.22***

*p<0.05; **p<0.01; ***p<0.001

t−tests

A series of group mean t-tests are presented below in tables (5.3 - 5.5). Table 5.3 shows a significant difference in the average score of externalizing problem behavior among the youth that explicitly nominate their caregiver in their networks versus those that do not (connected). Those that do not explicitly nominate a caregiver in their nominations show an average score of 10.51 in the externalizing problem behavior, while those that did nominate their caregiver are shown to have a lower average externalizing problem behavior score of 8.26 (t=1.99, p<.05).

Table 5.3: Group means t-test comparisons of those that are Connected to Caregiver

	Connected				
	No		Yes		
Scale	Mean	SD	Mean	SD	t-test
Externalizing	10.51	10.55	8.26	7.72	1.99*

*p<0.05

Table 5.4 shows a significant difference in the average score of externalizing problem behavior among females and males. Here we see that males scored, on average, 11.50

for externalizing problem behavior, while females in the sample showed an average externalizing score of 8.77. Here we see that the difference in average group score are significantly different (t=2.49, p<.05).

Table 5.4: Gender group means t-test comparisons

| | Gender | | | | |
| | Male | | Female | | |
Scale	Mean	SD	Mean	SD	t-test
Externalizing	11.50	11.54	8.77	8.39	2.49*

*p<0.05

Tables 5.5 and 5.6 show the group mean t-tests for those that live on the reservation, versus those that do not and externalizing scores for those that have an annual household income above and below $25k, respectfully. In each case we do not see that the group means are significantly different at the p<.05 level. Specifically, table 5.5 shows that the average score for those that live off the reservation was 9.22, and 10.24 for those that live on the reservation (t = -0.74). The average externalizing score for those that have an annual household income above $25K is 8.93, while the average score for those that live below that same annual income is 10.97. The group mean difference was not large enough to warrant a significance of p<.05 for table 5.6, but reached marginal significance (t= -1.92, p<.10).

Table 5.5: Group means t-test comparisons of reservation dwelling status

| | On/Off Reservation | | | | |
| | Off | | On | | |
Scale	Mean	SD	Mean	SD	t-test
Externalizing	9.22	9.33	10.24	10.24	-0.74

Table 5.6: Group means t-test comparisons of those Income +/- $25k

| | Income Below $25k | | | | |
| | Above | | Below | | |
Scale	Mean	SD	Mean	SD	t-test
Externalizing	8.93	8.95	10.97	10.84	-1.92

ANOVA

A one-way between subjects ANOVA was conducted to compare the effect of parental education on externalizing problem behavior for parents with a college or graduate level education, high school or less education, and some college. There was no significant effect of amount of education on externalizing problem behavior at the $p<.05$ level for the three conditions. Figure 5.3 is provided as an illustration of the relationship. The qualitative graphical depiction supports the results of the ANOVA; the boxplots do not seem to show an meaningful differences by education level.

Figure 5.3: Boxplot of Externalizing Score by Parent Education
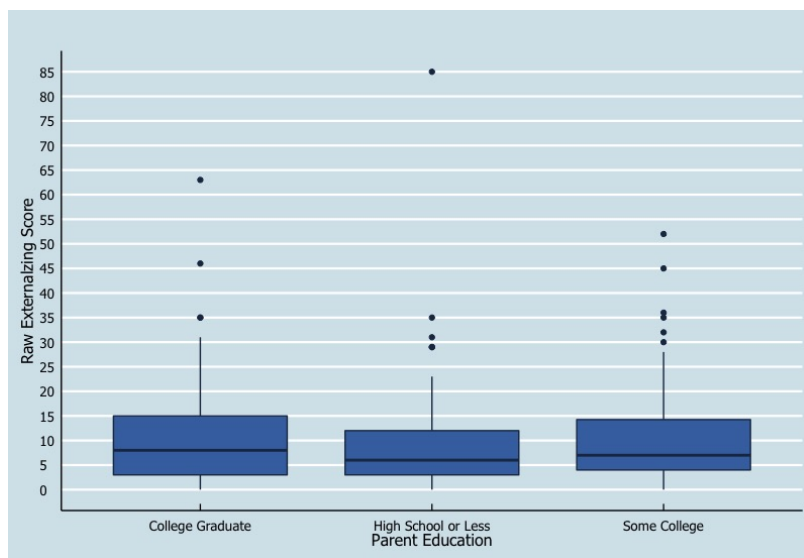
5.6.3 Multivariate Results

Table 5.7 presents the OLS regression predicting externalizing problem behavior of youth in a row summed count for ease of interpretation. In model 1, individuals that explicitly nominated their caregiver as part of their network had significantly lower externalizing problem behaviors compared to those that did not nominate a caregiver, net the effect of network size (β = -2.303; $p<.05$). Model 2, Table 5.7 steps in a host of demographic con-

trol variables as well as social support and self-mastery scores. Here, it is noted that the effect of being connected to a caregiver remains significant in the same direction (β = -2.350; p<.10) with the other factors controlled for in the model. Female youth are associated with a 2.82 decrease in externalizing problem behaviors, compared to their male counterparts - net the effect of all other variables (β = -2.820; p<.05). Youth that have an annual household income below \$25k, compared to those above \$25K are associated with a marginally significant increase in externalizing problem behaviors (β = 1.966; p<.10). Lastly, model suggests that self-mastery is associated with a decrease of externalizing problem behavior scores at the p<0.01 level. However, the effect size is rather marginal (-0.239).

The final model presented in Table 5.7 introduces an interaction effect between network size and being connected to a caregiver. The main effect of being connected is no longer significant here. Similarly, the effect of annual household income is no longer significant here as well. However, females still show significantly lower externalizing problem behavior scores compared to their male counterparts – net the effect of the full model (β = -2.724; p<.05). The effect size, direction, and significance also remains relatively the same for the effect of self-mastery (β = -2.224; p<.01). The interaction term that is stepped in in this model is only marginally significant (β = -0.640; p<.10).

Table 5.7: OLS Regression predicting Externalizing Problem Behavior

	Dependent variable:		
	Externalizing Problem Behavior		
	(1)	(2)	(3)
Intercept	9.812***	20.256***	18.067***
	(2.022)	(6.810)	(6.903)
Network Size	0.056	0.003	0.158
	(0.157)	(0.160)	(0.183)
Connected	−2.303**	−2.350*	6.069
	(1.373)	(1.381)	(4.992)
Youth - Female		−2.820**	−2.724**
		(1.129)	(1.126)
Youth - Age		−0.249	−0.294
		(0.632)	(0.631)
On Reservation		1.863	1.895
		(1.463)	(1.458)
Income Below $25k		1.966*	1.877
		(1.144)	(1.142)
Parent Education			
High School or less		−1.071	−0.999
		(1.543)	(1.539)
Some College +		−0.332	−0.351
		(1.403)	(1.398)
EI Index - Gender		1.187	1.136
		(1.394)	(1.390)
Social Support		0.260	0.255
		(0.188)	(0.187)
Mastery		−0.239***	−0.224***
		(0.081)	(0.081)
Network Size x Connected			−0.640*
			(0.365)
Observations	346	346	346
Adjusted R^2	0.002	0.039	0.045

*p<0.1; **p<0.05; ***p<0.01

The results presented in table 5.7 are rather easy to interpret, however, the right skewed distribution of the dependent variable warrants the need for exploring an alternative transformations of the variable. A common remedy for such a distribution is the use of a natural logarithm transformation of the variable (Berry, 1993; Fox, 1991). Figure 5.4 shows externalizing problem behavior in raw form (left), and the log transformed measure–each with a normal distribution overlaid. The transformed externalizing problem behavior has a distribution that is less likely to violate the assumptions of OLS regression. For this reason, the analyses found in Table 5.7 is replicated in Table 5.8 using the transformed variable as the dependent variable.

Figure 5.4: Histogram of Raw Externalizing Measure and log Transformed Externalizing Measure with Normal Distribution Overlay
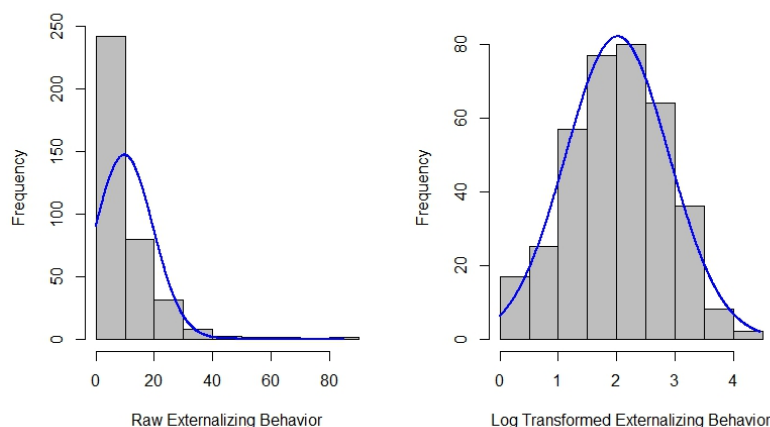
Beyond the fact that the models fitted in table 5.8 use a variable that is much more appropriate for OLS regression, we see other details that justify table 5.8 inclusion here. The adjusted R^2 values for each respective model preforms better in the models using the transformed variable. Further, we see that the significance and directionality of the terms in the models do not differ, with one notable exception. In model 3, table 5.7 we see that the interaction only approaches significance at the $p < .10$ level, but in table 5.8 the interaction in model 3 is now significant at the $p < 0.05$ level.

91

Table 5.8: OLS Regression predicting (Transformed) Externalizing Problem Behavior

	Dependent variable:		
	log (Externalizing Problem Behavior + 1)		
	(1)	(2)	(3)
Intercept	2.030***	3.081***	2.821***
	(0.178)	(0.595)	(0.601)
Network Size	0.005	−0.001	0.018
	(0.014)	(0.014)	(0.016)
Connected	−0.229**	−0.247**	0.754*
	(0.121)	(0.121)	(0.435)
Youth - Female		−0.247**	−0.236**
		(0.099)	(0.098)
Youth - Age		−0.005	−0.011
		(0.055)	(0.055)
On Reservation		0.164	0.168
		(0.128)	(0.127)
Income Below $25k		0.190*	0.179*
		(0.100)	(0.099)
Parent Education			
High School or less		−0.085	−0.076
		(0.135)	(0.134)
Some College +		0.077	0.075
		(0.123)	(0.122)
EI Index - Gender		0.129	0.123
		(0.122)	(0.121)
Social Support		0.009	0.008
		(0.016)	(0.016)
Mastery		−0.024***	−0.022***
		(0.007)	(0.007)
Network Size x Connected			−0.076**
			(0.032)
Observations	346	346	346
Adjusted R^2	0.005	0.052	0.066

*p<0.1; **p<0.05; ***p<0.01

Figure 5.5 presents a graphic presentation of the significant interaction presented in model 3, table 5.8. Here we see that the interaction between a youth's network size and explicitly nominating a caregiver (i.e., AKA "connected") is significantly different.

Specifically, we see that youth that explicitly nominate a caregiver are associated with less problem behavior as their network size increases. Conversely, youth that do not explicitly nominate their caregiver are associated with an increase in problem behavior as their network size increases.

Figure 5.5: Interaction Between Network Size and Caregiver Connection
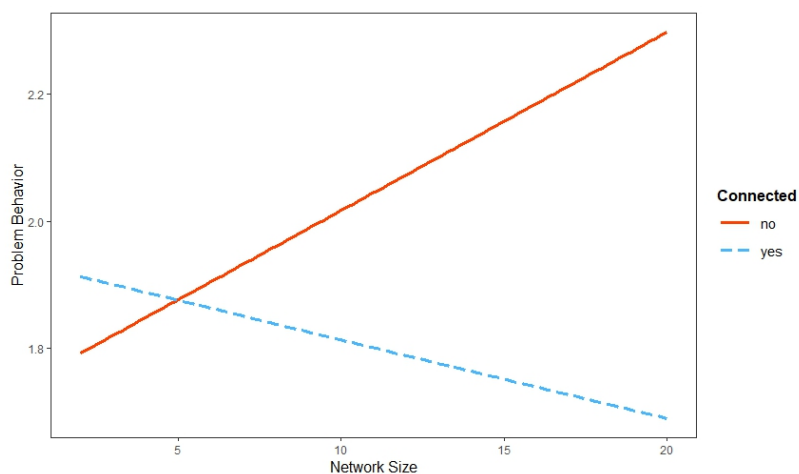
5.7   Discussion

The purpose of this paper was to explore problem behavior among a sample of youth residing on one of four reservations located in the Midwest of the United States that share a common language and culture though a social network lens. Though social network scholars have established the importance of taking a relational approach to understand problem behaviors (Cheadle et al., 2013; Valente et al., 2005; Weerman, 2011). Few, if any, studies apply a relational approach to studies focused on the youth of American Indian populations. This is problematic considering the ample evidence that the structure and values among American Indian populations heavily relies on relations (Red Horse, 1997; Walters and Simoni, 2002). This study contributes is an important step in filling a gap in the literature by using social network and survey data collected from American Indian youth (8-10 years old) and one caregiver. To assess problem behavior, this study

used the Achenbach CBCL (Achenbach and Edelbrock, 1991), specifically the externalizing problem behavior scale. Using these approaches, this paper explores the role of American Indian social networks among youth – in connection with their caregiver networks to create duocentric networks to better understand problem behavior.

The work of Baerveldt et al. (2004) highlights the role of network size as a predictor of problem behavior. It has been argued that more people in ones network will increase delinquency or problem behaviors, but others have unpacked this idea to understand the contextualized differences in network composition (Haynie, 2002). This work motivates hypothesis 3a, that youth with larger networks will have lower problem behaviors, 3b, youth that nominate caregivers in their network will have lower problem behavior, and 3c, youth with large networks but are connected to their caregiver will have lower problem behaviors compared to their counterparts.

To test hypothesis 3a several stages of analyses were conducted. First, the bivariate associated between network size and externalizing problem behavior was conducted using correlation analysis. Correlations between externalizing problem behavior and network size were both non-significant and weakly related. Next, I used multivariate regression to explore the role of network size and externalizing problem behavior–while accounting for the effect of other factors. I found that network size to be a non-significant predictor of externalizing problem behavior as a main effect.

To test hypothesis 3b, being connected (i.e., explicitly nominating a caregiver) underwent a similar set of analytical tests as network size to assess the association between externalizing problem behavior and being connected. Results from t-test show that youth who explicitly nominate a caregiver have significantly lower externalizing problem behavior scores. To test this further, multivariate regressions were conducted. I find that being connected to a caregiver, as a main effect, has a significant main effect across all models, while accounting for control variables.

Lastly, prior work on adolescent problem behavior in a social network framework has largely been defined by studies using the National Longitudinal Study of Adolescent to Adult Health (Add health) (Bearman et al., 2004; Kreager, 2007; McGloin et al., 2014; Schaefer et al., 2011). This work points to an important nuance in the literature. It may be an over simplification to explore network structures (e.g., network size) or network composition (e.g., who one is connected to) in isolation. Here, I hypothesized that the unique interaction between network size and being connected would be a vital consideration in understanding American Indian externalizing behavior (Hypothesis 3c). To test the interaction between network size and being connected to a caregiver in ones' network, the final model of tables 3.5 and 5.8 add an interaction term between the two measures. I find a significant interaction between those that have large social networks and are connected to a caregiver compared to those that are have small networks and are not connected to a caregiver. These results support extant literature that it is not just the size or composition of networks that matter, but often a unique interaction between the two. Furthermore, this points researchers to theories of explanation including differential association, parental monitoring, and behavior modeling learned by parents.

5.7.1 Limitations

This study, like all others, is not without several limitations that should be discussed. The aim of this study was to be inclusive all relations possible that may matter for youth externalizing behavior, however, this study does not claim to have captured a perfect picture of all relations. For example, youth may have important school friends or external friends that were not captured here because of the limitation on nominations allowed, or the survey question. Similarly, we do not confidently capture data from alters nominated by the ego. Although we collected alter information from the ego's perspective, we do not collect data from the alter directly.

Haynie's (2002) work shows that as youth networks are more cohesive (i.e., high level of network density) problem behavior among adolescents is reduced. These results are not stand along results. In fact, several other network scholars have found similar trends (Brass et al., 1998; Falci and McNeely, 2009). Here, density was not included in these analyses as the data among alter-alter relations were only collected among the top three nominations of the ego. Often it is thought that having a dense network is better for an individual if their dense network is comprised of pro-social relations. Again, this study was unable to assess the nature of friendship ties here.

The cross-sectional nature of the data collection limits our understanding of the results in a developmental framework. Further, the age range for the sample in this study is younger than a majority of studies that explore problem behavior among adolescents. Thus, we are limited in the generalizability of our results to a) snapshot of problem behavior removed from the developmental context and b) a young cohort of youth.

The young age of the sample may be critically important to the outcomes we are seeing here. It is entirely possible, that the youth surveyed in the present study will reach developmental stages or social normative climates shortly after these data were collected. Several scholars discussed the developmental process of crime in theoretical terms (Moffitt, 1993; Scott and Grisso, 1997). Additionally, others have explored this empirical question to find support for the claims (Modecki, 2008).

The models presented in this study use non-transformed dependent variable (Table 5.7) and also present results of log-transformed models (Table 5.8). In OLS, as noted in section 3.4.1, models assume a normal distribution for best linear unbiased estimates (BLUE) (Fox, 1991). In many cases, for better or worse, has been relaxed when sample size is sufficiently large. Others, however, recommend computing a log transformed dependent variable then re transforming these coefficients back for interpretation (Ai and Norton, 2000). This study acknowledges the distribution of the dependent variable

and also runs log-transformed models. The models are compared side-by-side for similar directionality and significance. It future work this study would do well to account for the distribution of the dependent variable by running an alternative model (e.g. poisson, GLM, or some form of quantile regression) or retransforming coefficients back into unlogged interpretable values while adjusting for potential heteroscedasticity.

Lastly, it is important to note that the data used in this study come from an intervention program that participants self-selected in to. Larzelere et al. (2004) details some threats to internal validity when interventions are self-selected. He does this across several types of interventions. While cultural adaptations or family-based interventions are notably absent from his discussion, the argument remains. It is argued that interventions often overlook those most in need of the intervention. It is possible that the results here are victim to the same bias. That said, it logically follows that these results are therefore conservative estimates of problem behavior among youth.

5.7.2 Implications and Future Directions

Understanding problem behavior among Indigenous youth through a social network framework is a promising area of research moving forward. The present research provides some initial insights in this area of research. Several considerations are made here for research moving forward. First, this work operates under a social network perspective presented in the social convoy framework and borrows similar approaches noted in prior social network studies that aim to explore adolescent problem behavior. While promising, efforts should be made to work with community partners to capture and model unique Indigenous relational structures that are not accounted for here.

The social convoy model was a motivating perspective that inspired this work. The social convoy model argues that individuals are escorted through their life by specific peo-

ple that play vital and different roles to aid and protect individuals. These core elements are critically important values for American Indian populations. The results of this study, however, assert an empirical reality that is not often captured by most social convoy analysis. Protective factors for problem behaviors are not a simple relationship of number of individuals one has access to in a convoy or network, but certain roles and individuals (here, caregiver connections) may be more important than sheer numbers of a convoy. Alternatively, the social network scholars can learn a great deal from the social convoy perspective as well. Social network scholars often focus on structural aspects of an individual network–yet social convoy scholars have demonstrated the ethnographic-like data captured by collecting data described by Antonnuci (1986) which sheds light on important localized views of relationships in context.

The youth for this study are notably younger than a majority of social network studies. Highlighted here, is the importance of social networks among this age group. Often scholars argue that the use of social networks is beneficial among older adolescents as this age group often transition from reliance on their family networks to peer networks (Cotterell, 2013). Here, we see that social networks are a justifiable and beneficial approach for younger youth as well. Future work should aim to incorporate a relational approach for 8-11 year olds as important correlates of social and behavioral outcomes.

Scholars have long recognized the importance of longitudinal data. The cross-sectional nature of the data for the present study warrants further investigation in a longitudinal context. The current study is an important first step in exploring the associations of network characteristics and problem behavior, however, future work should build on this work for several reasons. First, the developmental process of youth this age for externalizing problem behavior may change rapidly over a short time period. Second, it remains unclear what social networks for Indigenous youth look like over the life course. Third, causal arguments can be tested using longitudinal analyses that cannot be executed here

(Snijders et al., 2010).

The results shown in this study show a promising future for further social network studies among Indigenous populations. The work presented here, informative, but still based on ego-centric networks. Ego networks have both benefits and limitations. Social networks among Indigenous populations is a new area of research. Ego networks are therefore a first step into doing social network research for this area of study. Future research, however, should pursue research among Indigenous youth using complete network data. Data like these can be collected at the community level, school level, or within other organizations on reservations.

BZDDD is a family-based culturally adapted evidence-based intervention. As suggested above, these results support the overall prevention design to make this intervention a family-based approach. One of the sub-aims of BZDDD is to build relationships, communication skills, and parenting techniques with families. The results of this study support this endeavor. Youth that explicitly nominate a caregiver have lower problem behaviors. It remains an empirical question if the prevention program is effective in building relationships, but these results point to a promising future of prevention outcomes.

Indigenous communities can inform and glean information from this study. Future work with community partners should include detailed briefs of these results with opportunity for localized knowledge to inform similar work. Additionally, communities equipped with this knowledge may implement local strategies that increase youth and parent engagement and training. It is also possible to inform specific community organizations that work with families or youth. More example, Schaughency and Ervin (2006) introduce, in a special issue of *School Psychology Review*, a series of articles that aim to build capacity to implement and sustain evidence-based interventions. One focus the authors provide is ways to support and build localized service agency ability to incorporate evidence-based interventions and findings. In sum, real partnership opportunities can be

made to work with and be informed by the communities for better outcomes for youth and to improve research.

Chapter 6

Discussion and Conclusions

Problem behavior among Indigenous youth is a serious concern for communities and academics alike. Scholars have dedicated much effort to understanding the nuances of the many problem behaviors among Indigenous youth (Whitbeck et al., 2014b). Although an impressive body of literature exists to document the disparities of Indigenous youth, few, if any, have adopted a strict relational perspective to understand these disparities. Within the Indigenous literature historical, anthropological, and contemporary works uniformly agree that Indigenous communities are based on systems of kinship, extended kinship, and community relations (Dombrowski et al., 2013b; Walters et al., 2002). This dissertation fills an important gap in the Indigenous problem behavior literature by implementing a relational perspective. To this end, this dissertation builds on the relational literature (Valente, 2010) and the Indigenous health literature.

Presented in the previous chapters are three connected, yet distinct, empirical studies of Indigenous problem behavior using the social convoy model (Antonucci and Akiyama, 1987) as a loose framework. In order to accomplish the aim of providing a relational approach to Indigenous problem behavior, this dissertation details the use of the social convoy model as a guiding theoretical perspective throughout all chapters. In Chapter 3, study one, I explored caregiver-child agreement on emotional and behavior problems using the Child Behavior Checklist and Youth Self-Reports (Achenbach and Edelbrock, 1991). Chapter 3 illustrates unique areas that caregivers and children identify similar patterns of behavior that has not been seen in the extant parent-child agreement literature.

Furthermore, Chapter 3, study one, provides insights into the demographic characteristics of the children and caregivers that facilitate increased agreement—which is promising for targeted intervention efforts to find and address the most at-risk Indigenous families.

Chapter 4, study two, of this dissertation adds to the existing body of literature in several meaningful ways. First, researchers who explore adolescent development and problem behaviors have made calls for research to extend the scope of potential mechanisms that contribute to adolescent problem behavior (Slomkowski et al., 2001). Specifically, work has been called to move beyond parent influence on child problem behaviors, and to consider other family dynamics. This chapter, therefore, explores data among Indigenous siblings on problem behavior. To answer these recent calls of the literature and to extend the social convoy model, this chapter is not exclusive to siblings, but also controls for parental monitoring.

The final study of this dissertation is found in Chapter 5. Unlike any other study within the Indigenous literature, this chapter extends the social convoy model to a full social convoy. Taking the personal networks provided by the youth and the personal networks provided by the youths' caregiver, I explicitly combined the two, to create one localized ecological personal network or duocentric network for the youth to assess problem behaviors and the meditating role of social support and self-mastery. The research prior to this study on Indigenous youth have offered proxy measures for youth connectedness and relations, but never has a study had data to explicitly assess relations like the data used in Chapter 5. Exploring these nuanced youth networks will help provide meaningful empirical assessment of these close kinship networks.

6.1   Problem Behaviors among Indigenous Youth

Although Indigenous populations are often underrepresented in research, one area of research that has seen a considerable among of attention among Indigenous population is the focus on problem behaviors. Many communities have deep concern for the well-being of their young community members and thus spend a great deal of time, energy and limited resources on helping youth. This line of research has been discussed in the introduction of this dissertation (chapter 1), however, it is reiterated here as it is vital to situate this dissertation in the broader literature.

This dissertation approaches problem behaviors among Indigenous youth in three distinct chapters that individually add to the greater body of literature. First, this dissertation explores internalizing and externalizing behaviors in terms of agreement between youth and caregivers (chapter 3). Second, this dissertation adds to the growing concern of sibling influence on problem behavior (chapter 4). Lastly, this dissertation explores the role of social convoys as predictors of problem behavior (chapter 5). Together the findings present a dialog between the existing literature and the results presented here.

Whitbeck et al. (2014b) cautions against painting Indigenous youth as being prone to problem behavior as they make up such a small subgroup of overall sample. The results of this dissertation would support and echo the same sentiment. Across all studies presented in this dissertation the distribution of problem behaviors (i.e., namely externalizing behavior here) is a strong right skewed distribution (note figure 5.4 for visual). Unlike Whitbeck and colleagues (2014b) this study is a cross-sectional look into problem behavior among Indigenous populations, however the initial findings support the claims that: a) not all Indigenous youth exhibit problem behaviors and b) the manifestation of these problem behaviors in this dissertation may be a reflection of "adolescent-limited" problem behaviors and not a true indicator of life-course-persistent problem behavior (Moffitt,

1993).

Investigators that have explored problem behaviors among this population have often relied heavily on ecological theories to understand problem behaviors (Markham et al., 2015; Okamoto et al., 2006; Yabiku et al., 2007). For many the Brofenbrenner (1977) model has shown promise in its ability to understand problem behaviors using this framework. I would not contend that these studies are wrong, however, this dissertation uses a more narrow ecological approach to explore problem behavior–namely the social convoy model (Antonucci et al., 2013). In fact, the continuous support for the Brofenbrenner's ecological approach suggest that a more refined approach may be a worthy line of inquiry. Here this dissertation (chapter 5) aims to explore the ecology of relationships to understand problem behavior rather than the broader focus of all ecological factors (e.g., microsystems, mesosystems, and macrosystems). Indeed a finer resolution on relational structures within Brofenbrenner's ecological systems microsystems stage proves to be very important in predicting problem behaviors.

To my knowledge, there are no prior studies that have taken a relational approach to explore adolescent problem behaviors among Indigenous youth. The results of this dissertation (chapters 4 and 5) provide initial support for taking a relational approach for this population. Although others have documented the unique structures of Indigenous community relations and the reliance on said relations, this dissertations affirms the ability for other scholars to incorporate more relational perspectives in their efforts. Taking a relational approach has proven fruitful in terms of scientific outcomes, yet it is also a culturally congruent approach to doing research among this population. Furthermore, on a logistical note, doing community work does not often afford investigators large samples that are the "gold standard" within the academy and funding agencies, however, using a relational approach affords investigators the opportunity to conduct uncompromising science without the pressure of obtaining the typical large samples often demanded by rigorous

statistical models. Given the fact that only a small portion of Indigenous youth actually display long term problem behaviors, one may be able to target these smaller subgroups and still conduct rigorous research using social network analysis.

6.2   Relational Perspective

The large proportion of the adolescent literature relies heavily on mostly White, national samples. Furthermore, one of the driving motivations for employing a relational approach among adolescents is the notion that as youth get older they rely more heavily on their peers rather than their parents. It is unknown if the same developmental processes are at stake for Indigenous youth, however, the heavy reliance and importance placed on kinship, extended kin, and local community among Indigenous communities motivates the relational approach that this dissertation takes to understand problem behavior. To this end, this dissertation presents three studies that inform the general relational literature. Specifically, this dissertation stresses the importance of caregivers (chapters 3, 4, and 5) as an important figure for youth. Furthermore, this dissertation, using unique dyadic data techniques (chapter 4) highlights important family and sibling dynamics for explaining problem behavior among Indigenous youth. Lastly, the work of this dissertation (chapter 5) builds on the duo-centric network framework, popularized in the family literature among couples, to new applications between parents and youth.

The results of this dissertation add significant contributions to the literature in several meaningful ways. Social network analysis is still a growing field and approach to understanding social and behavioral outcomes. This dissertation applies techniques, approaches, and models that are common among social network scholars, yet does so in an undeserved population. As such, this dissertation informs social network scholars and other relational scholars to think beyond the paradigms of relations in a colonized and

mainstream White framework. Using the tools and theories already in existence to explain relations and relational outcomes is a valuable approach, but it is my hope that the future scholars using a social network framework to explore outcomes among Indigenous populations will have the opportunity to explore and incorporate unique relational structures found in Indigenous communities as well as the meaning making behind said relational structures.

Unique relational structures and meaning behind relational structures are undoubtedly present for this sample. I stress to the readers, however, to view the unique structures and challenges of doing relational research among undeserved populations as an opportunity to inform the larger body of literature. Lee and colleagues (2018) demonstrate a new and efficient way to collect relational data within several isolated Indigenous communities. Their work highlights how the unique struggles and challenges of doing work for Indigenous communities can have beneficial outcomes for the larger body of relational scholars. So while findings presented in this dissertation may not generalize beyond Indigenous youth or age groups sampled here, an optimistic reader may be inclined to piece together how this work informs a larger body of work.

6.3 Policy Implications

Generally, behavioral prevention programs that aim to reduce or prevent problem behaviors lack one unifying characteristic that is the "gold standard" area of focus or method to achieve this goal. Problem behaviors are vast and vary by age group, ethnic/racial group, and region. The specific focus of problem behavior prevention programs range from substance use (Ennett et al., 1994), anti-social behavior (Mayer, 1995), criminal behavior (Koffman et al., 2009), suicide (Goldston et al., 2008), and other unique holistic approaches. To address these forms of problem behaviors, prevention scientists have

taken family-based approaches (Kumpfer et al., 2002), school-based approaches (Greenberg et al., 2003), social norm education approaches (Perkins, 2002), and communitywide approach (Lauby et al., 2000) to prevention efforts. The results are not always clear, however, Nation et al. (2003) discuss the conditions in which effective prevention programs often occur. They found that prevention programs are effective when nine specific conditions were met in prevention implementation: Programs were comprehensive, included varied teaching methods, provided sufficient dosage, were theory driven, provided opportunities for positive relationships, were appropriately timed, were socioculturally relevant, included outcome evaluation, and involved well-trained staff.

The three studies presented in this dissertation have the potential for informing prevention and intervention policy. I argue here that this dissertation sheds light on possible prevention and intervention policies moving forward for problem behavior among Indigenous youth. Specifically, the results of this dissertations support the notion that a caregiver approach may be necessary for prevention of problem behaviors. Second, I advocate, like Nation et al. (2003), prevention work should be comprehensive, multi-faceted, and appropriately timed. Lastly, this work builds on the efforts discussed by Whitbeck and colleagues (2008), that effective prevention for Indigenous youth is most effective when entire families are central to the intervention, extended kin are included, and when cultural norms are valued.

The results of this dissertation (chapters 3 and 5) stress the importance of caregiver involvement in prevention efforts. Others have found that having caregivers participate in prevention efforts is an effective approach to reduce health and behavior disparities. For example, Szapocznik et al. (1988) randomly assigned youth suspected of using drugs into a family-based prevention program while the others were assigned to prevention efforts typical at the time — sans caregiver support. They found that the youth assigned to family-based prevention were far more likely to complete the program and to have bet-

ter outcomes. This approach to prevention and intervention work has been made popular through evidence based interventions such as Iowa's Strengthening Families Program (Spoth and Redmond, 2002) which has been adapted for many age groups across the country and for targeted ethnic and racial groups, such as the present study. For Indigenous youth, the inclusion of caregiver integration into prevention programs may be more meaningful than for mainstream adolescents. In ecological approaches – both Bronfrenbrenner and the social convoy model – caregivers are some of the most proximal characters. This dissertations supports literature that caregivers should play a vital role in the intervention or prevention efforts to reduce problem behavior.

Nation and Colleagues (2003) point out that effective prevention work is often more complex than one singular focus or method of delivery. Further, they also discuss the need for effective prevention programs to be appropriately timed. The results of this dissertation shows that even at the young age group of this sample (8-11) problem behaviors for this sample are already reaching levels that are alarming. Attempting to prevent the problem behaviors may be a moot point if prevention programs among similar Indigenous populations target older cohorts. Policy and prevention efforts moving forwards should be keenly aware of problem behavior distributions across the adolescent life-course in early stages of study design.

The results of this dissertation (in chapters 4 and 5) support the claims made by Goldston et al. (2008). These authors argue that Indigenous problem behavior (in their case, suicide) prevention is best targeted at the kinship (direct and extended) and community levels. Further, it is argued that effective prevention for this group take a culturally appropriate approach to prevention and intervention. Indeed, Whitbeck (2006) discusses at length the important considerations for effective prevention partnerships with Indigenous communities. Several scholars have discussed the process in which one can adapt (Ivanich et al., 2018) or create (Allen et al., 2009; Wexler, 2006) prevention programs for

Indigenous youth problem behaviors. A common theme across these domains of prevention work for Indigenous communities is the strong notion that community and culture are effective means of reducing problem behavior – not a sole reliance on evidence-based practices, as these may not work for Indigenous communities.

To achieve these goals, one should also be aware of the localized context. The diversity of difference across all federally, state, and local Indigenous communities in North American is complex and warrants thoughtful consideration when attempting to implement a prevention or intervention program. In the likely case that investigators aim to adapt a prevention program with a community partner, one should begin with the *Iterative adaptation process* presented by Ivanich et al. (2018). To implement an effective culturally adapted program of an evidence-based prevention program, one should spend time deciding if adaptation is the correct path or if one should create a *ground-up* prevention program – discussed by Okamoto et al. (2014). If the decision has been made to adapt an evidence-based prevention program to be culturally appropriate, those involved should incorporate or consider community review, feasibility restraints, scientific review, evidence of effectiveness, fidelity to core components of the original program, and make adaptations based on cultural knowledge and practices. In the end, prevention programs and community partnerships are often successful if built on the guidelines presented by Whitbeck (2006), see table 6.1.

6.4   Conclusion

In summary, this dissertation adds significant findings to the literature. Several bodies of literature stand to profit the work conducted here. In general, the focus of this dissertation is aimed to understand problem behaviors and general well being among Indigenous youth. However, this dissertation also provides valuable insights for the literature

Table 6.1: Whitbeck's (2006) Guiding Assumptions for Prevention Research Partnerships With Native American Communities

1	Prevention efforts must proceed nation by nation.
2	Native American cultures contain all the necessary knowledge to socialize mentally healthy, alcohol- and drug-free children. This knowledge need not be replaced with information and socialization techniques derived from European culture
3	Cultural ways and knowledge must be viewed as equal to social science prevention knowledge.
4	There exist within Native American cultures developmental risk and protective factors, which operate independently and in interaction with key risk and protective factors known in the majority population. Failure to identify these factors and consider them will mean that prevention efforts will not address important mechanisms affecting the prevention outcome.
5	Ownership must exist for culturally specific prevention programs to be successful.
6	There is a "hunger" among Native American adults and adolescents for their cultural knowledge.

on parent-child agreement and contributes substantially to the social network literature—

which has historically focused on large national-level data comprised of primarily White

youth.

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Appendix A

Study 1 Measures

A.1 Achenbach Youth Self-Report Scale

0 = Not True; 1 = Somewhat or Sometimes True; 2 = Very True or Often True

Table A.1: Achenbach Youth Self-Report Scale

1.	I act too young for my age
2.	I drink alcohol without my parents' approval
3.	I argue a lot
4.	I fail to finish things that I start
5.	There is very little that I enjoy
6.	I like animals
7.	I brag
8.	I have trouble concentrating or paying attention
9.	I can't get my mind off certain thoughts
10.	I have trouble sitting still
11.	I'm too dependent on adults
12.	I feel lonely
13.	I feel confused or in a fog
14.	I cry a lot
15.	I am pretty honest
16.	I am mean to others
17.	I daydream a lot
18.	I try to get a lot of attention
19.	I destroy my own things
20.	I destroy things belonging to others
21.	I disobey my parents
22.	I disobey at school
23.	I don't eat as well as I should
24.	I don't get along with other kids
25.	I don't feel guilty after doing something I shouldn't
26.	I am jealous of others

27.	I break rules at home, school, or elsewhere
28.	I am afraid of certain animals, situations, or places, other than school
29.	I am afraid of going to school
30.	I am afraid I might think or do something bad
31.	I feel that I have to be perfect
32.	I feel that no one loves me
33.	I feel that others are out to get me
34.	I feel worthless or inferior
35.	I accidentally get hurt a lot
36.	I get in many fights
37.	I get teased a lot
38.	I hang around with kids who get in trouble
39.	I act without stopping to think
40.	I would rather be alone than with others
41.	I lie or cheat
42.	I bite my fingernails
43.	I am nervous or tense
44.	Parts of my body twitch or make nervous movements
45.	I have nightmares
46.	I am not liked by other kids
47.	I can do certain things better than most kids
48.	I am too fearful or anxious
49.	I feel dizzy or lightheaded
50.	I feel too guilty
51.	I eat too much
52.	I feel overtired without good reason
53.	I am overweight
54.	Physical Problems without known medical cause:

a.   Aches or pains, NOT stomach or headaches

b.   Headaches

c.   Nausea, feel sick

d.   Problems with eyes, NOT if corrected by glasses

e.   Rashes or other skin problems

f.   Stomachaches

g.   Vomiting, throwing up

55.	I physically attack people
56.	I pick skin or other parts of my body
57.	I can be pretty friendly

58.	I like to try new things
59.	My school work is poor
60.	I am poorly coordinated or clumsy
61.	I would rather be with older kids than kids my own age
62.	I would rather be with younger kids than kids my own age
63.	I refuse to talk
64.	I repeat certain acts over and over
65.	I run away from home
66.	I scream a lot
67.	I am secretive or keep things to myself
68.	I am self-conscious or easily embarrassed
69.	I set fires
70.	I can work well with my hands
71.	I show off or clown
72.	I am too shy or timid
73.	I sleep less than most kids
74.	I sleep more than most kids during day and/or night
75.	I am inattentive or easily distracted
76.	I have speech problems
77.	I stand up for my rights
78.	I steal at home
79.	I steal from places other than my home
80.	I store up too many things I don't need
81.	I do things other people think are strange
82.	I have thoughts that other people would think are strange
83.	I am stubborn
84.	My moods or feelings change suddenly
85.	I enjoy being with people
86.	I am suspicious
87.	I swear or use dirty language
88.	I like to make others laugh
89.	I talk too much
90.	I tease others a lot
91.	I have a hot temper
92.	I threaten to hurt people
93.	I like to help others
94.	I smoke, chew, or sniff tobacco
95.	I have trouble sleeping
96.	I cut classes or skip school
97.	I don't have much energy
98.	I am unhappy, sad, or depressed
99.	I am louder than other kids
100.	I use drugs for nonmedical purposes, DON'T included alcohol or tobacco
101.	I like to be fair to others
102.	I enjoy a good joke

103.	I like to take life easy
104.	I try to help other people when I can
105.	I keep from getting involved with others
106.	I worry a lot

A.2 Achenbach Adult Child Behavior Checklist

0 = Not True; 1 = Somewhat or Sometimes True; 2 = Very True or Often True

Table A.2: Achenbach Adult Child Behavior Checklist

1.	Acts too young for his/her age
2.	Drinksalcoholwithoutparents'approval
3.	Argues a lot
4.	Fails to finish things he/she starts
5.	There is very little he/she enjoys
6.	Bowel movements outside toilet
7.	Bragging, boasting
8.	Can't concentrate, can't pay attention for long
9.	Can't get his/her mind off certain thoughts; obsessions
10.	Can't sit still, restless, or hyper active
11.	Clings to or is too dependent on adults
12.	Complains of loneliness
13.	Confused or seems to be in a fog
14.	Cries a lot
15.	Cruel to animals
16.	Cruelty, bullying, or meanness to others
17.	Daydreams or gets lost in his/her thoughts
18.	Demands a lot of attention
19.	Destroys his/her own things
20.	Destroys things belonging to his/her family or others
21.	Disobedient at home
22.	Disobedient at school
23.	Doesn't eat well
24.	Doesn't get along with other kids
25.	Doesn't seem to feel guilty after misbehaving
26.	Easily jealous
27.	Breaks rules at home, school, or elsewhere
28.	Fears certain animals, situations, or places other than school
29.	Fears going to school
30.	Fears he/she might do something bad
31.	Feels he/she has to be perfect

32.	Feels or complains that no one loves him/or her
33.	Feels others are out to get him/her
34.	Feels worthless or inferior
35.	Gets hurt a lot, accident-prone
36.	Gets in many fights
37.	Gets teased a lot
38.	Hangs around others who get in trouble
39.	Impulsive or acts without thinking
40.	Would rather be alone than with others
41.	Lying or cheating
42.	Bites fingernails
43.	Nervous, high strung, or tense
44.	Nervous movements or twitching
45.	Nightmares
46.	Not liked by other kids
47.	Constipated, doesn't move bowels
48.	Too fearful or anxious
49.	Feels dizzy or light headed
50.	Feels too guilty
51.	Over eating
52.	Overtired without good reason
53.	Overweight
54.	Physical problems without known medical cause:

Aches or pains, NOT stomach or headaches

a.

Headaches

b.

Nausea, feels sick

c.

Problems with eyes, not corrected by glasses

d.

Rashes or other skin problems

e.

Stomachaches

f.

Vomiting, throwing up

g.

55.	Physically attacks people
56.	Picks nose, skin, or other parts of body
57.	Poor school work
58.	Poorly coordinated or clumsy
59.	Prefers being with older kids
60.	Prefers being with younger kids
61.	Refuses to talk
62.	Repeats certain acts over and over; compulsions

63.	Runs away from home
64.	Screams a lot
65.	Secretive, keeps things to self
66.	Self-conscious or easily embarrassed
67.	Sets fires
68.	Showing off or clowning
69.	Too shy or timid
70.	Sleeps less than most kids
71.	Sleeps more than most kids
72.	Inattentive or easily distracted
73.	Speech problem
74.	Stares blankly
75.	Steals at home
76.	Steals outside the home
77.	Stores up too many things he/she doesn't need
78.	Strange behavior
79.	Strange ideas
80.	Stubborn, sullen, or irritable
81.	Sudden changes in mood or feelings
82.	Sulks a lot
83.	Swearing or obscene language
84.	Talks or walks in sleep
85.	Talks too much
86.	Teases a lot
87.	Temper tantrums or hot temper
88.	Threatens people
89.	Thumb-sucking
90.	Smokes, chews, or sniffs tobacco
91.	Trouble sleeping
92.	Truancy, skips school
93.	Underactive, slow moving, or lacks energy
94.	Unhappy, sad, or depressed
95.	Unusually loud
96.	Uses drugs for nonmedical purpose, don't include alcohol or tobacco
97.	Vandalism
98.	Wets self during the day
99.	Wets the bed
100.	Whining
101.	Withdrawn, doesn't get involved with others
102.	Worries

Appendix B

Study 2 Measures

B.1 Parental Engagement

1 = Strongly Disagree; 2 = Disagree; 3 = Agree; 4 = Strongly Agree

Table B.1: Parental Engagement

1. I know a lot about what goes on in my childs life.
2. I really know how my child feels about things.
3. I do special things with my child.
4. I set aside time to talk to my child about what is important to [him/her].
5. I can always find time for my child.
6. I make it clear what will happen if my child does not follow our rules.
7. I make it clear to my child what I expect from [him/her].
8. When I tell my child Ill do something, I do it.
9. If my child has a problem, I help [him/her] figure out what to do about it.
10. I expect my child to follow our family rules.
11. I encourage my child to express [his/her] feelings even when they are hard to hear.
12. I encourage my child to express [his/her] opinions even when I dont agree with them.
13. I trust my child.
14. I know how to calm my child down when he/she loses his/her temper.
15. I closely monitor my childs progress at school.
16. I talk regularly with my childs teacher about how my child is doing in class.
17. I monitor my childs homework.
18. I take my child to community activities.
19. I volunteer for community activities.
20. I encourage my child to volunteer for community activities.

Appendix C

Study 3 Measures

C.1   Social Support Scale

1 = Not at all true; 2 = Sometimes True; 3 = Often True; 4 = Always True

Table C.1: Social Support Scale

1.   There is someone I can talk to about things that bother me.
2.   When I am feeling upset, there is someone I know that makes me feel better.
3.   I feel that I have a circle of people who value me.
4.   There is someone in my life that makes me feel worthwhile.
5.   There is at least one person that I feel I can trust.

C.2   Multicultural Mastery Scale (MMS)

1 = Strongly Disagree; 2 = Disagree; 3 = Agree; 4 = Strongly Agree

Table C.2: Multicultural Mastery Scale (MMS) (Fok et al., 2012)

1.	Working together with friends I can solve many of my problems.
2.	I can change many of the important things in my life with the help of my friends.
3.	I can do what I set my mind to do because I have the support of my friends.
4.	What happens to me in the future mostly depends on my being supported by friends.
5.	Working together with family I can solve many of my problems.
6.	I can change many of the important things in my life with the help of my family.
7.	I can do what I set my mind to do because I have the support of my family.
8.	What happens to me in the future mostly depends on my being supported by family.
9.	I can solve many of the problems I have on my own.
10.	I can change many of the important things in my life.
11.	I do well even when things are tough.
12.	What happens to me mostly depends on me.
13.	I can do just about anything I really set my mind to do.