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UNIVERSITY OF MIAMI

EXTERNALIZING PROBLEMS AND HISPANIC/LATINX ADOLESCENTS: A
BIOECOLOGICAL APPROACH

By

Evan Thomas Stanforth

A DISSERTATION

Submitted to the Faculty
of the University of Miami
in partial fulfillment of the requirements for
the degree of Doctor of Philosophy

Coral Gables, Florida

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BIOECOLOGICAL APPROACH

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Externalizing problems often develop during adolescence and cause harm to the individuals with these problems and to others in society. Hispanic/Latinx adolescents develop externalizing problems at relatively higher rates and in ways that involve systemic influences. The present study aimed to enhance clarity in this area by examining externalizing problems as a dimension of psychopathology and applying constructs of Bronfenbrenner's bioecological theory (2005). This was attempted by examining: a) externalizing problems as a continuous spectrum, b₁) relations the problems have with *proximal processes* of adolescent-caregiver relations, b₂) and exploring differences across *contexts* specified as three immigration-based groups (1st generation immigrant, 2nd generation, or 3rd generation and beyond). Data was aggregated from multiple NIH-funded studies with Hispanic/Latinx adolescent-caregiver dyads ($n = 529$). Structural equation models examined externalizing problems as a latent variable, its association with adolescent-caregiver variables, and multigroup strategies were used to explore differences involving immigration history. Results supported a model of externalizing psychopathology (with oppositional defiant disorder, conduct disorder, and attention-deficit/hyperactivity disorder). Adolescent-caregiver variables, including parenting practices and attachment, showed negative associations with

externalizing problems. There was evidence that 2nd generation immigrant adolescents may have higher rates of externalizing problems relative to other adolescents. This study has advanced research of externalizing problems within Hispanic/Latinx adolescents by conceptualizing with theories of both psychopathology and Bronfenbrenner. The healthy development and well-being of Hispanic/Latinx individuals has great importance and it is imperative to recognize the individual, developmental processes, and contexts in which they exist.

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CHAPTER ONE: INTRODUCTION

Adolescence is a stage of development characterized by an emerging level of physical maturity as well as role transitions that include behavior changes that set the stage for adult life. Adolescence is often a period for the emergence of health-risk behaviors – recognized as leading causes of death and disease and monitored in this age group since 1991 through Youth Risk Behavior Surveillance (YRBS; Kann et al., 2018). A subset of the health-risk behaviors in this survey can be considered risk-taking behaviors, including the use of tobacco, use of alcohol and other drugs, engagement in sexual behaviors (e.g., Donovan & Jessor, 1985; McGee & Newcomb, 1992), as well as behaviors that contribute to unintentional injury or violence (e.g., unsafe driving practices or getting into fights; Chein, Albert, O’Brien, Uckert, Steinberg, 2011; Steinberg, 2008). Relative to other developmental stages, adolescents have a heightened likelihood to engage in various forms of risk-taking behaviors (Ellis et al., 2012; Steinberg, 2008) and the age-specific tendencies likely contributes to the focus on these behaviors in public health research such as the YRBS. These risk-taking behaviors are directly linked to the development of addiction, perpetration of crime and resultant legal trouble, as well as the acquisition and spread of sexually transmitted diseases. It is unfortunate and concerning that adolescents may not always consider the serious stakes of risk-taking behaviors, a tendency thought to stem from an underdeveloped level psychosocial maturity (Steinberg, 2008). Adolescent risk-taking behaviors can cause lifelong consequences for the developing adolescent and members of society.

Risk-Taking Behaviors and Externalizing Problems

Various risk-taking behaviors have been recognized to occur in patterns by cooccurring within individuals. Specifically, factor analytic techniques have been used to demonstrate higher order spectra that explain the covariance between substance use, sexual behavior, and criminal activity from adolescence to adulthood (Donovan & Jessor, 1985; McGee & Newcomb, 1992). Broadband spectra capture a “general deviance syndrome” (McGee & Newcomb, 1992), a “syndrome of problem behavior” (Donovan & Jessor, 1985; Donovan, Jessor, & Costa, 1988), or “generalized risk” (Palmer et al., 2009). In other words, there is evidence of an overarching risk-taking approach that drives individuals, rather than a tendency to solely engage in specific risky behaviors; individuals who take risks tend to engage in an array of risk-taking behaviors and engaging in one behavior can increase the likelihood of engaging others. However, the co-occurrence of deviance or problem behaviors are thought have interrelations that expanded beyond observed behaviors, with implications for the etiology of the behaviors, definitions of psychopathology, as well as with prevention and intervention efforts (Donovan & Jessor, 1985; McGee & Newcomb, 1992). The confluence of risk-taking behaviors within adolescents creates a concentrated threat that can cause harm to the adolescent and others.

Conceptualizing externalizing problems. I will use the term externalizing problems to mean observed risk-taking behaviors, and also the aspects of functioning within the individual that are thought to contribute to the observed risk-taking behaviors. Observed risk-taking behaviors are one facet of a broader phenomenon, also noted to include cognitive motivations and attitudes (Newcomb, Chou, Bentler, & Huba, 1988) or

personality and worldviews that are oriented towards unconventionality (Donovan & Jessor, 1985; Donovan, Jessor, & Costa, 1991). A similar line of research converges with investigations of risk-taking behaviors and has identified spectra of externalizing disorders that include substance use disorders and conduct disorder, and antisocial personality disorder (Caspi et al., 2014; Krueger, 1999; Witkiewitz et al., 2013). This psychopathology research implies that observed risk-taking behaviors are one indicator of the problem and that externalizing patterns are a result of interrelated processes between genes, neurons and brain functioning, intrapsychic traits or aspects of personality, to the observed behavior, all accounted for by processes involving the person's biological potential and their environment (Caspi et al., 2014; Kotov et al., 2017). The externalizing spectrum of psychopathology develops through complex exchanges involving nature and nurture and is a dimension that includes risk-taking behaviors. The present study conceptualizes externalizing problems based on a dimensional approach to psychopathology, considering risk-taking behaviors to be a component of an externalizing spectrum of psychopathology.

A concern with the term externalizing problems is the risk of pathologizing the individual who experiences elevations in the spectrum. Recent scholars have challenged labels such as these because of the imposition of values (Ellis et al., 2012). Specifically, Ellis and colleagues (2012) describe how there is a tendency for scholars to create a dichotomy of "good" and "bad" outcomes, defined as such based on cultural values of Western society. I aim to decentralize the "location" of the pathology by recognizing the role of contextual processes in the origins of externalizing problems. That is, rather than a phenomenon that solely exists within the individual, I add that key social processes can

elicit or contribute to externalizing behaviors (be it in abuse that can exist within a family, the resource deprivation that can affect communities, or the hostility that can exist in the geopolitical climate of an entire nation). Externalizing problems are an ailment involving social processes and these problems have an impact on both individuals and social structures that comprise society.

Externalizing Problems within Hispanic/Latinx Adolescents

Understanding externalizing problems within Hispanic and/or Latinx adolescents has importance because of evidence for heightened risk for specific forms of externalizing problems and the increased severity of consequences from externalizing problems. When examining substance use, a particularly concerning pattern emerges when comparing Hispanic/Latinx adolescents to other racial/ethnic groups. The most recent report for the 2017 YRBS showed Hispanic/Latinx are just as likely or more likely than other racial/ethnic groups to use various substances (Kann et al., 2018). This study showed that (relative to Whites and African Americans) Hispanic/Latinx high schoolers have among the highest rates of ever using cigarettes, alcohol, marijuana, synthetic marijuana, cocaine, inhalants, heroin, hallucinogens, ecstasy, prescription misuse, and inhalants. Methamphetamine was the only substances which Hispanics/Latinx did not appear to have significantly higher rates of use than other racial/ethnic groups (rates of use were not significantly lower than other racial/ethnic groups either; Kann et al., 2018). Monitoring the Future is a similar population-level study that is conducted annually and examines 8th-12th graders, showing that for several years Hispanic/Latinx adolescents have maintained the highest rates of using any substance relative to Whites and African Americans (e.g., Johnson, O'Malley, Miech, Bacchman, & Schulenberg, 2017; 2016;

2015). Additionally, Monitoring the Future reports racial/ethnic patterns by age group and Hispanic/Latinx also have the highest rates of using substances in the youngest group, 8th graders (Johnson et al., 2017). This early onset of use is particularly concerning when considering there tends to be more serious substance use problems when there is a younger age of onset (Anthony & Petronis, 1995; Chen, Storr, & Anthony, 2009; Flory, Lynam, Milich, Leukefeld, & Clayton, 2004; Griffen, Bang, & Botvin, 2010; Hingson & Zha, 2009; Patrick & Schulenberg, 2010; Stueve & O'Donnell, 2005). Taken together, these population-level studies suggest that Hispanic/Latinx adolescents have heightened risk for substance-related problems due to engagement in substance use, early age of onset, and potentially through the use of multiple substances. These population-level disparities of substance use suggest that Hispanic/Latinx adolescents have elevated rates of substance use, a primary component of externalizing problems.

Hispanic/Latinx individuals who have externalizing problems face harsh consequences or similar concerning reactions in comparison to other racial/ethnic groups demonstrating these problems, particularly White individuals. For example, racial/ethnic minority individuals are disproportionately incarcerated, and this pattern is suggested to weaken an already marginalized family unit and create risk of externalizing problems in subsequent generations (Wakefield & Wildeman, 2011). Experiences of oppression and discrimination from police and within the legal system (Carter, 2007) likely account for some degree of the disproportionate incarcerations and intensify the social consequences of externalizing problems within Hispanic/Latinx adolescents. The substance abuse, violence, and AIDS (SAVA) syndemic is a phenomenon that affects marginalized

populations and was conceptualized from research within a predominantly Puerto Rican community (Singer, 2000). Although the terms that make up the SAVA can be observed within individuals, Singer (2000) proposed that this problem is caused and maintained by social and political forces that systemically deprive entire communities. For example, Hispanic/Latinx adolescents are less likely to receive treatment for substance use disorders, relative to White adolescents, (Alegría, Carson, Gonclaves, & Keefe, 2011) and less likely to complete treatment for these problems (Mulatu, Godette, Randolph, Leonard, & Pettibone, 2009). Some explanations for the treatment discrepancies include socioeconomically-based considerations, such as differential access to resources and disruptions in the family ecology (Alegría, Green, McLaughlin, & Loder, 2015) and delivery of services that may not be culturally informed and focused on the unique stressors impacting Hispanic/Latinx adolescents (Santisteban, Abalo, & Mena, 2013). Additionally, Hispanic/Latinx adolescents who enter treatment have higher likelihoods of having cooccurring mental health problems which may cause challenges in treatment (Chisolm, Mulatu, & Brown, 2009). When Hispanic/Latinx adolescents develop externalizing problems, they enter social institutions that do not seem to respond in ways that enhance their well-being. Rather, the existing social forces seem to have effects of maintaining or potentially worsening externalizing problems by disrupting the family unit or disconnecting these individuals from treatment.

Ecological approaches. It is important to consider the role that social systems have in the development and maintenance of externalizing problems within Hispanic/Latinx adolescents, given the oppressive forces that exist within social structures. Theoretical perspectives applied in research of this population reflect the

systemic nature of externalizing problems. Specifically, work from Urie Bronfenbrenner (e.g., Bronfenbrenner, 1979; Bronfenbrenner & Ceci, 1994) is often cited as a primary source or as a theoretical component that can be integrated into understanding Hispanic/Latinx adolescent problem behaviors (Coatsworth, Pantin, & Szapocznik, 2002), or specifically for substance use (Cox, Burr, Blow, & Parra Cardona, 2011; Prado, Szapocznik, Maldonado-Molina, Schwartz, & Pantin, 2008; Szapocznik & Coatsworth, 1999) and HIV-risk behaviors (Pantin, Schwartz, Sullivan, Prado, & Szapocznik, 2004). The use of Bronfenbrenner's theory has been said to provide lenses that allow various fields of research to "come together to form a more coherent explanation of an enormously complex phenomenon" (p. 20, Cox et al., 2011), suggesting that ecological approaches are complementary to the multi-layered origins of externalizing problems within Hispanic/Latinx adolescents.

Applications of Bronfenbrenner's theory. Data-driven applications of ecological approaches and perspectives have also pointed to systemic origins of externalizing problems within Hispanic/Latinx adolescents. In an investigation of Hispanic/Latinx individuals aged 14-22, Eamon and Mulder (2005) found that the relation between poverty and antisocial behavior was mediated by peer pressure and neighborhood quality, in addition to finding various aspects of parenting that were directly associated with antisocial behavior. The implications of this study are that some social processes are directly associated with externalizing problems (e.g., parenting, peer pressure, neighborhood quality) and broader social problems (e.g., poverty) show indirect associations with externalizing problems.

Likewise, Bacio and colleagues (2015) examined substance use within Hispanic/Latinx 8th graders and identified multiple relationships involving mediation in a structural equation model. One effect demonstrated that dimensions of family functioning (e.g., parental involvement, communication) mediated the relationship between parent education and adolescent substance use. Also, perceptions of peers' substance use were found to mediate the relationship between qualities of the school (i.e., school socioeconomic status and adolescent's belongingness in school) and substance use. This study also shows how variables representing distal processes (e.g., school qualities, parent's background) have indirect associations, whereas there are direct associations in phenomenon involving the adolescent (e.g., parent-child relationship).

Prado and colleagues (2010) also conducted a multivariate structural equation model and found that adolescent substance use behavior and sexual activity were directly associated with the adolescent's perceptions of each of these respective behaviors. That is, adolescents were more likely to use substances when they believed their peers used substances and more likely to be sexually active when believing their peers were sexually active. Additionally, these researchers conducted analyses and identified complex indirect effects that suggest "trickle-down" effects. For example, one effect linked a chain of variables to show an indirect association from parental cultural views to aspects of family functioning, to the adolescent's academic functioning, to perceptions of peer substance use, and finally to the adolescent's substance use (Prado et al., 2010). Again, the research describes multiple layers of influence by identifying variables representing various social processes and demonstrating indirect and direct associations.

Another study demonstrated noteworthy findings when examining externalizing behaviors within Hispanic/Latina adolescent girls (Coatsworth et al., 2000). These researchers found that externalizing problems were directly associated with domains of family functioning and peer relationships. Further, interaction effects were identified that showed how effects between externalizing problems and family conflict differed based on degree of parent acculturation. The nature of the interaction effects suggested that increases in family conflict were associated with increases in externalizing problems and this occurred only with families comprised of parents who resided in the U.S. for longer periods of time. This study resembles the other ecological studies by investigating how social processes are associated with externalizing problems but adds to the approach by investigating how effects vary across contexts (i.e., comparing based on parental immigration history).

Taken together, the ecological approaches demonstrate how various adolescent externalizing problems have direct relations to specific social systems, most often families and peer groups, in ways that are situated within broader social institutions and contexts. The approaches rooted in Bronfenbrenner's theory capture links that form a web of variables in examining the externalizing problems, suggesting that the theory has value in explaining the phenomenon

Bronfenbrenner's bioecological theory. The nature and form of Bronfenbrenner's theory has changed from its early version (e.g., Bronfenbrenner, 1979) to the most recent iteration (Bronfenbrenner, 2005; for details on the progression of the theory, see Rosa & Tudge, 2013). Often, researchers emphasize or rely on aspects of earlier writings from Bronfenbrenner, omitting constructs from the recent version (Tudge,

Mokrova, Hatfield, & Karnik, 2009; Tudge et al., 2016). Briefly, the early form of the theory describes contexts as progressively broader “nested systems,” from microsystems to exosystems, mesosystems, and macrosystems (see Figure 1.a; Bronfenbrenner, 1979). This early form of the theory describes how social processes with increasing levels of complexity have an influence on development, typically with effects that “trickle down” from more distal influences into more direct influences.

The later version of the theory has been coined the bioecological theory and the Process, Person, Context, Time (PPCT) model (Bronfenbrenner, 2005). This version expands upon the context-focused model by incorporating additional components that influence a person’s development. The mature form of the theory can be illustrated with a “networked” conceptualization (see Figure 1.b.; adapted from Neal & Neal, 2013). The mature version of the theory recognizes other individuals within the developing person’s life and suggests that development takes place through *proximal processes*, which are the bidirectional interactions between the developing person and the others within their environment. Further, the theory outlines that there can be characteristics of the *person* and qualities of the *context* that interact with proximal processes in the effects on development. Rather than focusing on how effects “trickle-down” from all possible influences, there is an emphasis on recognizing direct influences (i.e., proximal processes) and consideration is given to variables that shape these direct influences. In summary, there have been substantial changes in Bronfenbrenner’s theory since its inception and various interpretations of Bronfenbrenner’s theory are applied in research.

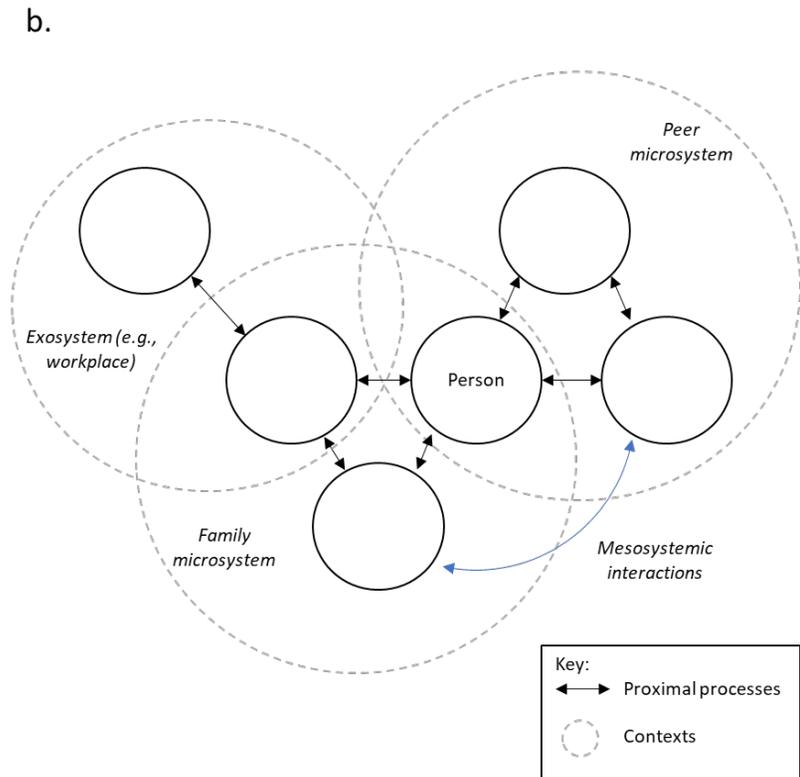
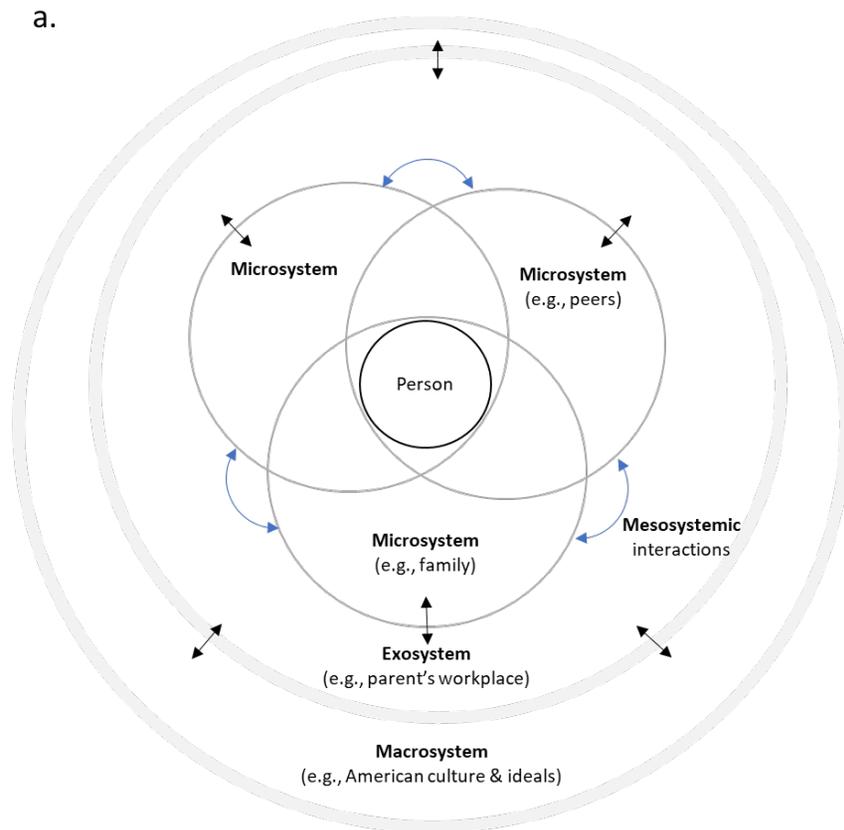


Figure 1. Visual representations of Bronfenbrenner's theory: (a) *nested systems* framework and (b) *process, person, context, time* model.

Notably, the ecological approaches that have been applied to externalizing problems within Hispanic/Latinx adolescents (Bacio et al., 2015; Coatsworth et al., 2000; Eamon & Mulder, 2005; Prado et al., 2010) apply the earlier forms of Bronfenbrenner's theory. Tudge and colleagues (2009; 2016) suggest the reliance on earlier forms of the theory is likely when researchers emphasize the "nested systems" (e.g., microsystem, mesosystem, exosystem, macrosystem) and when there is little to no description of core constructs of the PPCT model (e.g., "proximal processes"). These critiques fit with the aforementioned studies that are focused on understanding externalizing problems within Hispanic/Latinx adolescents. The ecological approaches that have been applied to understanding Hispanic/Latinx externalizing problems within adolescents do not claim to be adhering to the more recently developed bioecological approach (Bacio et al., 2015; Coatsworth et al., 2000; Eamon & Mulder, 2005; Prado et al., 2010), and it is my intent to recognize that the approaches taken by these researchers have merit in their own right. However, there does not appear to be any research that has been conducted in the area of Hispanic/Latinx externalizing problems which applies conceptualizations from the mature form of Bronfenbrenner's bioecological theory (for a review, see: Tudge et al., 2009; Tudge et al., 2016).

The present study aimed to expand upon the current efforts in understanding externalizing problems within Hispanic/Latinx individuals by applying conceptualizations of the most recent version of Bronfenbrenner's theory. Proximal processes were emphasized as the driving forces of development and consisted of the ongoing interactions between the adolescent and another person within the environment. The influence of proximal processes was also compared in ways that recognize the

context in which the adolescent exists in. Conceptualizations from Bronfenbrenner's bioecological theory were applied by examining how variables that fit with specific components of the PPCT model relate and interact with externalizing problems.

Statement of the Problem

Adolescent risk-taking behaviors cause harm to the individuals who engage in them, to others in society, and can largely be understood as externalizing problems that exist as a dimension of psychopathology. Externalizing problems have features rooted in the individual, with the range from genetics to observed behaviors (Caspi et al., 2014; Kotov et al., 2017), yet socio-contextual phenomena seem to underlie disparities observed within Hispanic/Latinx populations (Singer, 2000). Further understanding externalizing problems within Hispanic/Latinx adolescents can provide the means to help address: a) exposure to systemic & individual-level oppressive forces that contribute to the development of externalizing problems, b) disproportionate rates of externalizing problems (e.g., substance use), and c) relatively heightened consequences of having externalizing problems. The multilayered determinants of externalizing problems demand a framework that recognize biopsychosocial processes involved with their development. The latest form of Bronfenbrenner's theory, the bioecological theory or PPCT model (Bronfenbrenner, 2005), has constructs that correspond to biopsychosocial processes involved with development. Yet, aspects of the most recent version of this theory have not been applied to understanding externalizing problems within Hispanic/Latinx adolescents, despite common reference to Bronfenbrenner's writing. The overarching purpose of the proposed study was to further the understanding of externalizing problems within Hispanic/Latinx adolescents by using a dimensional

approach to conceptualize externalizing problems and applying constructs of Bronfenbrenner's bioecological theory (Bronfenbrenner, 2005).

Research Questions

This study was intended to further the field's understanding of externalizing problems within Hispanic/Latinx adolescents. Specifically, this study aimed to address the following questions:

1. Can various externalizing problems of Hispanic/Latinx adolescents be described through a spectrum-based conceptualization of psychopathology?
2. Can constructs fitting with components of Bronfenbrenner's bioecological theory help explain externalizing problems within Hispanic/Latinx adolescents?

CHAPTER TWO: REVIEW OF THE LITERATURE

This study aimed to enhance the understanding of externalizing problems within Hispanic/Latinx adolescents. This was sought through two objectives. A dimensional approach was used to conceptualize externalizing problems. Additionally, strategies were used to examine externalizing problems in ways that incorporate constructs of Bronfenbrenner's bioecological theory (Bronfenbrenner, 2005). This chapter provides details in how the spectrum-based approach was used to examine externalizing problems and describes efforts to incorporate constructs of bioecological theory. Specifically, adolescent-caregiver relationships were recognized as processes that are expected to have a direct relationship with externalizing problems and the context of the adolescent's immigration history was expected to have potential direct and interaction-based influences on externalizing problems.

Externalizing Problems as a Spectrum

Externalizing problems include a spectrum of behavior that exists within a general syndrome of deviance (McGee & Newcomb, 1992; Newcomb, 1995) or problem behaviors (Donovan & Jessor, 1985; Jessor & Jessor, 1977). These research programs have considered other problems to comprise the syndromes as well, including crime, aggression, risky sexual practices or early sexual debut, academic and social-role dysfunction, and unfavorable attitudes towards social institutions. These research programs largely included adolescent and early adult populations, recognizing that the syndrome of behaviors is typically established during a specific period of development. The notion that higher order processes account for interrelations between multiple deviant or problem behaviors has been supported in prior research (Donovan & Jessor,

1985; Donovan et al., 1988; McGee & Newcomb, 1992) and in recent examinations of psychiatric diagnoses that are characterized by these behaviors (e.g., Caspi et al., 2014; Witkiewitz et al., 2013). Although the behaviors alone may appear to reflect a developmental outcome, examining the problems at a behavioral level may lead to difficulties in conceptualizing the outcome as having biological influences, as expected from bioecological theory (Bronfenbrenner & Ceci, 1994). That is, externalizing behaviors may be observed but there are also related internal processes involving perceptions, self-direction/-control, decision-making, and skill/knowledge development (Bronfenbrenner & Ceci, 1994).

The externalizing spectrum identified in psychopathology research is considered to extend the research that captured the co-occurrences of “problem behaviors” or “deviant behaviors” (Krueger, Markon, Patrick, & Iacono, 2005). The dimensional approaches to psychopathology also emphasize that psychopathology develops through interactions of nature and nurture, often with the goal of identifying linkages that psychopathology has with genetics and biological functioning (e.g., behaviors and symptoms, with thought processes and decision-making, with corresponding brain circuitry and neurons; Caspi et al., 2014; Kotov et al., 2017; Sanislow et al., 2010). The Hierarchical Taxonomy of Psychopathology (HiTOP) is a recently introduced framework of the dimensional structure of psychopathology (Kotov et al., 2017) and describes psychopathology relevant to risk-taking behaviors at multiple levels. The framework proposes that there is a hierarchical structure of psychopathology that is represented by a) a broad spectrum of general psychopathology, b) various sub-spectra and factors that form dimensions (e.g., internalizing and externalizing spectra), c) multiple psychiatric

disorders within each dimension/sub-spectra, d) and symptoms, traits, behaviors, or signs at the lowest levels. HiTOP recognizes problems that are the focus of the present study within an externalizing spectrum that includes substance use disorders, conduct disorder, oppositional defiant disorder, and attention-deficit hyperactivity disorder. When considering measurement of psychopathology, the HiTOP approach (Kotov et al., 2017) advises that broadband dimensions (e.g., externalizing spectra) should be measured with multiple levels of the hierarchy (e.g., at the level of mental disorders; at the level of symptoms). Following a conceptualization that identifies externalizing problems as a phenomenon influenced by nature and nurture, it was hypothesized that externalizing problems can be effectively measured as a spectrum represented by observed symptoms within specific externalizing disorders (i.e., oppositional defiant disorder, conduct disorder, attention-deficit hyperactivity disorder, and substance use disorders).

The present study aimed to measure externalizing problems with an instrument that measures symptoms within specific diagnostic categories. The approach was adapted from Feaster and colleagues (2010), who used latent variable models to represent the externalizing spectrum within a sample comparing adolescent-caregiver dyads of various racial/ethnic identities, including Hispanic/Latinx groups. This article primarily relied upon the Diagnostic Interview Schedule for Children-Predictive Scales (DISC; Lucas et al., 2001) for the latent variable (with four out of six latent variable indicators from the DISC) measuring an externalizing spectrum. This application of the DISC fits with guidelines outlined in representing the HiTOP spectra (Kotov et al., 2017) by consisting of two levels of their proposed hierarchy – at the level of the diagnosis and the level of the symptom – in multiple spectra (i.e., captures multiple forms of externalizing

psychopathology and is capable of measuring internalizing). The present study sought to utilize the DISC by modeling a latent variable of the externalizing spectrum with adolescent-report indicators that capture the total number of symptoms for diagnoses within the spectrum, including oppositional defiant disorder (ODD) and conduct disorder (CD; as demonstrated by Feaster et al., 2010) along with additional diagnoses of substance use disorders and attention-deficit/hyperactivity disorder (ADHD).

Applying Constructs of Bronfenbrenner's Theory

Bioecological theory has a focus on the development of a biological organism (i.e., an individual), with consideration to the dynamic processes between the developing organism and its environment (Bronfenbrenner, 2005). This theory is specified in great detail as the *process, person, context, time* (PPCT) model (Bronfenbrenner & Ceci, 1994; Bronfenbrenner & Morris, 1998). The PPCT model describes how a developmental outcome at the level of a person is shaped by several components, including the *proximal processes, person* characteristics, *context* variables, and *time*. My study intended to apply constructs of bioecological theory by identifying variables that were expected to fit with constructs of proximal processes and context, and by examining these constructs in relation to the developmental outcome of externalizing problems.

Proximal Processes

The construct of proximal processes within the PPCT model refers to the means of development for the specified outcome. Development occurs through exchanges between the developing person and the environment. These exchanges between the individual and the environment are what define proximal processes. In several works by Bronfenbrenner (e.g., Bronfenbrenner, 2001; Bronfenbrenner & Evans, 2000;

Bronfenbrenner & Morris, 1998), proximal processes are defined with a series of propositions.

The first proposition is that development occurs through “progressively more complex reciprocal interaction between an active, evolving biopsychological human organism and the persons, objects, and symbols in its immediate external environment” (p. 996; Bronfenbrenner & Morris, 1998). In the application of the theory, the developmental outcome should be explained by proximal processes. That is, constructs should be included that represent reciprocal ongoing interactions between the developing person and someone (or something) in the person’s environment, and the constructs involving dyadic processes should be examined in relation to the constructs for the developmental outcome.

The second proposition involves how the expected impact of the processes and varies based on characteristics of the processes (Bronfenbrenner & Morris, 1998). It has been described that proximal processes can vary their influence based on duration, frequency, timing and intensity (Bronfenbrenner & Evans, 2000). When distinguishing problematic outcomes versus outcomes of wellness, outcomes of wellness tend to arise through processes characterized by nurturance and support whereas problematic outcomes tend to arise through processes characterized by neglect, strain, or harshness (Bronfenbrenner & Ceci, 1994). Thus, the positive or negative quality of the proximal processes are expected to match the positive or negative character of the developmental outcome when applying the PPCT model. Naturally, there is a tremendous amount of variability in how individuals navigate their environment and how they are affected by the environment, in addition to the complexity from the number of relationships in which

proximal processes can take place. Identifying general positive or negative qualities of processes provides direction about anticipated outcomes, although it is unreasonable to expect these processes to have the same impact across all individuals. Incorporating variables that reflect additional components of the PPCT model is expected provide information about the complexities that cause these exceptions (e.g., aspects of the individual's context).

Adolescent-Caregiver Dynamics. An example of a proximal process involving externalizing problems has been described as “deviancy training” by researchers who happened upon the phenomenon when evaluating the effectiveness of interventions that included peer-group components (Dishion, Ha, & Véronneau, 2012; Dishion, McCord, & Poulin, 1999). The researchers concluded that patterns of deviance are developed through two processes: a) reinforcement that takes place between peers, characterized the receipt of positive attention (e.g., laughter) that occurs when a developing person engages in in a rule-breaking behavior, and b) the sense of meaning or experience of value that the adolescent derives from engaging in the behavior. The process is composed of a social component in terms of the reinforcement as well as an internally developed component with the sense of meaning or value, consistent with the notion of proximal processes and ongoing dynamic exchanges between the individual and the social environment. The line of research offers a rich description within one social context, yet there are additional influences across a variety of social contexts, including families, peers, and social institutions.

The influence of family is central for development in relation to externalizing problems and family influences are thought to have a changing role across time. The

influence of families has been described as cascading, in that families support the development of one aspect of functioning and this growth sets the stage for subsequent area of development (Dodge, Greenberg, Malone, & Conduct Problems Prevention Research Group, 2008; Van Ryzin, Fosco, & Dishion, 2012). A cascading pattern of development is consistent with the notion of proximal processes, in that each progression in the cascade likely reflects an increased level of complexity in dyadic processes between the adolescent and caregiver. Externalizing problems demonstrate relations to family-level variables that suggest a cascading sequence throughout development, such as early childhood exposure to traumatic events, followed by harsh and/or unpredictable discipline during childhood (Dodge et al., 2008). Further, the cascade of family-level effects progresses into adolescence, demonstrated through relations that externalizing problems have with parental monitoring or supervision as well as the quality of the adolescent-caregiver relationship (Dodge et al., 2008; Van Ryzin et al., 2012). The incremental changes of development that occur through the cascade relate to multiple functional capacities, such as self-regulation, establishing healthy relationships, and fulfilling social roles. It is expected that the adolescent-caregiver relationship dynamics form proximal processes that directly relate to the adolescent's externalizing problems. It is also expected that the presence of externalizing problems is disruptive to the developmental cascade that promotes wellness. Thus, it was hypothesized that the adolescent-caregiver dynamic would be significantly associated with the externalizing problems of the adolescent, with expectations of a negative relationship between externalizing problems and the relationship processes (i.e., supportive parenting strategies

and warmer relationships would be associated with lower levels of externalizing problems).

Context

The developmental forces of social context are the most widespread and referenced aspects of Bronfenbrenner's bioecological theory (e.g., Bronfenbrenner, 1977). This portion of the model has received criticism due to the continued use of "nested systems" terminology throughout the progression of the theory (e.g., Bronfenbrenner, 2005), despite changes in the theory that differ from the "nested systems" approach (Rosa & Tudge, 2013). In the following paragraph, I outline the original nested systems approach to describe how the construct of context tends to be applied in research. Subsequently, I discuss how the construct of context was interpreted in my study by using Bronfenbrenner's more recent theoretical developments.

The early works are recognizable by the nested systems model that includes the constructs microsystem, exosystem, mesosystem, and macrosystem. The construct of microsystems refers to the immediate social environment of the developing person, with the family unit as the most central microsystem. Other microsystems involve social structures in which the developing person is an active participant in, such as peer-based social groups, the classroom, and so on. The direct bonds within these microsystems are the pathways in which development takes place (e.g., a parent responds to a child with warmth and sensitivity for the child to develop a sense of security and trust). Another systemic influence is the mesosystem, taking place when there are interactions that span from one microsystem to another microsystem. A common example is when a parent interacts with a teacher with either an outcome of a) the parent changing the nature of

interactions to help the child (e.g., monitoring completion of homework), or b) the teacher changing the nature of interactions to help the child (learning a nonverbal symbol to cue the child). Exosystems are beyond the microsystem, consisting of social structures in which the developing person is not immediately a member. Often, the example is given of the parent's workplace as an exosystem; the workplace is a microsystem for the parent, and not the child, yet the stressors a parent experiences in the workplace may affect the child's development. For example, if a parent comes home from work feeling exhausted and is less responsive to the child. Lastly, macrosystems are described as a collective social structure in which other social processes take place. These macrosystems were thought to explain effects, such as culture, that can be pervasive across large collections of people. Taken together, these systems are proposed to operate in ways that promote or hinder the development of a child, with the potential to enhance development or cause problematic functioning. The nested systems conceptualization describes contexts with various levels of complexity and these contexts are thought to represent social structures that influence a person's development.

I interpret contexts with the more recent descriptions of the PPCT model that do not emphasize the nested systems description. Rather, Bronfenbrenner (2005) has described social contexts as an infinitely complex series of relationships that include the developing person. That is, the developing person's context comprised of infinitely complex "network" of social relationships (Neal & Neal, 2013). Applying the PPCT construct of context involves the examination of a specific social structure (e.g., the family unit) and making comparisons across people who exist within social structures with differing qualities or properties.

Bronfenbrenner has described multiple comparisons of context at a variety of levels of social structures. At a very broad level, the characteristic of the governmental structure was identified to form the basis for comparing national contexts of the U.S.S.R. and the U.S. (Bronfenbrenner, 2005). Bronfenbrenner made efforts to dissect how properties of each national context influenced the individuals' worldviews, the social norms, and the collective social processes. Bronfenbrenner (1979) also defined the "single-parent household" as a context, which is a social structure that may be the smallest possible social structure by being comprised of two individuals (i.e., a parent and a child). The single-parent household became a prototypical social structure, with defining composition of a single parent who is raising a child (or children). In other words, there are "blueprints" that can describe the nature of social structures observed in society (1977), whether they occur at the level of the family unit or the social aggregation of an entire country. Thus, the construct of context can (and will) be applied by making comparisons across social structures that have distinguishable features and unique properties. These aspects of social structures are captured through context variables, such as with categories that represent various "blueprints" that define the features and properties of social structures.

Context of Adolescent's Family Immigration History. I examine the adolescent's family immigration history as a characteristic representing the context component of the PPCT model. Following the classifications of prior research (Cervantes, Padilla, Napper, & Goldbach, 2013), adolescents were categorized in terms of their generation of immigration by examining the birth countries of the adolescent and their caregiver. The first group included pairs including those with both adolescent and

caregiver being immigrants who were born outside of the U.S. (1st-generation), the second group included those with an adolescent born in the U.S. and a parent born outside of the U.S. (2nd-generation), and the third group with both born in the U.S. (3rd-generation or beyond). This classification of the adolescent's immigration history serves as a variable with "blueprints" of the adolescent's context. The variable defines features of the adolescent and their social structure, by specifying the country of birth of the adolescent and their parent. In further detail, the variable captures relations that the adolescent and parent both have to the context of the United States and the country of emigration. The three categories from immigration-based groups have distinct "blueprints" that specify characteristics of the parent-adolescent dyad and their connectedness to countries involving the immigration process.

Adolescents were grouped by their generation of immigration and it was expected that this grouping represents a context that potentially influences externalizing problems, adolescent-caregiver dynamic, or the relations between them. However, these characteristics were not expected to have inherent positive or negative qualities that enhance or impair developmental processes. Thus, exploratory hypotheses were that there may be significant differences between the groups in the levels of externalizing problems, the quality of adolescent-caregiver dynamics, and/or the interrelations between these variables.

It has been suggested that generation of immigrations has meaning for a variety of reasons. Each generational group has been demonstrated to experience distinct forms of stressors and patterns of acculturation (Cervantes et al., 2013). The adolescent's generation of immigration is likely to serve as an indicator of separate developmental

outcomes or developed capacities, represented by an array of culturally salient variables. For example, acculturation has been described as multidimensional by involving practices, values, and identity (Schwartz, Unger, Zamboanga, & Szapocznik, 2010). The process of acculturation can be thought of as the combination of developed outcomes involving a person's attitudes and approach towards both Hispanic/Latinx and American cultures, developed capacities such as language use, or worldviews and belief systems. These outcomes likely develop through proximal processes as well, such as by cohesive bonds within family units contribute to development of values (Szapocznik, Prado, Burlew, Williams, & Santisteban, 2007) or repeated experiences of cultural stressors that relate to mental health difficulties (Cervantes et al., 2013). There are a variety of culturally salient variables that are thought to contribute to adolescent development and these features are often considered in relation to externalizing problems (Cox et al., 2011; Pantin et al., 2004; Prado et al., 2008; Szapocznik et al., 2007). However, it was not be feasible to describe the intricacies of how culturally salient variables contribute to the meaning of the adolescent's generation of immigration. Steps were taken to describe the groups with many culturally salient variables as a potential aid for further research, although an in-depth investigation in this area was beyond the scope of the present study.

The Present Study

The present study examined externalizing problems within Hispanic/Latinx adolescents and influences of externalizing problems in ways that apply Bronfenbrenner's bioecological theory (Bronfenbrenner, 2005). The following hypotheses were tested in the study:

h₁) It was hypothesized that a spectrum-based measurement model can represent externalizing problems with indicators consisting of variables totaling the symptoms for specific externalizing disorders (i.e., conduct disorder, oppositional defiant disorder, attention-deficit hyperactivity disorder, and substance use disorders)

h₂) It was hypothesized that the adolescent-caregiver dynamic would be significantly associated with externalizing problems, with expectations of a negative relationship between externalizing problems and qualities of the relationship (i.e., healthier relationships will have lower levels of externalizing problems)

h₃) Exploratory hypotheses were tested to determine if the three immigration-based groups (1st-generation, 2nd-generation, or 3rd- & beyond) showed significant differences in: the quality of adolescent-caregiver dynamics, the levels of externalizing problems, and/or the interrelations between these variables

Taken together, externalizing problems within Hispanic/Latinx adolescents were expected to be captured by interrelated symptoms of diagnoses and to be associated with the adolescent-caregiver relationship in ways that may interact with the adolescent's generation of immigration.

CHAPTER THREE: METHOD

Participants

The present study was conducted with existing data from four NIH-funded studies involving Culturally Informed and Flexible Family-Based Treatment for Adolescents (CIFFTA), including CIFFTA-NIDA, CIFFTA-P, CA-CIFFTA, and CIFFTA-NIDA-II. All CIFFTA studies used equivalent measures for the primary constructs of interest in the proposed study and data was combined across these studies for the primary analyses. Each of the CIFFTA studies used either equivalent or similar measures for other constructs relevant to describing the sample and there was a capacity to partially aggregate data that was used for descriptive purposes. Each study included a baseline assessment of functioning for participants. Only data from the baseline assessment was utilized in the present study. Details and characteristics of each sample are described below.

CIFFTA-NIDA

The original CIFFTA study funded by NIDA had three separate aims, with each aim consisting of separate but very similar samples. CIFFTA-NIDA (Aim 1) aimed to investigate the role of immigration and acculturation-related stressors in relation to domains of family functioning to inform therapeutic mechanisms of change. Participants were adolescent-caregiver dyads and recruited from an addiction receiving facility where adolescents were admitted to be assessed for substance use problems and dyads were referred to treatment in the community. Inclusion criteria of the study was determined based on the adolescent and included meeting criteria for substance use disorder, being 14-17 years old, and living with a Hispanic/Latino parent or grandparent. The 110

adolescent participants were 35% girls, on average 15.6 years old ($SD = 1.96$), and 34% foreign-born. The study was approved by University of Miami's Institutional Review Board.

CIFFTA-NIDA also aimed to pilot (Aim 2) and test (Aim 3) a family-based treatment for substance use and problem behaviors within Hispanic/Latinx adolescents. Participants were adolescent-caregiver dyads who were randomized into CIFFTA or traditional family therapy. Inclusion criteria of the study was determined based on the adolescent and included meeting criteria for substance abuse disorder, being 14-17 years old, and having a Hispanic/Latino parent or guardian who came to the U.S. from a Spanish-speaking country. Referrals were from a juvenile justice services diversion program. Aim 2 included 14 participants and Aim 3 included 25 participants. The study was approved by University of Miami's Institutional Review Board. Additional information about Aim 3 can be found in an article providing preliminary results (Santisteban, Mena, & McCabe, 2011) and further information about the combined sample (Aims 1, 2, & 3) can be found in a secondary data analysis (Gattamorta, Varela, McCabe, Mena, & Santisteban, 2017).

CIFFTA-P

CIFFTA-P (Prevention) aimed to provide early intervention and preventative, family-based treatment for issues related to substance use and risky sexual behavior among young adolescents who demonstrated risk. Participants were adolescent-caregiver dyads who were randomized into CIFFTA or a community treatment-as-usual. Inclusion criteria of the study was determined based on the adolescent and included being 11-14 years-old, having two or more mental health diagnoses (out of Conduct Disorder,

Attention-Deficit/Hyperactivity Disorder, or any depressive disorder), and/or family conflict. Participants were referred from community sources, including schools, treatment agencies, and civil citation programs. The 200 adolescent participants were 39% girls, 12.5 years-old on average ($SD = 1.05$), 36% foreign-born with these individuals having lived in the U.S. for 10.2 years on average ($SD = 4.10$). The study was approved by University of Miami's Institutional Review Board. Further information about the sample can be found within a manuscript that has been submitted for publication (Santisteban, Mena, McCabe, Abalo, & Puccinelli, 2019).

Computer Assisted (CA)-CIFFTA

CA-CIFFTA aimed to treat substance use and problem behaviors of adolescents by providing family-based treatment that included a computer-assisted delivery format. Participants were randomized into CA-CIFFTA or a waitlist/delayed delivery of CA-CIFFTA. Inclusion criteria of the study was being 12-15 years old, an adolescent identifying as Black and Non-Hispanic or as Hispanic, having a caregiver to participate in the treatment and assessments, and the adolescent having at least two reported behavioral or mental health concerns (e.g., adolescent depression or conduct problems, or family conflict). Referrals were primarily from school counselors and other community agencies. The 80 adolescent participants were 44% girls, on average 13.58 years old ($SD = 1.17$), and 80% Hispanic/Latino and 20% Black Non-Hispanic. Due to the focus of the proposed study, only the 64 adolescent participants who identified as Hispanic/Latino were included in the study. The study was approved by University of Miami's Institutional Review Board. Additional details of the study can be found in a previously published study (Santisteban, Czaja, Nair, Mena, & Tulloch, 2017).

CIFFTA-NIDA-II

CIFFTA-NIDA-II aimed to treat substance use and problem behaviors of adolescents by providing family-based treatment. Participants were adolescent-caregiver dyads who were randomized into CIFFTA or traditional family therapy. Inclusion criteria of the study was determined based on the adolescent and included meeting criteria for substance use disorder, being 14-17 years old, and living with a Hispanic/Latino parent or grandparent. Referrals were from juvenile justice services, school counselors, and other community agencies. The 191 adolescent participants were 21% girls, on average 15.9 years old ($SD = 1.07$), and 25% foreign-born with these individuals living outside of the U.S. for an average of 9.61 years ($SD = 4.80$). The study was approved by University of Miami's Institutional Review Board. Further information about the sample can be found within a manuscript in preparation for publication (Santisteban, Mena, Zopluoglu, McCabe, & Stanforth, 2019) or within articles involving secondary analyses of these data (Gattamorta, Mena, Ainsley, & Santisteban, 2017; Stanforth, McCabe, Mena, & Santisteban, 2016).

Summary

The combined sample included 627 adolescent-caregiver dyads. The combined sample consisted of adolescents who identified as Hispanic and/or Latino, were aged between 11 to 17 years old, and demonstrated a range of mental and behavioral problems (e.g., ranging from behavioral concerns to multiple diagnoses involving mental health or substance use). The dyads included those who were recruited to participate in a preventative or primary intervention, or who were identified within a hospital as having mental health or behavioral concerns.

Measures

The measures used in the study provide descriptive information about the sample and allowed the primary analyses to be conducted. Constructs of interest are outlined in the following sections. This includes measures that capture each construct and descriptions about how each variable was used in analyses. Measures were administered across all CIFFTA studies, unless otherwise indicated.

Externalizing Problems

The Diagnostic Interview Schedule for Children – Predictive Scales (DISC; Lucas et al., 2001) were administered to adolescents to evaluate symptoms of participants and the measure assesses various DSM diagnoses (e.g., Major Depressive Disorder, Oppositional Defiant Disorder [ODD], Conduct Disorder [CD]). Items from the attention-deficit/hyperactivity disorder (ADHD), ODD, and CD scales were summed for a total score for each of these scales. Items from all scales involving substance use were summed into one scale (Alcohol, Marijuana, and Other substance). Items on the DISC are dichotomous in nature and the content reflects symptoms for each diagnosis. The ADHD, ODD, CD, and Substance scales have 6, 7, 8, and 15 items, respectively.

Adolescent-Caregiver Dynamics

The Parenting Practices Questionnaire (Gorman-Smith, Tolan, Zelli, & Huesmann, 1996) was administered to adolescents and the measure assesses the presence of a variety of parenting behaviors. Specifically, the items have items asking about the most recent time a parenting behavior has occurred (e.g., “never” to “today”) or how often an event occurs (e.g., “never” to “always”). The measure includes various

subscales including a subscale for positive parenting and another for extent of involvement, though the total scale score can also be used and was in the present study.

The Inventory of Parent & Peer Attachment (Armsden & Greenberg, 1987) was administered to adolescents and assesses the quality of aspects of the relationship between the parent and adolescent. Items include statements such as “My mother/father accepts me as I am” and “My mother/father has problems of her/his own, so I don’t bother her/him with mine” along with responses on a range (“Almost never or never true” to Almost always or always true”). The measure includes subscales for Communication, Trust, and Alienation, though a total scale score can be used to capture overall attachment, and this was used in the present study.

Demographics

Multiple aspects of participants’ identities were also assessed with demographics questionnaires within each study. Data of gender was obtained for both the adolescent and the caregiver and were measured as dichotomous variables (man vs. woman; adolescent boy vs. adolescent girl). Data of the age of adolescents and caregivers was gathered and is reported in years. Additionally, caregiver marital status was assessed and included the following categories: divorced, in a relationship (not legally married), married, separated, single, or widowed.

Data were obtained involving the immigration history of the parent and the adolescent. Specifically, whether the adolescent and parent were born in the United states or another country. Data representing parents or adolescents individually is presented with a dichotomous variable (i.e., foreign born or U.S. born). Participants were assigned to groups based on the adolescent and caregiver, as 1st-generation, 2nd-

generation, or 3rd-generation and beyond, when immigration occurred during adolescent's lifetime, parent's lifetime, or beyond either's lifetime (e.g., Cervantes et al., 2013).

Additionally, data were gathered on the duration of time (in years) in which the foreign-born adolescents and caregivers have resided within the United States.

Cultural Orientation

The bidimensional acculturation scale (Marin & Gamba, 1996) was administered to adolescents to assess cultural orientation. This measure was administered in CIFFTA-P, CA-CIFFTA, and CIFFTA-NIDA-II. The constructs of the scale involve degree of identification with a Hispanic/Latino dimension of culture and with an American dimension of culture. Item content is primarily focused on language, such as use of English and Spanish language, with responses on a 5-point range. The scale consists of two subscales, English and Spanish.

The bicultural involvement scale (Szapocznik, Kurtines, & Fernandez, 1980) was also used to assess cultural orientation and this scale was administered to adolescents within the CIFFTA-NIDA study. This scale also has item content primarily focused on language, has items in a Likert format, and has subscales that reflect dimensions for Americanism and Hispanicism.

Hispanic/Latinx Stressors

The Hispanic Stress Inventory – Immigrant version (HSI-I; Cervantes, Padilla, & De Snyder, 1990) was administered to assess experiences and impact of stressors thought to affect Hispanic/Latinx individuals. The HSI-I was administered to adolescents in CIFFTA-NIDA, CIFFTA-P, and CA-CIFFTA; the adolescents in CIFFTA-NIDA-II did not complete the HSI-I. Items are constructed with a dichotomous option involving

whether the individual experienced a stressor and a Likert-type response that indicates the severity of the impact from the stressor. A composite variable was created by taking the average of Likert responses (and treating the value as the lowest option when there was no stressor endorsed). The subscale that was administered to the adolescents included the Cultural/Family Conflict subscale.

The Hispanic Stress Inventory – Adolescent version (HSI-A; Cervantes, Fisher, Córdova, & Napper, 2012) was used to assess the presence stressors thought to be experienced within Hispanic/Latinx adolescents. The HSI-A was only administered to adolescents within the CIFFTA-NIDA-II sample. Items in this version are also constructed with a dichotomous option involving whether the adolescent experienced the stressor and a Likert-type response that indicates the severity of the impact from the stressor. Composite variables were created by taking the average of Likert responses (and treating the value as the lowest option when there was no stressor endorsed). The scale is broken down into the following subscales: Family Economic Stress (with item content including “Family could not afford medications”), Cultural and Educational Stress (“People were suspicious of me when I spoke Spanish”), Acculturation Gap Stress (“My parents were too traditional”), Immigration-Related Stress (“Left close friends in home country”), Discrimination Stress (“Other students made racist comments”), Family Immigration (“Family afraid of getting caught by immigration officials”), and Community and Gang-Related Stress (“Saw drive-by shooting”), and Family and Drug-related Stress (“There is violence in the family”). Data collection for the existing data started prior to the final version of the HSI-A was published; not all items on the HSI-A were included in the study and descriptions are provided where items differ.

Analyses

Data Screening Procedures

Efforts were made to preserve descriptive measures in their original form and brief screening procedures were used to examine performance of these measures. The measures that were examined with these strategies included the BAS, BIS, HSI-A, and HSI. The screening efforts included analyses to examine Cronbach's alpha and item-level performance (e.g., value of Cronbach's alpha with item removed, item-total correlation). Modifications were made if there were indications of poor performance at the level of the item. Modifications were made in an iterative manner (i.e., removing one item at a time), when applicable. Changes are summarized and conclusions of scale/subscale inadequacy are reported.

Scales and subscales that were used in the primary analyses followed different data screening procedures. Specifically, more thorough data screening took place for the PPQ, IPPA, and DISC scales. The screening procedures attempted to demonstrate adequacy in item-level performance and to demonstrate the hypothesized unidimensional structure of each scale. Six separate exploratory factor analysis models were conducted to examine performance of each composite variable expected to be included in the primary analyses, or for the PPQ, IPPA, and DISC subscales. Factor analyses were conducted with principal axis factoring and varimax rotation (when multiple factors were included in the solution). Exploratory factor analyses for DISC subscales were conducted with correlation data based on tetrachoric correlation coefficients due to the dichotomous nature of the items. Tetrachoric correlations were estimated using Mplus. Factor solutions were evaluated based on overall scale performance and performance of

items. Specifically, overall scale performance was evaluated by visually examining the scree plot and examining the total variance explained by the factor solution (Costello & Osborne, 2005). Item-level performance was evaluated based on the proportion of shared variance between the item and the factor, with a “poor” loading of .32 indicating 10% of shared variance, a “fair” loading of .45 indicating 20% shared variance, a “good” loading of .55 indicating 30% shared variance, a “very good” loading of .63 indicating 40% shared variance, and an “excellent” loading of .71 indicating 50% shared variance (Comrey & Lee, 1992). Items were considered for removal that did not have at least a “poor” loading and consideration was made to remove items if the solution did not explain a majority of the variance. Initial analyses were conducted with a one-factor solution. Solutions with additional factors were specified if visual examination of scree plot suggested a multidimensional structure and if overall scale performance appeared to be inadequate (i.e., scale did not explain a majority of variance, numerous underperforming items). Underperforming scales that could not be improved were removed from the analyses and another expected option was to create scales based on alternate factor solutions (if results could be theoretically justified). The solutions and associated results of each scale and subscale are described (i.e., scree plot, variance explained, range of item loadings), as are efforts in improving the quality of the solution (e.g., removal of items, specification of additional factor).

Descriptive Statistics

Descriptive statistics were used to provide meaningful information about the groups defined by adolescent’s immigration history (i.e., 1st-, 2nd-, or 3rd-generation and beyond). The adolescent’s generation of immigration was recognized as a context-level

variable that was used in the primary analyses. Yet, there are complex influences that are likely not described by the group classification. Thus, overall and within-group descriptive statistics were provided for variables that may account for complex interrelations between externalizing problems and adolescent's generation of immigration. The information provided through the descriptive statistics was meant to illustrate culturally salient characteristics and areas of functioning related to generation of immigration. I intend to highlight areas for future research by providing descriptive statistics for these variables. Statistics are reported based on data from all possible participants and the results are reported within subsamples when data are not consistent across CIFFTA samples.

Descriptive statistics included the mean and standard deviation for continuous variables or the percentage and frequency for categorical variables. These statistics are reported for the total sample and within each group (i.e., 1st-generation adolescents, 2nd-generation adolescents, and 3rd-generation and beyond). Variables included the birth country of adolescents and caregivers (i.e., U.S. born or foreign-born) as well as the years lived within the U.S. Additionally, descriptive statistics are provided for: preferred language of the adolescent and caregiver; adolescent-reported levels of Americanism, Hispanicism, and culture-related stressors (Family Economic Stress, Acculturation-Gap Stress, Immigration-Related Stress, Family-Immigration Stress, Community & Gang-Related Stress, Family and Drug-Related Stress, & Cultural/Family Conflict). Additionally, demographic variables are described including the genders of the adolescent and caregiver, parental marital status, and ages of adolescent and caregiver.

Primary Analyses

Structural equation modeling was used to examine externalizing problems and to examine aspects of the adolescent-caregiver relationship that were expected to be related to externalizing problems across the immigration-based groups. For the analyses, multigroup models were fit to the data to test invariance across assigned groups, based on procedures outlined by Thompson and Green (2013) and strategies described by Kline (2011). The analyses were separated into two stages. The first stage included tests of measurement invariance across the groups and the second stage involved tests of structural invariance across groups. The theorized model was fit (see Figure 2) and focal parameters of the model are also reported in tabular format.

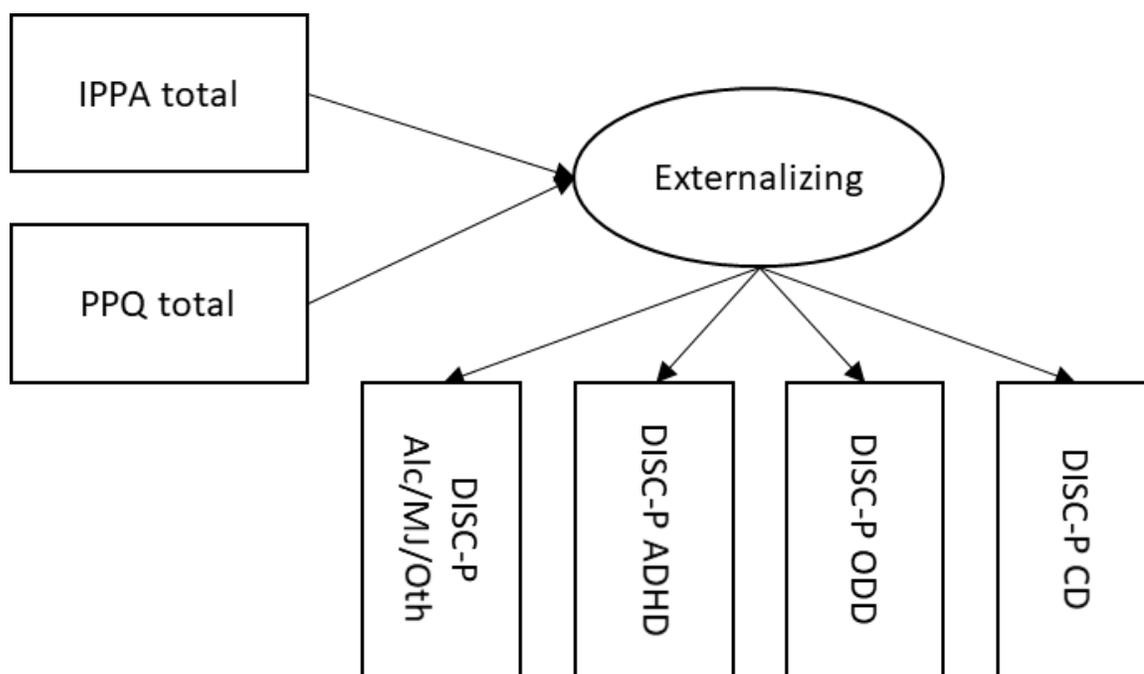


Figure 2. Theoretical model of adolescent-caregiver relations and externalizing problems.

Model fit. Multiple fit indices were examined to determine overall adequacy of model fit and relative fit when comparing multiple models. Overall indices of fit that are reported include the chi-square goodness-of-fit test, root-mean-square-error-approximation (RMSEA), comparative fit index (CFI), and standardized root mean squared residual (SRMR). A model was considered to have strong fit with a non-significant chi-square, a CFI > .97, RMSEA < .05, and a SRMR < .10 (Schermelleh-Engel, Moosbrugger, & Müller, 2003; Thompson & Green, 2013). A model was considered to have adequate fit and was retained with a CFI > .95 and a RMSEA < .09 (Hu & Bentler, 1999; Schermelleh-Engel, Moosbrugger, & Müller, 2003). Relative fit indices were used to determine comparative fit between models, or the significance of change in the model (Cheung & Rensvold, 2002). Specifically, relative model fit was examined by testing a change in chi-square, in which a significant test would indicate improvement in the model (Thompson & Green, 2013), and by evaluating a change in CFI, in which a change of .01 or greater would be considered meaningful (Cheung & Rensvold, 2002). The null hypothesis of invariance was retained if either criterion was met (a non-significant chi-square test and a $\Delta\text{CFI} < .01$) and models were interpreted as meaningfully different if both criteria were not met (i.e., a significant chi-square and a $\Delta\text{CFI} \geq .01$).

Measurement invariance. The initial model specified complete model invariance across groups with the model presented in Figure 2. That is, all parameters of the model were fixed to equality across groups. Indications of model misfit were interpreted as a need to specify model invariance by freeing parameters across groups.

Model misfit was examined by freeing parameters that maintained a model of strong measurement invariance. Strong measurement invariance was defined as having parameters fixed across groups that include, a) factor loadings (representing the change in indicators relative to the change in the latent factor) and b) indicator intercepts (the scale of the indicator relative to the scale of the latent factor); while freely estimating the a) residual variances for indicators, b) factor variance, and c) factor mean (Thompson & Green, 2013). The strategy of gradually freeing parameters in the model (Kline, 2011) was taken in the present study due to the previously demonstrated fit with a more complex model (Feaster et al., 2010) and limited interest in these parameters. The first stage would be considered complete if the model demonstrated adequate fit with these specifications. In the event that the initial model did not demonstrate strong measurement invariance, further steps were planned to identify source(s) of misfit by incorporating additional parameters aimed at improving fit

Potential misfit in scalar invariance was considered as a next step to further identify sources of misfit within the model. Modification indices were used to explore if there would be significant improvement in the model by freeing parameters to estimate indicator intercepts across groups. Additional parameters were expected to be freed until the model no longer improved significantly. The first stage was expected to be complete if the model demonstrated adequate fit with these specifications. Further steps were planned to improve misfit by incorporating additional parameters identify source(s) of misfit if modification indices for indicator intercepts are not deemed necessary or if the model remained inadequate after incorporating modification indices.

Potential misfit in metric invariance was considered as a next step if there was a need to further identify sources of misfit within the model. Modification indices were examined to explore if there would be significant improvement in the model by freeing parameters to estimate factor loadings across groups. Additional parameters were planned to be incorporated until the model no longer improves significantly. The analysis was expected to enter the next stage of examining the observed variable means, factor mean, and variances/covariances if the model demonstrated adequate fit.

The minimum criteria for between-group comparisons of means and relations between factors was for at least one factor loading per factor to be equivalent across groups (Thompson & Green, 2013). However, it was recognized that solutions under this condition should be interpreted with caution because significant of effects within the model can differ based on the indicator that is fixed to one in the unstandardized factor solution, despite equivalence of model fit indices across solutions. This issue does not arise when more than one factor loading can be fixed across groups. Thus, it was planned that the primary analysis would continue with caution if at least one indicator per factor was fixed across groups.

Structural invariance. The structural aspects of the model included means for latent factor, the observed variable covariances, regression coefficients, and variances. Steps were taken to reduce the complexity of the model to evaluate sources of invariance (Thompson & Green, 2013; Kline, 2011). The methods of evaluating relative model fit that were described in the first stage were used in this stage; multiple indices of fit were evaluated when determining model fit and misfit. The analyses allowed for the following questions to be tested: a) do the observed variable means and/or factor mean differ across

groups?; b) do the observed variable/factor variances differ across groups?; and c) do the observed variables' covariance or regression coefficients differ across groups?

The parameters to test the variances, covariance, and regression coefficients were examined first. Specifically, the solution identified in the previous stage was expected to be fit with specifications to fix parameters to equality across groups for the variances, covariance, and regression coefficients. Relative model fit was expected to be examined and the parsimonious model was planned to be retained with a lack of evidence of differential fit. Alternatively, modification indices were expected to be examined to identify if model fit would be significantly improved by freeing parameters across groups for variances, covariance, and regression coefficients. The model identified as having fit and being most parsimonious was expected to be utilized to examine the factor means across the groups.

There were plans to examine the observed variable and factor means with a similar procedure of initially reducing complexity of the model. The model that was identified with procedures described were expected to be fit with constraints in parameters for the means of the observed variable and factor to be fixed to equality across groups. Relative model fit was expected to be examined, and the parsimonious model was expected to be retained with a lack of evidence for differential fit. Alternatively, modification indices were expected to be examined to identify if model fit would be significantly improved by freely estimating observed variable and factor means across groups. The model that was identified after these steps was identified as the final model and the parameters from this model were interpreted.

Summary. The multigroup structural equation model allowed for the hypotheses of the study to be tested and research questions to be answered. Externalizing problems was examined as a spectrum by examining the adequacy of the latent variable model represented by diagnoses and symptoms of externalizing problems. Constructs of bioecological theory are incorporated by examining associations of proximal processes (i.e., regression coefficients involving adolescent-caregiver dynamics and externalizing problems) and examining context-based interactions (exploring differences across groups).

CHAPTER FOUR: RESULTS

The combination of all participants across the CIFFTA studies consisted of 627 participants. The CIFFTA-NIDA Aim 1 sample consisted of 118 participants and represented 19% of the overall sample. The CIFFTA-NIDA Aim 2 sample consisted of 13 participants and comprised 2% of the overall sample. The CIFFTA-NIDA Aim 3 sample consisted of 30 participants and comprised 5% of the overall sample. The CIFFTA-P sample consisted of 195 participants and comprised 31% of the overall sample. The CA-CIFFTA sample consisted of 80 participants and comprised 13% of the overall sample. The CIFFTA-NIDA-II sample consisted of 191 participants and comprised 31% of the overall sample.

Descriptive Statistics

Immigration-related demographics. Adolescents in the combined sample were compared across the immigration-based groups that were used in the primary analyses. Table 1 includes details for descriptive statistics for the combined sample and for characteristics of each group. The combined sample included a total of 627 participants.

Within the overall sample, there were 31% ($n = 195$) who were 1st generation immigrants, 56% ($n = 351$) who were 2nd generation immigrants, and 13% ($n = 81$) who either were 3rd generation immigrants or had a more distant family-immigration history. There were 69% ($n = 436$) adolescents who were born within the U.S. The remaining adolescents, whom were born in a country other than the U.S., lived within the U.S. for an average of 7.83 years ($SD = 4.48$).

There were 13% ($n = 81$) of caregivers who were born in the U.S. Caregivers who were born outside of the U.S. lived within the U.S. for an average of 19.58 years (SD

= 11.38). Parents of 1st generation immigrant adolescents lived in the U.S. for an average of 9.10 years ($SD = 6.91$) and parents of 2nd generation immigrant adolescents lived in the U.S. for an average of 25.24 years ($SD = 9.06$).

Of adolescents given three options of preferred language (English, Spanish, or both), most adolescents preferred English (74%), 7% preferred Spanish, and 19% preferred both. Most adolescents preferred English within each immigration group (see Table 1 for additional details). Of the adolescents given two options for preferred language (English or Spanish), 12% indicated a preference for Spanish. There were 32% of 1st generation immigrant adolescents who preferred Spanish and 1% of 2nd generation immigrant adolescents who preferred Spanish.

Most caregivers preferred Spanish (60%), 28% preferred English, and 12% preferred both. Nearly all caregivers of 1st-generation immigrant adolescents preferred Spanish (94%), caregivers of 2nd-generation immigrant adolescents also mostly preferred Spanish (61%), and caregivers of 3rd generation immigrant adolescents (or beyond) mostly preferred English (80%). Additional details on caregiver's preferred language are presented in Table 1.

Additional demographics. Adolescents were mostly boys in the overall sample, with only 33% who were girls across the sample. There were similar gender proportions within each immigration-based group. On average, adolescents were 14.60 years old ($SD = 1.98$) and age was relatively consistent within each group as well.

Caregivers that were participating in the study were mostly women, with only 17% who were men across the sample. There were similar gender proportions within each immigration-based group. On average, caregivers were 43.09 years old ($SD = 7.50$)

and caregiver age was relatively consistent within each group as well. In the overall sample, caregivers were mostly married (36%) or divorced (35%), fewer participants were single/not married (25%), and very few had other marital statuses (e.g., widowed; 4%). Details of caregiver marital status within each group are presented within the table but will not be described.

Table 1

Descriptive Statistics of Adolescent Immigration Groups

Scale/variable	Adolescent generation of immigration			Overall sample (<i>n</i> = 627)
	1 st -gen. 31% (<i>n</i> = 195)	2 nd -gen. 56% (<i>n</i> = 351)	3 rd -gen. (& beyond) 13% (<i>n</i> = 81)	
Key:				
• Subscales/categories	Descriptive statistics			
U.S. Born (Adolescent [A])	0% (<i>n</i> = 0)	100% (351)	100% (81)	69% (<i>n</i> = 436)
Years in U.S. (A)	7.83 (4.48)	-	-	7.83 (4.48)
U.S. Born (Caregiver [C])	0% (<i>n</i> = 0)	0% (<i>n</i> = 0)	100% (81)	13% (81)
Years in U.S. (C)	9.10 (6.91)	25.24 (9.06)	-	19.58 (11.38)
Preferred language (A)				
• English	54% (73)	80% (199)	90% (73)	74% (349)
• Spanish	21% (28)	1% (3)	1% (1)	7% (32)
• Both	25% (34)	19% (48)	9% (7)	19% (90)
Preferred Spanish (NIDA-1) (A)	32% (18)	1% (1)	-	12% (19)
Bidimensional Acculturation Scale (A)	(<i>n</i> = 133)	(<i>n</i> = 246)	(<i>n</i> = 68)	(<i>n</i> = 452)
• English	3.42 (.63)	3.78 (.25)	3.81 (.25)	3.68 (.44)
• Spanish	2.70 (.63)	2.28 (.59)	2.08 (.59)	2.37 (.64)
Bicultural Involvement Scale (A)	(<i>n</i> = 56)	(<i>n</i> = 98)	(<i>n</i> = 0)	(<i>n</i> = 154)
• Americanism	3.76 (.78)	4.05 (.57)	- (-)	3.95 (.66)
• Hispanicism	3.08 (.96)	3.04 (.87)	- (-)	3.06 (.89)
Hispanic Stress Inventory – Adolescent (A)	(<i>n</i> = 48)	(<i>n</i> = 106)	(<i>n</i> = 36)	(<i>n</i> = 190)
• Family Economic Stress	.40 (.62)	.34 (.51)	.23 (.46)	.33 (.53)
• Acculturation-Gap Stress	.63 (.76)	.43 (.54)	.38 (.66)	.47 (.63)
• Immigration-Related Stress	.31 (.70)	.07 (.18)	.15 (.43)	.14 (.43)
• Family-Immigration Stress	.19 (.48)	.09 (.31)	.00 (.00)	.10 (.34)
• Community & Gang-Related Stress	.10 (.27)	.12 (.33)	.05 (.16)	.10 (.29)

Hispanic Stress Inventory – Immigrant (A)	(<i>n</i> = 139)	(<i>n</i> = 234)	(<i>n</i> = 32)	(<i>n</i> = 416)
• Cultural/Family Conflict	.71 (.71)	.71 (.71)	.78 (.82)	.71 (.71)
Preferred language (C)				
• English	2% (3)	25% (63)	80% (65)	28% (131)
• Spanish	94% (127)	61% (152)	3% (2)	60% (285)
• Both	4% (5)	14% (35)	17% (14)	12% (54)
Gender (boys as reference group) (A)	33% (64)	34% (118)	31% (25)	33% (209)
Age (A)	14.67 (2.11)	14.62 (1.95)	14.51 (1.74)	14.60 (1.98)
Gender (women as reference group) (C)	15% (28)	17% (57)	16% (13)	17% (104)
Age (C)	41.79 (7.74)	44.34 (7.09)	41.17 (7.54)	43.09 (7.50)
Marital Status (C)				
• Single/not married	28% (55)	21% (72)	38% (31)	25% (161)
• Married	36% (70)	38% (134)	27% (22)	36% (232)
• Divorced/Separated	31% (60)	38% (132)	33% (27)	35% (227)
• Other (e.g., widowed, refused)	5% (9)	3% (12)	1% (1)	4% (26)

Note. (A): Adolescent; (C): Caregiver.

Data Screening

Descriptive Measure Data Screening

Bidimensional Acculturation Scale. The English subscale of the BAS had an initial consistency of $\alpha = .89$. Examination of the item-total correlation indicated that none of the items had near-zero correlations with other items (i.e., minimum value .44). The Cronbach's alpha could be improved with removal of items, but this step was not taken due to the adequacy of the subscale performance, the performance of each item, and efforts to use the scale in its developed form. Across the overall sample, the adolescents had an average response of 3.68 ($SD = .44$) on the English subscale, which is between the options of "Often" and "Almost Always." The average was lowest in the 1st generation immigrant adolescents (3.42, $SD = .63$), higher in 2nd generation immigrant

adolescents (3.78, $SD = .25$), and highest in 3rd generation or beyond immigrants (3.81, $SD = .25$).

The Spanish subscale had an initial consistency of $\alpha = .91$. Examination of the item-total correlation indicated that none of the items had near-zero correlations with other items (i.e., minimum value .50). The Cronbach's alpha could be improved with removal of items, but this step was not taken due to the adequacy of the subscale performance, the performance of each item, and efforts to use the scale in its developed form. Across the overall sample, the adolescents had an average response of 2.37 ($SD = .64$) on the Spanish subscale, which is between the options of "Sometimes" and "Often." The average was highest in the 1st generation immigrant adolescents (2.70, $SD = .63$), lower in 2nd generation immigrant adolescents (2.28, $SD = .59$), and lowest in 3rd generation or beyond immigrants (2.08, $SD = .59$).

Bicultural Involvement Scale. The Americanism subscale of the BIS had an initial consistency of $\alpha = .91$. Examination of the item-total correlation indicated that none of the items had near-zero correlations with other items (i.e., minimum value .29). The Cronbach's alpha could be improved with removal of items, but this step was not taken due to the adequacy of the subscale performance, the performance of each item, and efforts to use the scale in its developed form. Across the overall sample, the adolescents had an average response of 3.95 ($SD = .66$) on the Americanism subscale, on a scale from 1 ("Not at all") to 5 ("Very much"). The average was lowest in the 1st generation immigrant adolescents (3.76, $SD = .78$) and higher in 2nd generation immigrant adolescents (4.05, $SD = .57$).

The Hispanicism subscale had an initial consistency of $\alpha = .94$. Examination of the item-total correlation indicated that none of the items had near-zero correlations with other items (i.e., minimum value .39). The Cronbach's alpha could be improved with removal of items, but this step was not taken due to the adequacy of the subscale performance, the performance of each item, and efforts to use the scale in its developed form. Across the overall sample, the adolescents had an average response of 3.06 ($SD = .89$) on the Hispanicism subscale, on a scale from 1 ("Not at all") to 5 ("Very much"). The average was highest in the 1st generation immigrant adolescents (3.08, $SD = .96$) and higher in 2nd generation immigrant adolescents (3.04, $SD = .87$).

HSI-I. The family cultural stress subscale of the HSI-I had an initial consistency of $\alpha = .80$. Examination of the item-total correlation indicated that none of the items had near-zero correlations with other items (i.e., minimum value .22). The Cronbach's alpha could be improved with removal of items, but this step was not taken due to the adequacy of the subscale performance, the performance of each item, and efforts to use the scale in its developed form. The overall sample had an average score of .71 ($SD = .71$), which is between the responses "Not at all" and "A little." The average values were relatively consistent within each group (see Table 1 for details).

HSI-A. The family economic stress subscale of the HSI-A had an initial consistency of $\alpha = .80$. Examination of the item-total correlation indicated that none of the items had near-zero correlations with other items (i.e., minimum value .27). The Cronbach's alpha could be improved with removal of one item, but this step was not taken due to the adequacy of the subscale performance, the performance of each item, and efforts to use the scale in its developed form.

The culture-educational stress subscale had an initial consistency of $\alpha = .42$. Iterative efforts were made to improve performance based on item-level indicators of performance. The internal consistency remained poor after removal of two items, $\alpha = .50$, and could not be further improved. The subscale was not included in the descriptive statistics due to the poor scale performance.

The acculturation gap stress subscale had an initial consistency of $\alpha = .78$. Examination of the item-total correlation indicated that none of the items had near-zero correlations with other items (i.e., minimum value .23). The Cronbach's alpha could be improved with removal of one item, but this step was not taken due to the adequacy of the subscale performance, the performance of each item, and efforts to use the scale in its developed form.

The immigration stress subscale had an initial consistency of $\alpha = .78$. Examination of the item-total correlation indicated that none of the items had near-zero correlations with other items (i.e., minimum value .25). The Cronbach's alpha could be improved with removal of items, but this step was not taken due to the adequacy of the subscale performance, the performance of each item, and efforts to use the scale in its developed form.

The discrimination stress subscale had an initial consistency of $\alpha = .36$. Iterative efforts were made to improve performance based on item-level indicators of performance. The internal consistency remained poor after removal of two items, $\alpha = .55$, and could not be further improved. The subscale was not included in the descriptive statistics due to the poor scale performance.

The family-immigration stress subscale had an initial consistency of $\alpha = .58$. Examination of the item-total correlation indicated that one item had near-zero correlations with other items (i.e., value of $-.008$) and this item was removed (49), leading to an internal consistency of $\alpha = .61$. The Cronbach's alpha could have been improved with removal of additional items. These steps were not taken due to the adequacy of the subscale performance, the performance of each item, and efforts to use the scale in its developed form.

The community and drug-related stress subscale had an initial consistency of $\alpha = .57$. Examination of the item-total correlation indicated that one item had near-zero correlations with other items (i.e., value of $-.013$) and this item was removed (5), leading to an internal consistency of $\alpha = .65$. The Cronbach's alpha could have been improved with removal of additional items. These steps were not taken due to the adequacy of the subscale performance, the performance of each item, and efforts to use the scale in its developed form.

The family- & drug-related stress subscale had an initial consistency of $\alpha = .42$. Examination of the item-level performance suggested that the scale could not be improved through removal of items. The subscale was not included in the descriptive statistics due to the poor scale performance.

Across the HSI-A, all subscales had average values that suggested relatively low levels of endorsed stress/stressors endorsed. Specifically, all average values of the scales fell between 0 ("Not at all") and 1 ("A little") across the overall sample and within each group, or that participants were less than "a little" bothered by all stressors on average. The overall sample had Family Economic Stress average score of $.33$ ($SD = .53$),

Acculturation-Gap Stress average score of .47 ($SD = .63$), Immigration-Related Stress average score of .14 ($SD = .43$), Family-Immigration Stress average score of .10 ($SD = .34$), and Community & Gang-Related Stress average score of .10 ($SD = .29$). Details within each group are presented in Table 1.

Primary Measure Data Screening

Parent Practices Questionnaire. Exploratory factor analyses of the PPQ were conducted with 617 participants. Visual examination of the scree plot suggested the presence of one prominent factor and there appeared to be indications that three factors may be present (e.g., eigenvalues greater than 1; see Figure 3). Factor analyses were conducted with solutions for one, two, and three factors.

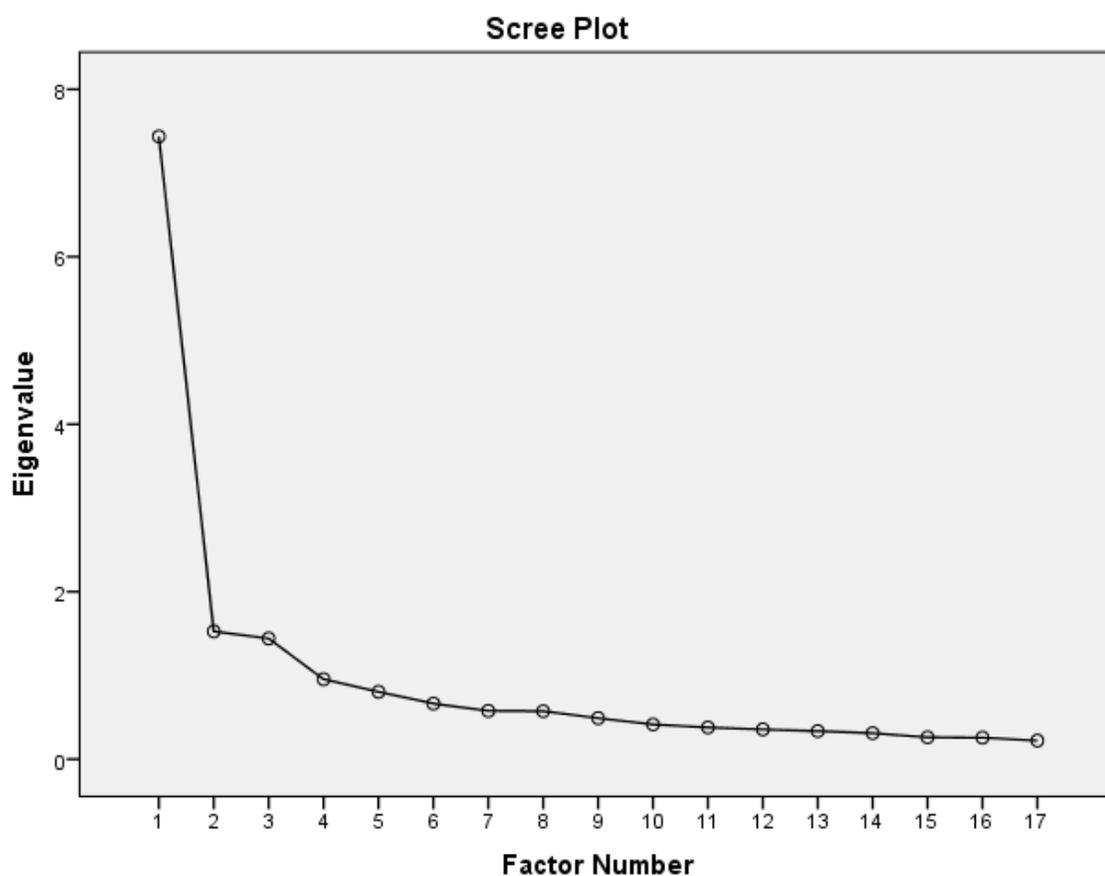


Figure 3. Scree plot for Parent Practices Questionnaire

The three-factor solution extracted 53.46% of the variance and included three factors that each had 2, 4, and 5 items with at least a “Good” loading. One item did not have at least a “Fair” loading on any factor. There were 5 of the 17 items that cross-loaded on multiple factors.

The two-factor solution extracted 46.89% of the variance and included two factors that had 5 and 6 items with at least a “Good” loading. One item did not have at least a “Fair” loading on either factor. There were 9 of the 17 items that cross-loaded on both factors.

The one-factor solution extracted 40.45% of the variance and had 14 items with at least a “Good” loading. One item did not have at least a “Fair” loading. The one-factor solution was selected due to the instance of limited items per factor within the 3-factor solution, the proportion of cross-loading items within other solutions, the magnitude of the factor loadings within the one-factor solution, and the interest in a parsimonious solution. One item was removed (11) that did not have a “Fair” loading, resulting in a solution that explained 42.05% of the variance and included items with loadings ranging from .46-.77. A composite scale was created for the PPQ with average of the 16 items that were within this analysis.

Inventory of Parent and Peer Attachment. Exploratory factor analyses of the IPPA were conducted with 595 participants. Visual examination of the scree plot suggested the presence of one prominent factor and there appeared to be indications that three factors may be present (e.g., eigenvalues greater than 1; see Figure 4). Factor analyses were conducted with solutions for one, two, and three factors.

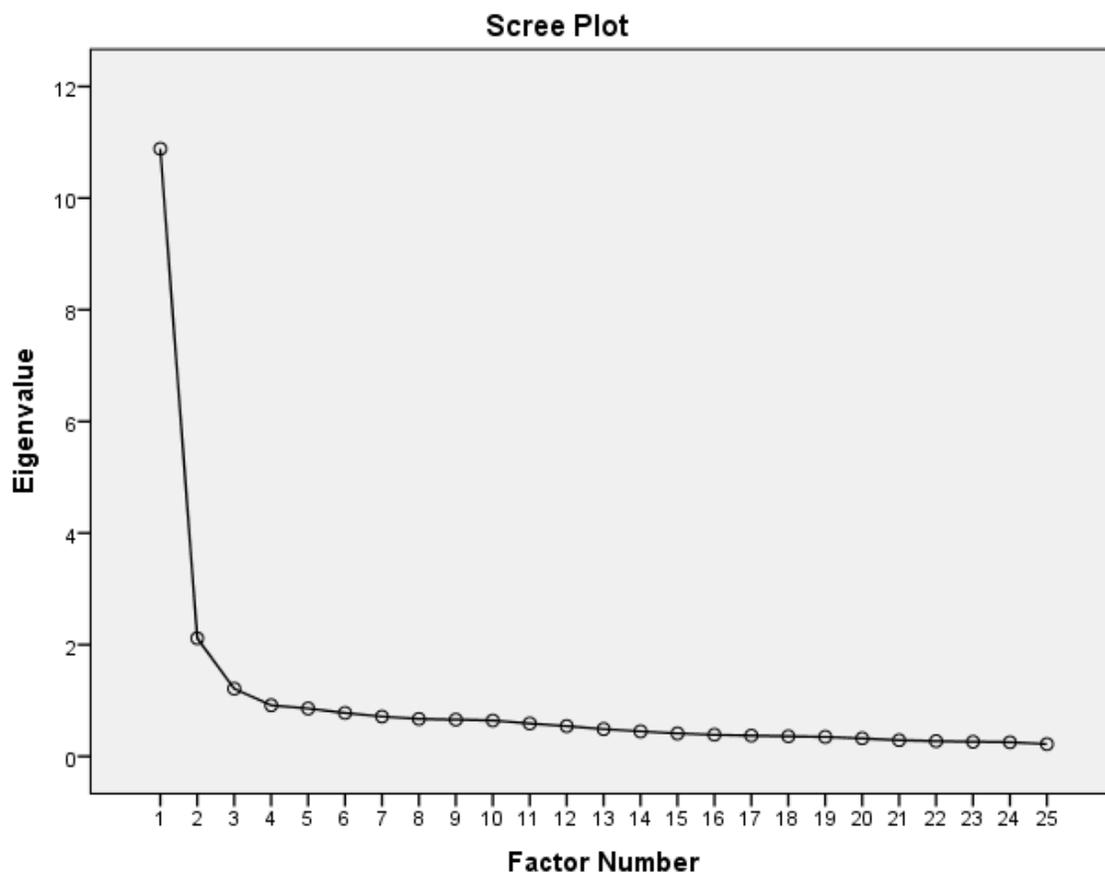


Figure 4. Scree plot for Inventory of Parent and Peer Attachment

The three-factor solution extracted 50.79% of the variance and included three factors that each had 14, 3, and 1 item(s) with at least a “Good” loading. One item did not have at least a “Fair” loading on any factor. There were 15 of the 24 items that cross-loaded on multiple factors.

The two-factor solution extracted 47.72% of the variance and included two factors that had 15 and 5 items with at least a “Good” loading. One item did not have at least a “Fair” loading on either factor. There were 6 of the 24 items that cross-loaded on both factors.

The one-factor solution extracted 41.49% of the variance and had 18 items with at least a “Good” loading. Three items did not have at least a “Fair” loading. The one-factor solution was selected due to the instances of limited items per factor within the 3-factor solution, the proportion of cross-loading items within other solutions, the magnitude of the factor loadings within the one-factor solution, and the interest in a parsimonious solution. Three items were removed (8, 9, 14) that did not have a “Fair” loading, resulting in a solution that explained 46.01% of the variance and included items with loadings that had absolute values ranging from .44-.83. A composite scale was created for the IPPA with average of the 22 items that were within this analysis and items that had negative loadings were reverse coded.

Diagnostic Interview Schedule for Children – Predictive Scales. Six separate factor analyses were conducted with the DISC. The exploratory factor analyses of the DISC ADHD items were conducted with a tetrachoric correlation matrix that was estimated based on data from 600 participants. Visual examination of the scree plot suggested the presence of one factor, as did other aspects of the factor solution (e.g., eigenvalues greater than 1; see Figure 5). A single-factor solution was the only solution that was examined.

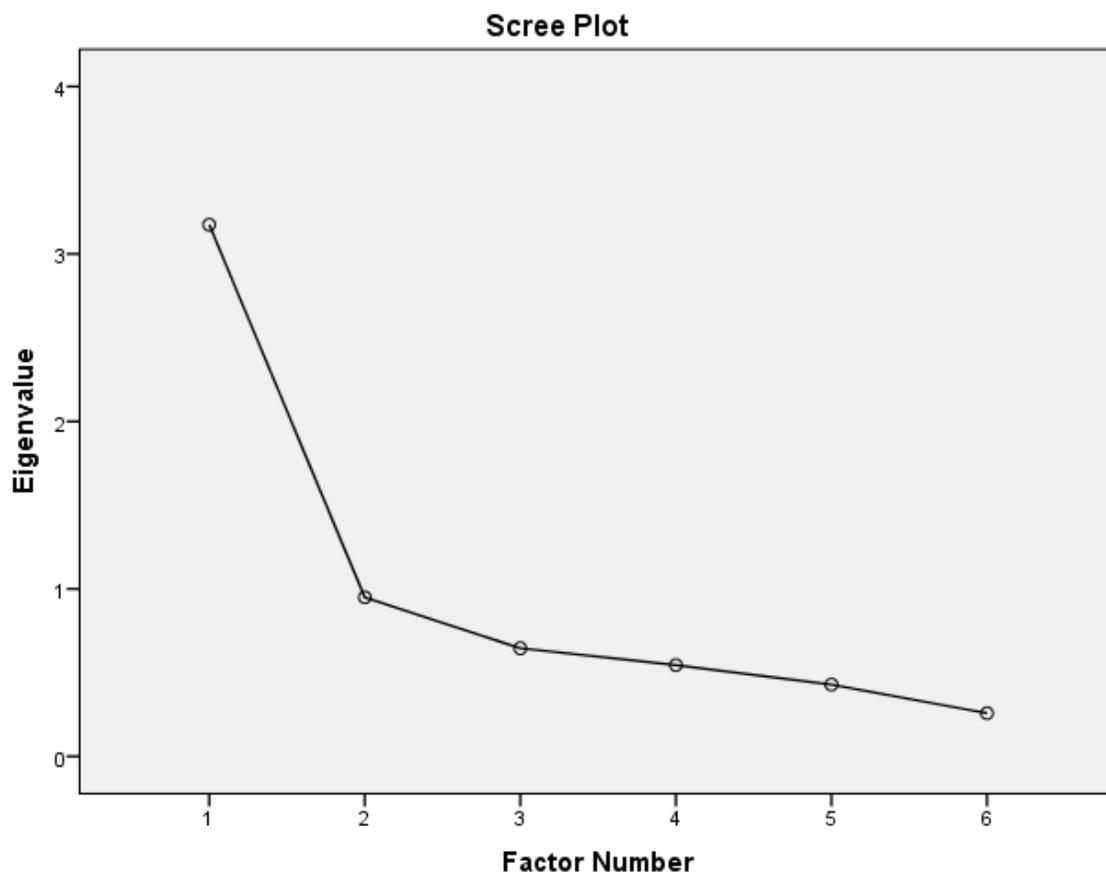


Figure 5. Scree plot for DISC ADHD

The one-factor solution extracted 45.36% of the variance and had 5 of the 6 items with at least a “Good” loading. One item did not have at least a “Fair” loading. One item was removed (66) that did not have a “Fair” loading, resulting in a solution that explained 52.93% of the variance and included items with loadings ranging from .60-85. A composite scale was created for the DISC ADHD with average of the 5 items that were within this analysis.

The exploratory factor analysis of the DISC ODD items was conducted with a tetrachoric correlation matrix that was estimated based on data from 600 participants. Visual examination of the scree plot suggested the presence of one factor, as did other

aspects of the factor solution (e.g., eigenvalues greater than 1; see Figure 6). A single-factor solution was the only solution that was examined.

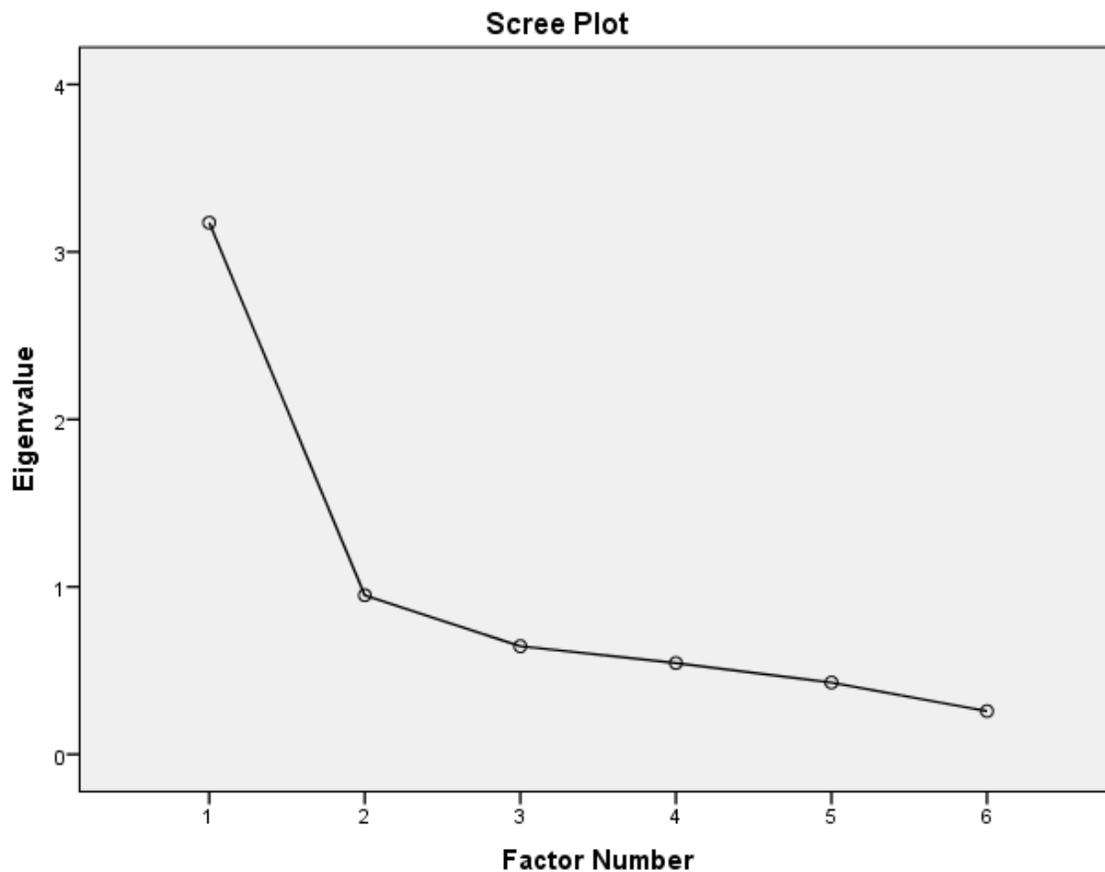


Figure 6. Scree plot for DISC ODD

The one-factor solution extracted 44.48% of the variance and all 7 items had at least a “Good” loading, with loadings ranging from .57-.75. A composite scale was created for the DISC ODD with average of the 7 items that were within this analysis.

The exploratory factor analysis of the DISC CD items was conducted with a tetrachoric correlation matrix that was estimated based on data from 600 participants. Visual examination of the scree plot suggested the presence of one factor, as did other

aspects of the factor solution (e.g., eigenvalues greater than 1; see Figure 7). A single-factor solution was the only solution that was examined.

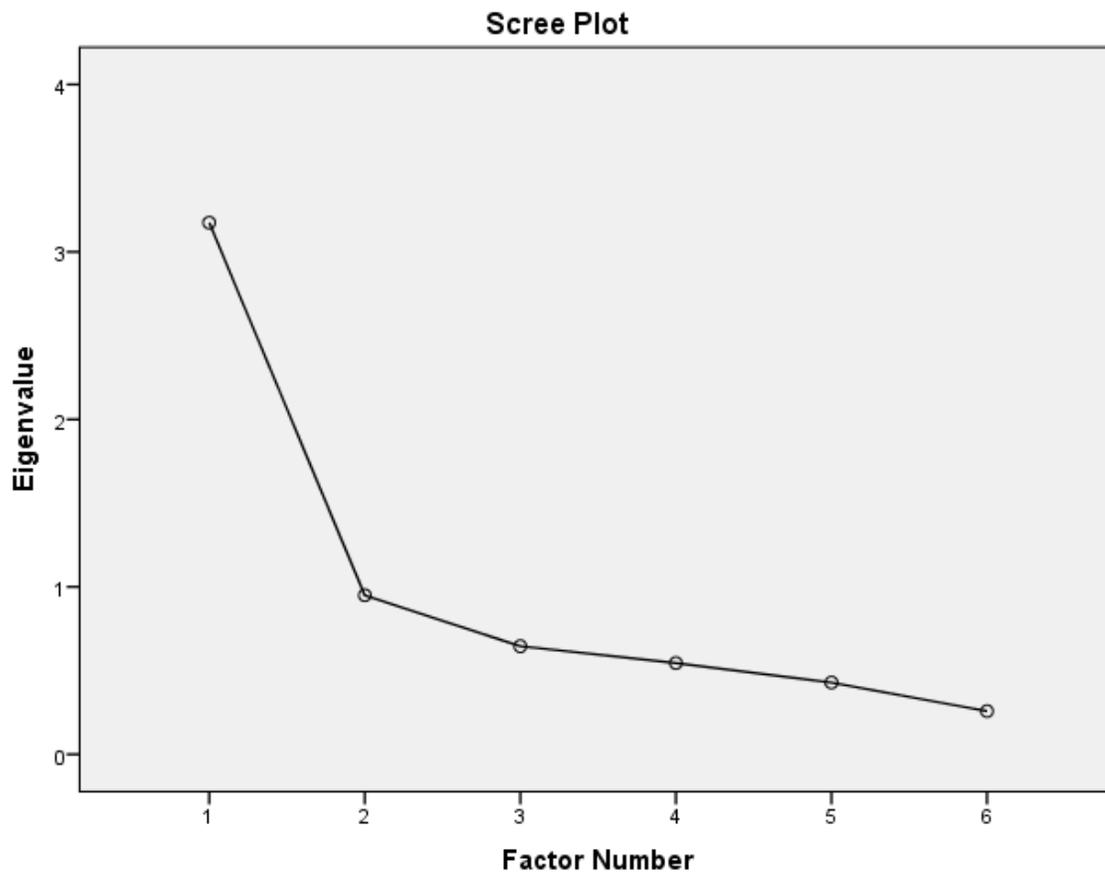


Figure 7. Scree plot for DISC CD

The one-factor solution extracted 51.65% of the variance and 7 of the 8 items had at least a “Good” loading, with loadings ranging from .51-.90. A composite scale was created for the DISC CD with average of the 8 items that were within this analysis.

The exploratory factor analyses of the DISC substance use items were conducted with a tetrachoric correlation matrix that was estimated based on data from 443 participants. The variation in study design appeared to account for a high amount of missing data (i.e., items were not administered in some of the CIFFTA studies).

Exploratory factor analyses could not be conducted because the correlation matrix was not positive definite. The decision was made to remove the DISC substance use items from the primary analyses because data were present for less than 75% of the participants (relative to other DISC composites) and due to the computational issues.

Primary Analyses

The primary analyses were conducted with data from 529 participants. The 1st-generation immigrant adolescent group included 164 participants. The 2nd-generation group included 301 participants. The 3rd-generation (and beyond) group included 64 participants.

Tests of Invariance

The initial model was specified with complete invariance; all parameters were fixed to equality across groups. The model fit was poor across all fit indices (see Table 2). Steps were taken to identify whether additional parameters could be specified to improve fit.

Table 2

Model Fit Statistics for Tests of Invariance

Invariance testing for theoretical model					
Step	χ^2 (df)	$\Delta\chi^2$	RMSEA	CFI	SRMR
Complete invariance	91.71 (44)*	-	.075*	.852	.150
Measurement invariance (<i>rejected</i>)	68.63 (26)*	23.08 (18)	.092*	.868	.105
<i>Relative to complete invariance</i>					
-CD variance 1 st gen.	85.93 (43)*	5.78 (1)*	.072*	.867	.139
-Externalizing variance 2 nd gen.	81.75 (42)*	4.17 (1)*	.070*	.876	.131
-Externalizing mean 2 nd gen.	77.85 (41)*	3.90 (1)*	.068	.885	.129
<i>Strong invariance no longer met</i>					
-CD intercept 3 rd gen.	64.79 (40)*	13.06 (1)*	.057	.923	.127
-CD variance 3 rd gen.	54.26 (39)	10.53 (1)*	.045	.953	.100
<i>Partial scalar invariance met, scalar invariance met</i>					
	-	-	-	-	-

* $p < .05$

A model was specified that freed parameters for structural components of the model (i.e., means and variances for IPPA, PPQ, and externalizing factor, covariance of IPPA and PPQ, and regression coefficients). The remaining parameters were fixed to equality across groups and included parameters involving measurement invariance (indicator intercepts, factor loadings, indicator residual variances). Comparative fit indices suggested that the model fit did not improve, demonstrated by criteria of an insignificant change in chi-square (rather than both a significant change and a change in $CFI > .01$). The measurement invariance model was rejected and steps were taken to improve model fit of the complete invariance model. Parameters for structural invariance were considered a priority in examining which parameters could be freed to improve model fit.

Modification indices were examined to determine if model fit could be improved while retaining strong measurement invariance. That is, parameters were considered for model improvement to allow measurement error in addition to the previously considered parameters (i.e., freeing parameters of residual variances for latent variable indicators). Model fit was improved by freeing one parameter for residual variance of the latent variable indicator (CD in 1st generation adolescents). Parameters of structural invariance also freed, including the variance of externalizing in 2nd generation adolescents, then the mean of externalizing in the same group. The model fit remained inadequate and no additional parameters could be freed to significantly improve model fit while maintaining strong measurement invariance.

Modification indices were examined to determine if model fit could be improved while retaining scalar measurement invariance. That is, parameters were considered for

model improvement to allow for the meaning in the level of each indicator variable in addition to the previously considered parameters (i.e., freeing parameters of indicator intercepts). Model fit was improved by freeing one parameter for the intercept (CD in 3rd generation). The residual variance of the same variable within the same group was also freed to improve the model. The model demonstrated adequate fit after this change (see Table 2) and no additional efforts were made to improve model fit.

Examination of the modification indices suggested that there were no additional parameters that would lead to significant improvement in the model. Thus, exploratory hypotheses of further differences across immigration-based groups did not appear to warrant investigation. There was one parameter of interest that was freed in the process of improving model fit, the externalizing problems mean for 2nd-generation adolescents, and there did not appear to be any additional differences across the groups in parameters of interest (i.e., means of PPQ, IPPA, or externalizing, or regression coefficients).

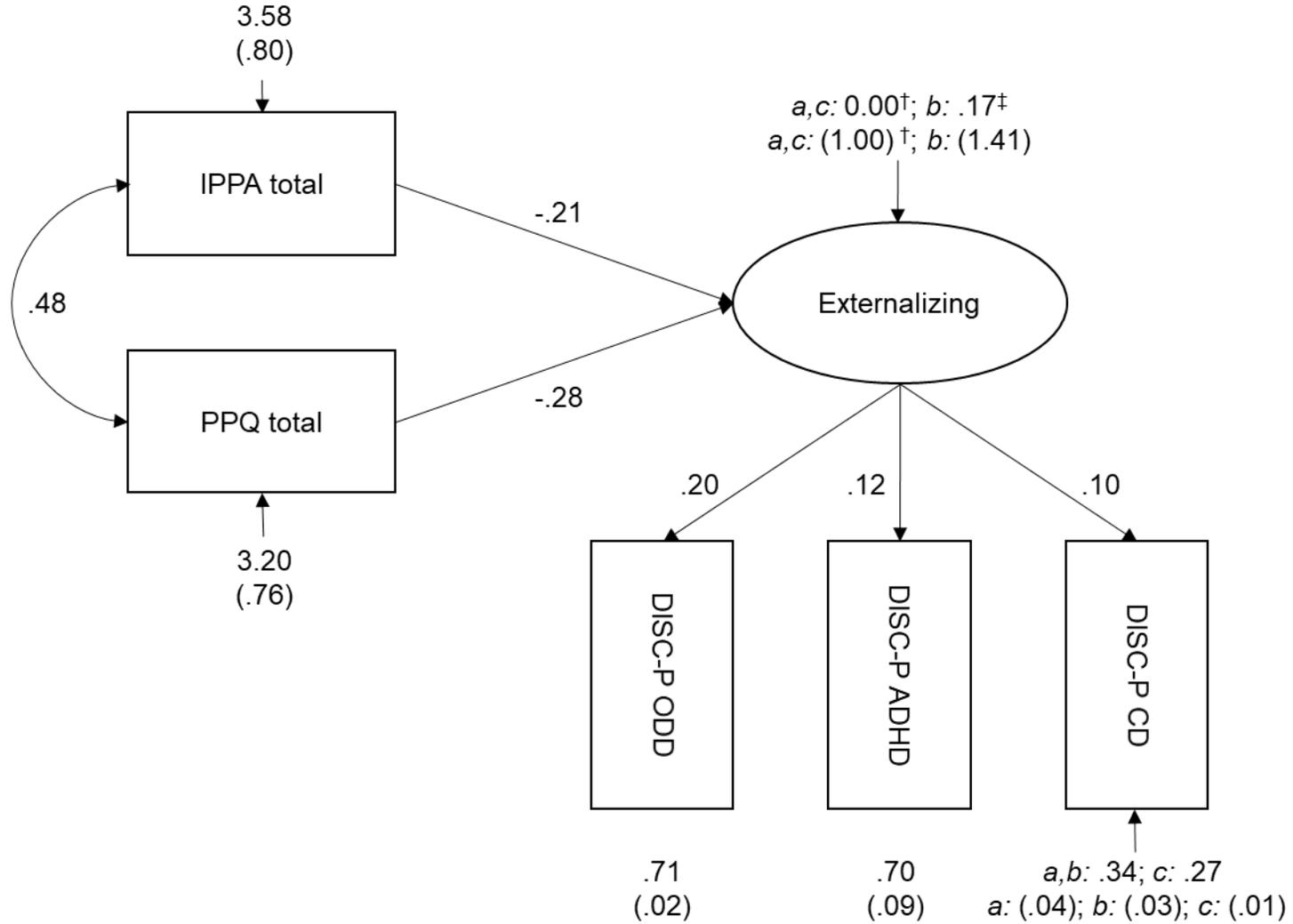


Figure 8. Unstandardized parameter estimates of final model

Note. a: 1st-generation immigrant adolescent, b: 2nd-generation, c: 3rd-generation; parameters include covariance, regression coefficients/factor loadings, means/intercepts (variances); all parameters significant at $p < .01$ except where indicated (†: parameter fixed and standard errors not estimated [significance testing not conducted]; ‡: $p = .10$)

Summary

The results of the structural equation modeling showed support for the hypotheses. Specifically, the structural equation model demonstrated that a spectrum-based measurement model could represent externalizing problems with indicators consisting of variables defined by the average symptoms within externalizing disorders (i.e., oppositional defiant disorder, attention-deficit/hyperactivity disorder, conduct disorder). Furthermore, the results suggested that the meaning of the latent externalizing variable was relatively consistent across groups. That is, most of the parameters that varied across groups were the residual variances. This means that there were differing degrees of measurement error across the groups. The factor loadings were fixed across groups, suggesting that the changes in the symptoms of each externalizing disorder variable corresponded to the same degree of change in the latent externalizing variable. Only one group had an indicator intercept that differed, suggesting that the scale of conduct disorder differed within the 3rd generation group relative to the other groups. In other words, there was a difference in what level of conduct disorder symptoms was considered average in relation to latent externalizing problems. The minor degree of invariance suggests that the latent externalizing problem variable can be interpreted similarly across groups and the model fit indices suggest the solution can adequately capture the shared variance in observed variables with the latent variable.

The regression coefficients within the structural equation model also show support for the hypothesis that the adolescent-caregiver dynamic has a negative association with externalizing problems. Specifically, the externalizing variable had a significant negative relationship between both the IPPA and PPQ variables. That is, an

increase in the quality of attachment was associated with a decrease in externalizing problems. Likewise, an increase in the parenting practices that were implemented was associated with a decrease in externalizing problems. These results supported the broad hypothesis that a healthier quality of relationships would be associated with lower levels of externalizing problems.

The exploratory hypotheses revealed one minor difference across groups (see Figure 8 or Table 3). There appeared to be significantly different means across groups for the latent externalizing variable, whereas the other parameters of interest seemed to be consistent across groups. The parameters suggested a tendency for the 2nd-generation immigrant adolescents to have higher levels of externalizing problems. Significance testing of the parameter within the model suggest that this was a marginal difference (i.e., $p = .10$, relative to 0.00 [the same value at which the parameter was fixed for the other groups]). The value of 0.17 for 2nd-generation adolescents was higher than the value of 0.00 that was specified for the other groups. There did not appear to be significant differences in the quality of adolescent-caregiver dynamics across groups (i.e., means of IPPA and PPQ did not differ). Likewise, each group showed consistencies in the associations that externalizing problems had with both the IPPA and PPQ. This suggests that the relationship between adolescent-caregiver dynamics and externalizing problems is relatively consistent across generation of immigration. Although the variance of variables was not a focus of the hypotheses, the 2nd-generation immigrant group had a latent externalizing variance that differed from the other groups. This suggests that there may be a greater degree of variability in the degree of externalizing problems within 2nd-generation immigrant adolescents.

Table 3

Focal Parameters of Structural Equation Model

Focal parameters	<u>Immigration-based groups</u> (Constrained when one value is presented)		
	1 st -gen.	2 nd -gen.	3 rd -gen. (& beyond)
Externalizing			
• Externalizing mean	0.00 ^a	0.17	0.00 ^a
• Externalizing variance	1.00 ^a	1.41	1.00 ^a
IPPA			
• IPPA mean		3.58	
• IPPA variance		.80	
PPQ			
• PPQ mean		3.20	
• PPQ variance		.76	
Path coefficients			
IPPA → Externalizing		-21	
PPQ → Externalizing		-28	

Note. Parameters labeled “a” are constrained to equality between groups.

CHAPTER FIVE: DISCUSSION

This dissertation has enhanced the field's understanding of externalizing problems within Hispanic/Latinx adolescents by utilizing a spectrum-based approach to psychopathology and by conceptualizing variables based on constructs of Bronfenbrenner's bioecological theory (Bronfenbrenner, 2005). Externalizing problems were measured as a latent variable that captured symptoms of various externalizing disorders (ADHD, ODD, and CD). The adolescent-caregiver relationship dynamics were viewed as proximal processes involved with the development of externalizing problems and results supported hypotheses that the quality of dynamics would be negatively associated with externalizing problems. The adolescent's generation of immigration was conceptualized as a contextual variable and strategies were used to examine adolescent-caregiver dynamics and externalizing problems across groups defined by immigration history. Findings show commonalities in the characteristics and importance of the adolescent-caregiver relationship across adolescents with varying immigration histories and the research provides direction in utilizing the last iteration of Bronfenbrenner's bioecological theory.

Interpretation of Primary Analyses

The primary analyses showed support for the hypotheses and provided information of value in understanding the intersection of externalizing problems, adolescent-caregiver dynamics, and immigration history of Hispanic/Latinx adolescents. A broad dimension of externalizing problems was supported (Caspi et al., 2014; Donovan & Jessor, 1985; Krueger et al., 2005; McGee & Newcomb, 1992). Additionally, the results fit with theoretical efforts aimed at applying ecological theory in understanding

externalizing problems within Hispanic/Latinx adolescents (Cox et al., 2011; Pantin et al., 2004; Prado et al., 2008). Specifically, the findings supported the need to consider influences of social systems in which the adolescent is directly within (i.e., adolescent-caregiver dynamics) and that there is utility in examining potential interactions of contextual variables (i.e., immigration history). There was support found with the hypothesis of a negative association between adolescent-caregiver dynamics and externalizing problems as well as with the evidence of a higher level of externalizing problems in 2nd-generation immigrant adolescents. Externalizing problems can be represented as a spectrum by measuring symptoms of specific externalizing disorders, this spectrum is associated with adolescent-caregiver dynamics, and it is shaped by the context of immigration.

The externalizing spectrum. The results of structural equation modeling supported the hypothesis that a spectrum-based measurement model can represent externalizing problems with indicators consisting of variables totaling the symptoms for specific externalizing disorders. Three of the four variables that represented externalizing disorders were included in the model, with ODD, CD, and ADHD included in the model. An indicator to represent substance use disorders was not included in the model due to limitations in the study. An externalizing spectrum based on the disorders present within the results entirely with prior research (Kotov et al., 2017; Witkiewitz et al., 2013). The results were also generally consistent with studies that only include some disorders that were examined in the present study (Caspi et al., 2014; Feaster et al., 2010; Krueger et al., 2005). That is, these studies did not include all of the constructs within the present study (e.g., did not include variable for ADHD) or included variable(s) to capture

substance use, and the results of these studies also identified a latent externalizing factor. A structural equation model that specified a latent variable that captured ADHD, ODD, and CD demonstrated model fit within the results and supported the existence of a spectrum of externalizing problems.

The findings also supported the use of a psychopathology-based conceptualization to explain externalizing problems. Kotov and colleagues (2017) proposed a hierarchical structure in which there are spectra present, ranging from a broad psychopathology dimension, broad higher order factors, categories of specific disorders, and symptoms of these disorders. There were efforts to follow direction of these researchers by capturing multiple levels of the hierarchy within a study. Specifically, a higher order externalizing spectrum was specified in the structural equation model, specific disorders were captured as the variables in the model, and symptoms were also captured as the proportion of symptoms within each composite variable in the model. This externalizing spectrum of psychopathology is theorized to be influenced by processes of nature and nurture, ranging from genetics to the capacities of the brain and the social environments that shape development (Caspi et al., 2014; Kotov et al., 2017; Sanislow et al., 2010). These theoretical processes of the externalizing spectrum of psychopathology fit with the hypothesized role of biological and social processes in Bronfenbrenner's bioecological theory (Bronfenbrenner & Ceci, 1994). The results demonstrated that a hierarchical structure of psychopathology could capture externalizing problems within Hispanic/Latinx adolescents and the theory that underlies this model of psychopathology complements the approach of examining bioecological influences.

Application of theoretical constructs. The results of the dissertation demonstrated techniques and strategies in applying Bronfenbrenner's bioecological theory (Bronfenbrenner, 2005). The use of structural equation modeling allowed for a flexible approach in model specification in which variables could be examined and hypothesis testing could take place. Core features of applying bioecological theory could be implemented, such as examining social processes that have a direct influence on the development of an outcome and the possibility of differential influences across contexts (Bronfenbrenner & Evans, 2000). The strategies taken in the present study offers a unique application of theory, relative to analyses and models that have taken trickle-down approaches to examining social context (e.g., Bacio et al., 2015; Prado et al., 2010). The approach taken in the present study heightens the level of detail in understanding the variables and relationships that have been examined through broader and comprehensive strategies. That is, the analyses allowed for a focused examination in the relations between adolescent-caregiver dynamics and externalizing problems across adolescents with varying immigration histories.

Adolescent-caregiver proximal processes. The broad hypothesis that the adolescent-caregiver dynamic will be negatively associated with externalizing problems was supported. Significant negative relationships were found between externalizing problems and both parenting practices and parental attachment. These results are consistent with the broad idea that the family is a central influence for development (Bronfenbrenner, 2005) and that family influences are important for understanding externalizing problems within Hispanic/Latinx adolescents (Cox et al., 2011; Pantin et al., 2004; Prado et al., 2008; Szapocznik et al., 2007). Results supported the broad

hypothesis that healthier patterns in the adolescent-caregiver relationship would be associated with lower levels of externalizing problems.

Proximal processes are the bidirectional interactions between the individual and the environment and the interactions become increasingly complex as development occurs (Bronfenbrenner, 2005). A unidirectional association was specified and supported between variables for adolescent-caregiver dynamics and externalizing problems. Although longitudinal research would be needed to demonstrate interactions across time, the findings of the present study would be expected with the existence of bidirectional influences between the adolescent and caregiver in the development of externalizing problems. The direct influence of parenting practices supports previous research that highlights the role of parental involvement and aspects of the disciplinary style (Cox et al., 2011; Dodge et al., 2008; Van Ryzin et al., 2012). Similarly, the direct influence of attachment supports previous research that has identified the quality of the bond, warmth, or connectedness as an influential aspect of the relationship (Pantin et al., 2004; Prado et al., 2008; Van Ryzin et al., 2012). The consistent effects that suggested adolescent-caregiver relations have a role in protecting against externalizing problems and show support for intervention efforts with Hispanic/Latinx adolescents that target the family unit and processes involved with the adolescent-caregiver dynamics (Santisteban & Mena, 2009).

The results also provide direction for further investigation into the proximal processes of Hispanic/Latinx adolescent externalizing problems. For example, there have been relatively consistent effects involving the role of peers in the development of externalizing problems (e.g., Bacio et al., 2015; Dishion et al., 1999, 2012; Prado et al.,

2010). A focus may be taken to evaluate whether the peer-based influences make additional influences to externalizing problems or in considering factors that interact with the peer-based influences. Similarly, the adolescent-caregiver dynamics have been found to have progressively complex influences, particularly through the changes in which variables influence externalizing problems throughout development (e.g., monitoring earlier and warmth/attachment later; Dodge et al., 2008; Van Ryzin et al., 2012). The strategies taken in the present study could be expanded upon to test these processes, such as incorporating the effects of age into the model and testing interaction terms between age and adolescent-caregiver dynamics. The present study offers findings and strategies that could be expanded upon to provide further clarity in understanding proximal processes of externalizing problems within Hispanic/Latinx adolescents.

Immigration history context. The results tended to show consistencies rather than differences when considering the exploratory hypotheses that the immigration-based groups differed in the quality of adolescent-caregiver dynamics, levels of externalizing problems, or associations between these variables. Results suggested a marginal difference across groups, with a higher degree of externalizing problems in 2nd-generation adolescents relative to the other groups. Prior research has found that 1st-generation immigrant adolescents have lower levels of externalizing problems than 2nd- or 3rd-generation immigrant adolescents (Cervantes et al., 2013), and the results of the present study demonstrated slightly different findings. The results of the present study and possibly the prior research may demonstrate the immigration paradox (Szapocznik et al., 2007). Specifically, the generation of immigration may influence externalizing problems by being uniquely associated with opportunities for cohesion and bonds from shared

immigration experiences or unique stressors associated with immigration, such as gaps in acculturation between the adolescent and caregiver. However, the results of the present study did not identify differences in the quality of adolescent-caregiver dynamics across generation of immigration, suggesting that the quality of bonds is relatively consistent across adolescent-caregiver dyads across immigration history. That is, the differences in family-level stressors across immigration-based groups (Cervantes et al., 2013) may not affect externalizing problems by disrupting the quality of the adolescent-caregiver relationship. The slight elevations in 2nd-generation adolescent externalizing problems appears to show some consistency with prior research and future research may provide additional clarity in understanding differences based on the context of immigration history.

The results support that there are many consistencies across the immigration-based groups. There appeared to be similar quality of adolescent-caregiver relationships across groups and there were consistent effects in terms of the associations between adolescent-caregiver dynamics and externalizing problems. Research suggests that parents hold beliefs that acculturation contributes to detriments in the adolescent-caregiver relationship or that adolescents have less respect or responsiveness to caregivers when they become acculturated (Schwartz et al., 2010; Wagner et al., 2008). These processes were not supported in the present study, in that differences were not found that involved differences in the mean values of adolescent-caregiver relations (or less robust associations in groups to indicate less influence from caregivers). The consistencies across groups further emphasize the importance of the family unit in reducing externalizing problems within Hispanic/Latinx adolescents (Cox et al., 2011;

Pantin et al., 2004; Prado et al., 2008; Szapocznik et al., 2007). The results further support that adolescent-caregiver dynamics are an important target for interventions (Santisteban & Mena, 2009) because of the evidence that they are consistently associated with fewer externalizing problems, regardless of the generation of immigration.

Interpretation of Descriptive Statistics

The descriptive statistics appeared to show consistencies with expected patterns of across immigration-based groups. Although hypothesis testing was not conducted to examine the discrepancies across the groups, the results fit with the notion that a number of variables that are shaped by the intersection of family and culture (Schwartz et al., 2010; Szapocznik et al., 2007). These differences offer direction for identifying variables to account for processes involved with the development of externalizing problems.

Specifically, adolescent-level results suggest increases in preferences for English as history of immigration becomes more distant, as well as decreases in preferences for use of Spanish and use of both languages. The results seemed consistent with notions that language fluency has importance as a dimension of acculturation (Schwartz et al., 2010). Cultural orientation appeared to show similar patterns with increases in preferences for American/English language/practices and decreases in preferences for Hispanic/Spanish language/practices.

The use of adolescent-specific measures of culture-related stressors (Cervantes et al., 2012) appears to be justified based on the descriptive statistics. Specifically, the results appeared to be consistent with prior research (Cervantes et al., 2013) in an apparent decreasing level of immigration-related stress that the adolescent experiences and in adolescents' stress related to immigration of family members. There also appeared

to be other variables that appeared to show decreases with more distant immigration history (e.g., acculturation-gap, economic stress) and there may be a need for research that replicates immigration-based differences (Cervantes et al., 2013) or considers other factors that may influence results (e.g., sample characteristics). The results of the culture-related stressors also appeared to be consistent with the values found in prior research (Cervantes et al., 2012;2013), with mean values tending to be between “not at all worried/tense” and “a little worried/tense.” Adolescent-specific measures of culture-related stress (Cervantes et al., 2012) appeared to provide a nuanced picture of experiences, relative to the measure that was developed for use with adults (Cervantes et al., 1991).

In summary, the descriptive statistics appeared to capture differences across immigration-based groups. Prior research has connected culture-related variables to discrepancies in externalizing problems, such as findings that suggest relations with culture-related stressors (Cervantes et al., 2013) and acculturation (Unger, Schwartz, Huh, Soto, & Baezconde-Garbanati, 2014; Wagner et al., 2008). Future research into externalizing problems within Hispanic/Latinx adolescents would likely benefit from consideration to the multidimensional factors of acculturation (Schwartz et al., 2010), including variables that were described in the present study.

Limitations

The present study included limitations that are important to recognize and consider in the interpretation of the findings. These limitations include aspects of the analyses and results, properties of the study design, and application of the theory. The

limitations of the present study are also reasons that support a need for continued research and investigation.

A number of variables that were involved with the primary analyses had issues involving measurement or error. For example, the efforts to include an indicator for substance use behaviors were unsuccessful, whereas a composite variable has been included in prior analyses (Feaster et al., 2010). The study design in the present research likely contributed to the exclusion of the measure but the criteria for evaluating the structure of the scale in the present study also differed from previous research. The factor structure and characteristics of variables that are included in analyses should be examined with set criteria (e.g., Costello & Osborne, 2005), and the measurement issues that were found in the present study highlight the need for quality indicators of substance use behaviors within Hispanic/Latinx adolescents. Additionally, the descriptive statistics demonstrated various subscales that did not perform as previously demonstrated (Cervantes et al., 2012). Likewise, the structural equation model incorporated a variety of parameters involving measurement error across immigration-based groups. There may be unspecified measurement error that accounts for these discrepancies (Rigdon, 1994) and this error may exist within the item-level data that was used to create the composite variables. Taken together, there may be a need to conduct analyses that replicate prior findings in the structure of measures (e.g., Cervantes et al., 2012) as well as studies to analyze the possibility of item-level measurement invariance (e.g., Thompson & Green, 2013) across specific immigration-based groups. That is, the limitations suggest that further investigation may be necessary to better understand the measurement properties

of commonly used instruments and the capacity to use these measures across various segments of the Hispanic/Latinx population.

The present study had limitations that were present as a result of the design of the study. This study was a secondary analysis of data from several studies focused on developing and testing a family-based intervention. The participants demonstrated either signs of problem behaviors or with clear evidence of problems, whereas other investigations of Hispanic/Latinx adolescents have examined samples more representative of the entire population (e.g., Cervantes et al., 2013, 2014). Thus, the results of the present study may not be generalizable to Hispanic/Latinx adolescents who do not demonstrate signs or impairment with externalizing problems and there may be a limited degree of variability in the data for the present study due to the participants who were included in the present study. Additionally, aspects of the study design led to limitations with measure selection, such as the limited number of participants who completed measures related to substance use behaviors and differences in measure selection relative to past research (e.g., Feaster et al., 2010). Examining externalizing problems in a way that is consistent with prior research may be ideal to ensure that latent constructs have the same meaning across studies and efforts should be made to maintain consistency with prior research. Despite the presence of some limitations in relation to aspects of the study design, the secondary analysis of data was beneficial in that it allowed for a relatively large sample to be examined with commonly used measures that capture a variety of domains of functioning.

An additional limitation is that the present study did not fully apply Bronfenbrenner's bioecological theory (2005). The inability to apply the last iteration of

Bronfenbrenner's theory is a valid critique and it is suggested to be rare for studies to effectively implement the theory in its entirety (Tudge et al., 2009, 2016). A true application of the theory would incorporate each component of the PPCT model into the research to understand a developmental outcome, rather than selecting a few constructs as was done in the present study. That is, the proximal processes would be represented as complex reciprocal interactions between the developing person and the environment, influences would be examined that include the attributes of the developing person as well as the context in which the person exists, and development would be understood through analyses that captured growth and change across time. The present study used the theoretical lens by identifying variables that align with specific components of the model, rather than demonstrating effects in ways that are consistent with the theory. Further research may expand upon the findings of this research by examining bidirectional relationships and processes between adolescents and caregivers, rather than examining this as a univariate association that only captures the adolescent's perspective of functioning. Further steps may also consider various aspects of time, such as the ongoing interactions between adolescents and caregivers or the changes across time and changes in response to interventions. Although the present study was not adhering to Bronfenbrenner's PPCT model, it is hoped that the lenses and strategies used provide direction for future researchers who seek to apply the PPCT model.

Future Directions in Research

Continued research on externalizing problems within Hispanic/Latinx adolescents will allow for tools to be enhanced in providing culturally informed interventions that are tailored to the adolescent and social system in which they exist (e.g., Santisteban et al.,

2013). There are specific processes that contribute to the development of a spectrum of externalizing problems, with some processes that are unique to Hispanic/Latinx individuals, some that vary within this population, and other influences that are shared across other ethnic groups. Recognition of these processes through continued research may offer supports in the development of Hispanic/Latinx individuals, combating issues that may result from externalizing problems in this population such as a weakened family unit (Wakefield & Wildeman, 2011), community-wide disruptions (Singer, 2000), disparities or disengagement from treatment (Alegría et al., 2011, Mulatu et al., 2009), or additional mental health problems (Chisolm et al., 2009). Further understanding the development and maintenance of externalizing problems within Hispanic/Latinx adolescents will enhance the ability to provide treatments and preventative interventions to enhance the well-being of these individuals.

Research that applies Bronfenbrenner's bioecological theory (2005) and constructs of Bronfenbrenner's theory would be a valuable in continuing to examine the interplay between the adolescent, social processes, and their social context. This research would be accomplished by examining variables that capture domains of the PPCT model. For example, future research may take a specific focus on peer-related processes (Dishion et al., 1999; 2012) and considering how the bidirectional interactions between adolescents and their peers relate to externalizing problems. Consideration may also be given to person-level variables, such as conducting research that uses a bioecological lens to demonstrate how a person-level variable of gender influences the parenting behaviors that are implemented (Wagner et al., 2008). I agree with scholars who have previously described limitations in the clarity of the construct of context (Rosa & Tudge, 2013) and

strategies of outlining what the blueprint of each context is may prove useful in future research. Strategies were taken in this study to describe how the adolescent's family immigration history was a construct that was defined by characteristics the adolescent, parent, and how each relate to their countries of origin. Future research may take similar strategies to examine group-based variables to define context, such as specifying properties of families (e.g., comparing a single-parent family, a family with married parents, and a family with divorced parents). Further, analyses would also benefit from incorporating developmental processes across time. Clinical intervention research that examines mechanisms of change between the baseline assessment and post-intervention (e.g., Black & Chung, 2014) accomplishes this task, and these strategies would be essential in demonstrating the value of interventions that use tailored processes based on the context and clinical presentation of adolescents (i.e., Santisteban et al., 2013). In addition to monitoring the development of specific changes across time through mediating processes, there is also value in examining other aspects of time, such as development across early adolescence through adulthood (Van Ryzin et al., 2012) or examining trends by annually examining population-level behaviors (Johnson et al., 2017; Kann et al., 2018). It is recognized that the individual is nested within an extensively complex sets of social structures (Bronfenbrenner, 1979) and there is a high potential to gain from applying current theoretical perspectives (Bronfenbrenner, 2005) to capture how these complex influences contribute to the development of externalizing problems.

The results and limitations of the study also provide direction for areas in further research. A latent variable model of externalizing problems was supported in the present

study, which is consistent with dimensional approaches to psychopathology (Caspi et al., 2014; Kotov et al., 2017; Witkiewitz et al., 2013). Approaches that recognize a broad pattern of externalizing problems that is based on symptoms and diagnoses may complement use of theories that consider the biological, behavioral, social, and contextual phenomena involved with development (e.g., Bronfenbrenner, 2005). The latent variable models for externalizing problems have been used in prior research of Hispanic/Latinx adolescents (Coatsworth et al., 2000). These efforts may be continued by researchers who have emphasized theories rooted in ecological processes to explain externalizing problems in general (Coatsworth, Pantin, & Szapocznik, 2002), as well as specific forms of behavior such as substance use (Cox et al., 2011; Prado et al., 2008; Szapocznik & Coatsworth, 1999) or risky sexual behavior (Pantin et al., 2004). Continuing to conceptualize externalizing problems as a broad pattern may be particularly valuable, especially when intervention strategies target or affect a number of these areas.

The examination of context in the present study and the findings in this area also provide some direction for further research. There were few differences found across groups, with signs that 2nd generation adolescents may have higher levels of externalizing problems than the remaining adolescents. Further research may help determine if these findings were spurious or if the groups account for differences in externalizing problems based on immigration history, such as in findings of prior research (e.g., Cervantes et al., 2013). The lack of differences across groups may be suggestive that the adolescent-caregiver relationship is consistently influential across groups. Alternatively, the limited differences in the groups may be an indication of limitations in classifying individuals

into groups based on these criteria. The various dimensions of acculturation (Schwartz et al., 2010) may not be adequately represented by the classification used in this study. In other words, the “blueprints” that were used to specify context may benefit from reexamination. Further research may make efforts to use variables that represent the dimensions of acculturation and enculturation (Schwartz et al., 2010) within both adolescents and caregivers to examine whether alternate classifications provide more meaningful contextual blueprints. For example, latent class analyses may be used with groups that are identified that capture gaps in acculturation between the adolescent and caregiver (e.g., Santisteban et al., 2013; Szapocznik et al., 2007) or that capture groups strongly identified with American culture, their culture of origin, both cultures, or neither culture (Berry, 1980; Schwartz et al., 2010; Szapocznik et al., 1980). There is an infinitely complex series of interactions that occur to shape the contexts and social structures in which Hispanic/Latinx adolescents exist and further research may be aimed at understanding efforts to classify or capture these contexts and their influences.

Applications to Practice

Findings of the present study show consistencies with efforts that are made in reducing externalizing problems within Hispanic/Latinx adolescents and the results provide directions for these efforts. The findings that support a broad pattern of externalizing problems have implications for evaluation and treatment. The conceptualizations of bioecological theory (Bronfenbrenner, 2005) may also have utility in treatment settings, as may findings that further demonstrate the importance of the adolescent-caregiver relationship. The present study aimed to enhance knowledge of externalizing problems within Hispanic/Latinx adolescents, bioecological influences that

relate to these problems, and this knowledge is expected to have value in responding to these issues to enhance the well-being of Hispanic/Latinx adolescents.

The findings of the present study supported the presence of a spectrum of externalizing problems and this has applications in the assessment and treatment efforts. A dimensional approach to psychopathology has been argued to reduce problems involved with classifying diagnoses as discrete categories (Caspi et al., 2014; Kotov et al., 2017) and the results of the study support strategies of assessing externalizing problems as a spectrum. That is, the presence or absence of a diagnosis based on standard diagnostic criteria (American Psychiatric Association, 2013) may not have as much meaning as examination of specific symptoms of disorders. Assessment tools may be used that correspond to dimensional models of psychopathology (e.g., Achenbach & Ruffle, 2000), and these may be effective in evaluating symptoms prior to treatment and in evaluating change (Kotov et al., 2017). Similarly, clinicians may be required to respond to a variety of behaviors during the course of treatment, such as oppositional and defiant behaviors with adolescents meeting criteria for a substance use disorder. Additionally, it may be beneficial to carefully assess a range of externalizing behaviors and patterns after any externalizing problems are identified (e.g., adolescents who have been arrested or who have disciplinary problems in school). Recognizing psychopathology as spectra helps account for the broad impacts of treatment (Kotov et al., 2017) and fit with treatments that target broad patterns of delinquency and related externalizing problems (Chamberlain, Leve, & DeGarmo, 2007; Henggeler & Sheidow, 2012; Schaeffer & Borduin, 2005). Strategies that recognize and target the broad patterns of externalizing behavior fits with the presence of a dimensional structure of

psychopathology and these strategies have value for treatment and assessment efforts with Hispanic/Latinx adolescents.

Support was found in the importance of the adolescent-caregiver relationship and its relation to externalizing problems within Hispanic/Latinx adolescents. More broadly, the family unit is central to the well-being of Hispanic/Latinx adolescents (Cox et al., 2011; Pantin et al., 2004; Prado et al., 2008; Szapocznik et al., 2007). The adolescent-caregiver relationship has been found to be influential in relation to externalizing problems throughout childhood and adolescence (Dodge et al., 2008; Van Ryzin et al., 2012). The present study demonstrated that externalizing problems were negatively associated with the parenting strategies used and the quality of the attachment between the adolescent and their caregiver. In terms of the strategies used in parenting, prior research has shown that strategies that included supervision and setting rules are effective in reducing problematic behaviors during early adolescents (Van Ryzin et al., 2012). The measure in the present study included strategies that involved strategies of positive reinforcement and to be involved with the adolescent's daily life. Intervention efforts that support parents in maintaining these efforts are likely to be worthy targets for intervention, particularly when considering discord or strain that could result from disciplining a temperamental adolescent (Szapocznik & Coatsworth, 1999) and differences in parents' responses based on the forms of behavior problems exhibited by adolescents (Gorman-Smith et al., 1996). Similarly, efforts may be valuable in ensuring that the adolescent feels attached to their caregiver by minimizing feelings of isolation or distance in the relationship and by ensuring that they feel warmth and love in the relationship. These aspects of the relationship have been found to be particularly

influential during later adolescence (Van Ryzin et al., 2012). It may be a considerable challenge to maintain these qualities of the relationship in the presence of externalizing problems, such as when using parenting strategies involving discipline in response to externalizing problems or conflicts may occur during the course of this. However, these challenges may be the reasons that treatment services are needed; “most families are doing the best they can under difficult circumstances” (p. 849, Bronfenbrenner, 1979) and the family-level supports that can be provided through treatment may help them overcome the obstacles that they face.

The findings related to the exploratory hypotheses involving externalizing problems and the adolescent-caregiver dynamics across adolescents with differing family-immigration histories offer information that is valuable in the treatment of Hispanic/Latinx adolescents. The results were not indicative of significant differences between the immigration-based groups in terms of the characteristics of the adolescent-caregiver dynamics or the relations that these variables have with externalizing problems. In terms of treatment, these findings suggest that the classification of the adolescent’s generation of immigration may not be directly impacting the adolescent-caregiver relationship. Although there may be unique stressors and experiences across these groups (Cervantes et al., 2013; Szapocznik et al., 2007), the findings did not suggest that these have an impact on the adolescent-caregiver relationship (at least from the adolescent’s perspective). It may be that each family structure faces differing challenges that are equally impactful, leading to limited differences in the quality of the relationships across the groups. It also appeared that the adolescent-caregiver relationship is related to externalizing problems in similar ways across groups. An adolescent’s assimilation has

been argued to have the effect of worsening externalizing problems by causing the adolescent's values to stray from the family values (Coatsworth et al., 2002; Cox et al., 2011; Szapocznik et al., 2007). If there are differences in values across immigration-based groups, they did not seem to impact the importance of the adolescent-caregiver relationship because healthier relationships were consistently indicative of fewer externalizing problems. The findings that externalizing problems showed possible elevations in 2nd-generation immigrant adolescents suggest that clinicians may see higher or lower levels of problems across groups. Clinical expertise and further research may identify which processes shape the blueprints of the Hispanic/Latinx family unit, whether these are culturally salient characteristics unique to the population or more general aspects of family functioning (e.g., deviancy of family members, structure of household). Identifying prototypal structures present across Hispanic/Latinx family units will allow interventions to be tailored to address the unique family dynamics that occur across Hispanic/Latinx families (Santisteban et al., 2013).

Conclusion

There is a heightened prevalence of externalizing problems within this Hispanic/Latinx adolescents (Johnson et al., 2017; Kann et al., 2018) and a need to understand sociocontextual and cultural influences that underlie these disparities (Singer, 2000; Szapocznik et al., 2007). This study provided an in-depth understanding of externalizing problems within Hispanic/Latinx adolescents by using a dimensional approach to conceptualize externalizing psychopathology and by applying constructs of Bronfenbrenner's bioecological theory (Bronfenbrenner, 2005). Externalizing problems are a broad spectrum of psychopathology that can be captured with a number of disorders

and through the symptoms of each of these disorders. Externalizing problems have significant relations with the adolescent-caregiver relationship dynamics, specifically with parenting practices or behaviors and the attachment or connectedness in the relationship. There appears to be relatively consistent characteristics in terms of adolescent-caregiver dynamics and externalizing problems based on the adolescent's generation of immigration, though there seemed to be elevations in externalizing problems associated with being a 2nd-generation immigrant adolescent. The adolescent-caregiver relationship has importance for adolescents with varying immigration histories and the healthy development and well-being of Hispanic/Latinx individuals depends on further understanding broad patterns of externalizing problems that can develop within this population as well as the social and cultural influences of development.

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