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Individual, Familial, and Sociocultural Determinants of Internalizing Psychopathology in Three At-Risk Samples

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Individual, Familial, and Sociocultural Determinants of Internalizing Psychopathology in Three At-Risk Samples

A dissertation submitted in partial satisfaction

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in Psychology

by

Naomi Viviana Rodas

2020

ABSTRACT OF THE DISSERTATION

Individual, Familial, and Sociocultural Determinants of
Internalizing Psychopathology in Three At-Risk Samples

by

Naomi Viviana Rodas
Doctor of Philosophy in Psychology
University of California, Los Angeles, 2020
Professor Bruce L. Baker, Chair

We aimed to examine *Processes* (i.e., parenting and early life stress), *Person* factors (i.e., child delay status, temperament, and ethnicity), and *Context* factors (i.e., socioeconomic status, acculturation, and familism) involved in the development of internalizing psychopathology. We advanced these aims in samples of children with or without intellectual disability from the Collaborative Family Study, children from the Early Head Start Research and Evaluation project, and children with autism spectrum disorder (ASD) from UCR's SEARCH Autism Resource Center.

In Study 1, we sought to examine longitudinally whether negative parenting and early life stress mediated the relationship between socioeconomic status (SES) and internalizing symptoms. We also sought to determine whether ethnicity (Latino vs. White) moderated these relationships. Negative parenting uniquely mediated the relationship between SES and

internalizing behavior problems. Ethnicity moderated the indirect effect from SES to internalizing behavior problems through negative parenting, wherein SES was inversely associated with negative parenting, which in turn was positively associated with internalizing behavior problems for White children, but not for Latino children.

In Study 2, we utilized latent growth curve modeling (LGCM) to examine the developmental trajectory of anxiety symptoms (ages 3-13) and to examine the individual and interactive effects of variables measured in early childhood (i.e., child delay status, temperament, ethnicity, and negative parenting) in predicting age 3 anxiety symptoms and change in anxiety. On average, anxiety symptoms increased overall from early childhood to adolescence. Child delay status and social fearfulness predicted initial levels of anxiety symptoms at age 3. Additionally, anxiety symptoms increased at a slower rate for Latino children as compared to White children. There was also a significant interaction effect between child delay status and negative parenting on change in anxiety symptoms age 3 to 13 years.

In Study 3, we examined the relationship between socioeconomic status and anxiety symptoms in children with ASD, and we examined the extent to which anxiety symptomatology varied by child ethnicity (Latino vs. White). Additionally, we examined a moderation model linking maternal acculturation/enculturation, familism, and child anxiety symptoms in Latino families. Socioeconomic status was inversely associated with child anxiety symptoms. We also found that Latino and White children with ASD did not differ in their anxiety symptom levels. Lastly, maternal familism moderated the relationship between enculturation and child anxiety in Latino families of children with ASD. The present dissertation findings inform early intervention targets for culturally diverse families of children at-risk for developing internalizing disorders.

The dissertation of Naomi Viviana Rodas is approved.

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2020

Dedication

Dedico mi tesis a Dios, a mi mamá (Elva Carriedo), a mi papá (Felipe Beltrán), y a mi esposo (Juan Rodas). Primeramente, me gustaría agradecer a Dios por todas las bendiciones que me han permitido alcanzar este logro académico. Gracias Ma, por tu apoyo incondicional a través de mis esfuerzos académicos. Tu fuerza y perseverancia me inspiran a continuar para adelante en los momentos en los cuales siente que no puedo. Para mi Pa, espero que estés mirando desde el cielo y te sientas orgulloso de la doctora en la cual soy. Me inculcaste tu amor hacia la educación y espero llevarlo conmigo por donde quiera que Dios me guié. Para mi Bubsky, estoy abundantemente bendecida de haber tenido un compañero tan increíble a mi lado durante toda esta jornada. Gracias por tus porras constantes, tus palabras de animo, tus oraciones, *date knights*, y tu apoyo durante los últimos cinco años. ¡¡Lo logramos!!

I dedicate this dissertation to God, my mother (Elva Carriedo), my father (Felipe Beltran), and my husband (Juan Rodas). First of all, I would like to thank God for all of the abundant blessings that have allowed me to get to this academic accomplishment. Thank you *Ma* (mom) for your unconditional support throughout my academic endeavors. Your strength and perseverance inspire me to continue pushing forward in those moments when I feel like I cannot. To my *Pa* (dad), I hope that you are looking down from heaven and are proud of the *doctora* I have become. You instilled in me your love of education and I hope to take that with me wherever God may lead me. To my Bubsky, I am so abundantly blessed to have had such an amazing partner by my side throughout this entire journey. Thank you for the constant cheerleading, words of encouragement, prayers, *date knights*, and support throughout the past five years. We did it!!

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SELECTED PRESENTATIONS

Rodas, N.V., Blacher, J., Baker, B.L. (2018). *A decade later: Children with ID or typical development and their families, from child age 3 to 13 years*. Paper presented in research symposium, Gatlinburg Conference on Research and Theory in Intellectual and Developmental Disabilities, San Diego, California.

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Rodas, N.V., Zeedyk, S.M., & Baker, B.L. (2016). *Negative parenting and parental mental health in children with or without developmental disability: The effects on internalizing behavior problems*. Paper presented in research symposium, Gatlinburg Conference on Research and Theory in Intellectual and Developmental Disabilities, San Diego, California.

Rodas, N.V. & Baker, B.L. (2015). *Emotion socialization and child emotion outcomes: Mother and father differences in children with or without ID.* Paper presented in research symposium, American Psychological Association Annual Convention, Toronto, Canada.

Rodas, N.V., Zeedyk, S.M., Baker, B.L., & Blacher, J. (2014). *Maternal affect and internalizing behavior problems in young children with or without Intellectual Disabilities.* Paper presented in a research symposium, American Psychological Association Annual Convention, Washington, D.C.

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Chapter 1

General Introduction

Internalizing disorders comprise the most common mental health concern among youth, with lifetime prevalence rates of 31% and 14% for anxiety and depressive disorders respectively (Merikangas et al., 2010). They tend to emerge during early childhood and, if left untreated, are associated with various negative sequelae later in development. For example, anxiety symptoms in early childhood have been shown to be a risk-factor for anxiety and depression disorders during adolescence and even into adulthood (Beesdo-Baum & Knappe, 2012; Bittner et al., 2007; Cole et al., 1998; Merikangas et al., 2010; Pine, Cohen, Gurley, Brook, & Ma, 1998). Anxiety also has a broader impact on social-emotional functioning for children. It has been implicated in sleep, physical, and academic difficulties over time (Alfano, Ginsburg, & Kingery, 2007; Mychailyszyn, Mendez, & Kendall, 2010). Depression has also been ranked as one of the top seven most costly illnesses among youth in the United States (Michaud et al., 2006). This is due to the social costs of impairment and functioning that are linked with depressive psychopathology. The profound impact that internalizing disorders have on the lives of children highlights the need to examine their development. The present dissertation focused on individual, familial, and sociocultural determinants of internalizing psychopathology. In the first study, we examined internalizing behavior problems broadly and in the second and third studies we focused on anxiety symptoms more specifically.

Trajectory patterns of internalizing behavior problems have not been as extensively investigated as those for externalizing disorders. There is some evidence that internalizing behavior problems are less stable than externalizing behavior problems across childhood (Leadbeater & Hoglund, 2009; Sterba, Prinstein, & Cox, 2007), but findings regarding the

stability of anxiety disorders across childhood have been inconsistent. Various studies have demonstrated that symptoms of anxiety remain relatively stable throughout development (e.g., Ialongo et al. 1995; Keller et al. 1992; Pine et al. 1998; Verhulst and van der Ende 1992). However, prospective longitudinal studies have reported estimates of stability ranging from 4% to 80% (e.g., Keller et al., 1992; Last, Perrin, Hersen & Kazdin, 1996; Newman et al., 1996). These discrepant findings may be due to the changes in expression of anxiety symptoms throughout development. For example, young children are likely to present with symptoms of separation anxiety, and while this cluster of symptoms typically decreases over time, symptoms of generalized anxiety become more prevalent later on in development (Broeren & Muris, 2009; Muris, Merckelback, Gadet, & Moulaert, 2000). Further research is necessary in examining the developmental course of internalizing disorders in children, as well as predictors of trajectory.

Furthermore, the depiction of the nation's youth is vastly transforming. This transformation is in part due to the dramatic increase in the Latino population throughout the country. Latino Americans account for 17% of the U.S. population and this percent is rapidly growing (U.S. Census Bureau, 2010). Fry and Gonzales (2008) reported that every one in five public school children are Latino, compared to one in eight children in the 1990s. What's more is that Latino youth present with higher risk of developing internalizing disorders such as anxiety and depression (Choi, Meininger, & Roberts, 2006; Saluja et al., 2004; Varela & Hensley-Maloney, 2009). Given the strong presence of Latino youth in the nation, coupled with their increased risk for psychopathology, it is imperative to examine the underlying mechanisms that are at play in the development of internalizing disorders for these youth.

Developmental psychopathology research endeavors to understand the etiological factors at play in the development of childhood behavioral and mental disorders. Cicchetti and Toth

(2009) encouraged researchers in the field to take on a multiple-levels-of-analyses approach in order to examine the interactive processes of etiological factors contributing to the development of child psychopathology. Research has demonstrated that internalizing disorders arise from a child's dispositional factors interacting with the environmental factors in which the child is developing (Zahn-Waxler, Klimes-Dougan, & Slattery, 2000). Dallaire and colleagues (2008) utilized Bronfenbrenner's Bioecological Systems Theory in order to simultaneously examine personal, familial, demographic, and community risk factors associated with depressive symptoms in children. Drawing from this literature, we similarly worked from the Bioecological Systems Theory framework in order to examine individual, familial, and sociocultural determinants of internalizing disorders in children from early childhood through adolescence (Bronfenbrenner, 1995, 1999; Bronfenbrenner & Ceci, 1994).

Bronfenbrenner's Bioecological Systems Theory

Bronfenbrenner's Bioecological Systems Theory, otherwise referred to as the Process-Person-Context-Time (PPCT) model is a dynamic framework which emphasizes the interactive process which occurs between an individual and his/her developmental context (Bronfenbrenner, 1995, 1999; Bronfenbrenner & Ceci, 1994). In this model, *Process* refers to the interactions between an individual and the environment (i.e. proximal processes), which occur over time. Bronfenbrenner posited that this is the primary mechanism through which human development occurs. *Person* refers to an individual's core characteristics that shape the developmental course. Bronfenbrenner highlighted three types of characteristics: dispositional, resource, and demand characteristics. Dispositional characteristics (e.g. age, gender, ethnicity) are those which can set proximal processes into motion. Resource characteristics (e.g. intelligence, experience, skills) are those that are required in order for proximal processes to effectively occur. Lastly, demand

characteristics (e.g. motivation, temperament, persistence) either function to foster or disrupt proximal processes. Further, within this framework, *Context* parallels the five interconnected systems that were first introduced in Bronfenbrenner's Ecological Systems Theory (1974). These include the microsystem, mesosystem, exosystem, macrosystem, and chronosystem from which an individual is operating. Lastly, *Time* is differentially referring to: micro-time (i.e. what is occurring during specific episodes of proximal processes), meso-time (i.e. how often the processes occur in an individual's environment), and macro-time (i.e. shifting expectancies/events that occur in the broader culture) (Bronfenbrenner & Morris, 2006). Working from this framework, we review prior literature examining the person factors (i.e. ethnicity, delay status, and temperament), process factors (i.e. parenting and early life stress), and context factors (i.e. socioeconomic status, acculturation, and familism) associated with internalizing psychopathology in children and adolescents.

Person: **Individual determinants of internalizing psychopathology**

Ethnicity. Ethnic minority status has been well documented as being associated with poorer mental health (e.g. Kennard, Mahtani, Hughes, Patel, & Emslie, 2006). Latino Americans specifically, have a higher likelihood of presenting with internalizing problems when compared to other ethnic groups (Cespedes & Huey, 2008; McDonald et al., 2005; Siegel et al. 1998; Umana-Taylor & Updegraff, 2007). Mikolajczyk and colleagues (2007) found that Latino American youth were twice as likely to be at-risk for depressive symptoms when compared to European American youth. Additionally, Latino American youth have also been demonstrated to present with more symptoms of anxiety when compared to European American youth (Ginsburg & Silverman, 1996; Pina and Silverman, 2004; Varela et al., 2004).

Researchers have begun to examine the underlying mechanisms through which ethnic minority status operates to produce higher rates of psychopathology in youth. Ethnic minorities are more likely to be exposed to environmental and social conditions that create a higher risk for developing internalizing symptoms. For example, children from ethnic minority status groups are disproportionately economically disadvantaged, as well as exposed to more stressful life events (Anderson and Mayes, 2010; Ramos, Jaccard, & Guilamo-Ramos, 2003). Additionally, with respect to Latino youth specifically, their cultural norms also play a role in the development of internalizing symptomatology. It has been commonly noted that Latino youth are taught to place their emotional needs secondary to those of their family and the collective group as a whole. Therefore, this emphasis on emotional containment likely prevents a child from understanding and being able to appropriately manage his/her internal state, ultimately leading to internalizing symptoms (Varela, Weems, Berman, Hensley, & Rodriguez de Bernal, 2007; Varela et al., 2004).

Delay Status. Individuals with intellectual disability (ID), aside from exhibiting impairments in intellectual and adaptive functioning, are also at heightened risk for other psychological disorders. Children with ID are up to four times as likely as typically developing (TD) children to meet criteria for a psychiatric disorder at any given time (Einfeld, Ellis, & Emerson, 2011; Emerson & Hatton, 2007). Among these, anxiety disorders have been found to be significantly higher in children with ID than in their TD peers (Dekker & Koot, 2003; Emerson, 2003; Green, Berkovits, & Baker, 2014). While there has been a focus on the elevated level of externalizing disorders in children with ID (Baker & Blacher, 2015; Baker, Neece, Fenning, Crnic, & Blacher, 2010), there is still much to learn about internalizing disorders in this population. Furthermore, few studies have examined trajectories of internalizing disorders in children with ID. Though there is some evidence that TD and ID youth show a similar

developmental course of internalizing symptoms during childhood and adolescence, children with ID have higher symptom levels (de Ruiter et al., 2007; Green et al., 2014). There is a need to longitudinally examine predictors of anxiety development in this population.

Furthermore, children with Autism Spectrum Disorder (ASD), in addition to presenting with core deficits in social communication and restricted and repetitive behaviors, also present with heightened risk of developing comorbid internalizing disorders (van Steensel, Bogels, & Perrin, 2011; Wood & Gadow, 2010). Anxiety disorders are prevalent in about 40% of youth under the age of 18 years with an Autism Spectrum Disorder (ASD) (Jennett, Vasa, & Hagopian, 2013). Though in children with ASD it is difficult to differentiate symptoms of anxiety from core symptoms of ASD, due to the overlap between anxiety and the diagnosis of ASD, many children with ASD experience a significant number of anxiety symptoms independent of their ASD symptomatology (Jennett et al., 2013). While research regarding the etiology of anxiety in ASD is continuing to develop, there is a need to examine how familial and sociocultural factors may also be implicated in the development of anxiety in these youth.

Temperament. Temperament traits have been regarded as the core of personality and have been shown to have important associations with developmental psychopathology. There are various key traits encompassing temperament, including: positive emotionality (i.e. variability in approach motivation, activity, and joy), negative emotionality (i.e. fearfulness and frustration/anger), and self-regulation (i.e. effortful attention which allows situation-appropriate modification of emotional responses and inhibition) (Gartstein & Rothbart, 2003; Putnam, Ellis, & Rothbart, 2001). Negative emotionality in early childhood has been found to be positively associated with internalizing behavior problems at later childhood (Rende, 1993). Additionally, anger/frustration have also been shown to predict internalizing disorders (Lengua, 2006; Nigg,

2006; Oldenhinkel, Hartman, De Winter, Veenstra, & Ormel, 2004; Rothbart & Bates, 2006). Fear, shyness, and emotional reactivity/inhibition have similarly been shown to be associated with concurrent and later anxiety problems (Colder, Mott, & Berman, 2002; Kagan, Snidman, Zentner, & Peterson, 1999; Prior, Smart, Sanson, & Oberklaid, 2000). These temperamental factors are thought to decrease an individual's ability to cope with emotional arousal, therefore, resulting in increased levels of anxiety.

Process and Context: **Familial and sociocultural determinants**

Parenting. Research on the etiology of internalizing disorders in children with typical development has indicated the importance of early parent-child relationships (Chorpita & Barlow, 1998; McLeod, Wood, & Weisz, 2007; Rubin & Mills, 1991; Wood, McLeod, Sigman, Hwang, & Chu, 2003). Hudson and Rapee (2000) reported observed interactions of mothers with anxious children to be significantly less positive and encouraging than those of mothers with non-anxious children, supporting findings from retrospective questionnaire studies that have shown a relationship between parental rejection and child anxiety (Arbel & Stravinsky, 1991; Gerlsma, Emmelkamp, & Arrindell, 1990). Parenting characterized as over solicitous, intrusive or controlling, and low in warmth has also been associated with greater child inhibition and anxiety (Chorpita & Barlow, 1998; Degnan, Almas, & Fox, 2010). Additionally, researchers have demonstrated that parenting is also linked with the development of depressive symptoms in youth. Parenting that is characterized as being harsh or controlling has been found to be associated with negative self-schemas, putting youth at increased risk for depression (McLeod, Weisz, & Wood, 2007; Stolz, Barber, & Olson, 2005). Prior research has also demonstrated that depressed children experience less consistent and harsher parenting when compared to non-depressed children (Kim et al., 2003).

Early Life Stress. In addition to parenting, a child's experiences of environmental stressors also have an impact on his/her well-being throughout development. The most widely accepted definition of stress has been that of Lazarus and Folkman (1984), which states, "Psychological stress involves a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his/her resources and endangering his/her well-being" (p. 19). However, given that children may not be developmentally capable of engaging in cognitive appraisal, Grant and colleagues (2003) developed the following definition of stress, "environmental events or chronic conditions that objectively threaten the physical and/or psychological health or well-being of individuals of a particular age in a particular society" (pg.499). They also distinguished between *stressors* (i.e. environmental experiences that define stress research) and *stress* (i.e. the environmental stressors themselves, as well as the range of processes set in motion by the exposure to stressors).

Research regarding the exposure to adverse/stressful experiences in childhood altogether, rather than as separable stressors, was prompted following the findings of the Adverse Childhood Experiences (ACE) study. This seminal study documented high levels of co-occurrence of multiple types of childhood adversities, as well as strong associations between exposure to adverse experiences in childhood and adult health outcomes (Dong et al., 2004; Edwards, Holden, Felitti, & Anda, 2003; Felitti et al., 1998). However, there has been a lack of consistency in the literature with regard to the definition of childhood adversity, otherwise known as early life stress (ELS). More recently though, McLaughlin (2016) defined childhood adversity as "exposure during childhood or adolescence to environmental circumstances that are likely to require significant psychological, social, or neurobiological adaptation by an average child and that represent a deviation from the expectable environment" (pg. 363). We worked from this

definition in order to examine ELS as a process factor involved in the development of child internalizing psychopathology.

The experience of ELS been well documented as being associated with negative physical and psychiatric health outcomes for individuals (Dohrenwend & Dohrenwend, 1974; Dohrenwend, 1998; Thoits, 2010). Children's experiences of ELS have been implicated in the etiology as well as the maintenance of internalizing disorders (e.g., Cicchetti & Toth, 1991; Grant et al., 2006). Researchers have posited that anxiety disorders develop from the paired association between a neutral stimulus and a traumatic event (see Murray, Creswell, & Cooper, 2009 for review). Experiencing stressors within the first five years of life has been shown to predict anxiety in adolescence, even after controlling for current adversity (Phillips et al., 2005). Children with anxiety have also been found to experience more stressful life events compared to non-anxious child (Goodyer, Wright, & Altham,1988). Moreover, there has also been research implicating ELS in the etiology of mood disorders. Researchers have demonstrated the association between stressful life events and increased risk of depressive symptoms in children (Berney et al., 1991; Compas, 1987; Williamson, Birmaher, Dahl, & Ryan, 2005). Kim and colleagues (2003) found that stressful life events longitudinally predicted increased levels of anxious and depressive symptoms in adolescents from seventh through twelfth grades. Given that there is a clear association between early life stress and the development of internalizing disorders, it is important to examine how these familial determinants work in conjunction with one another in longitudinally predicting internalizing disorders from early childhood and beyond.

Socioeconomic Status. The impact of socioeconomic status (SES) on internalizing disorders has been well documented for adults (e.g. Lorant et al, 2003; Everson, Maty, Lynch, & Kaplan, 2002). Individuals living in low SES households experience increased stress due to the

lack of material resources and diminished social supports, which in turn puts them at risk for increased prevalence of psychopathology. However, findings regarding the relationship between SES and internalizing disorders in children have been mixed. The bulk of the literature has demonstrated that youth from lower SES households are more likely to present with internalizing symptomatology than youth with high SES status (Lemstra et al., 2008; Ozer, Fernald, & Roberts, 2008). In a meta-analysis by Letourneau and colleagues (2013), findings revealed that lower levels of SES were significantly associated with higher internalizing behavior problems. Longitudinal research has shown that the effects of low household income on internalizing behavior problems are apparent for children as young as five years old (Bor et al., 1997). Additionally, experiencing poverty during early childhood has also been shown to predict symptoms of anxiety and depression during adolescence (e.g. Spence et al., 2002).

On the other hand, there have been studies demonstrating the opposite effect of SES on internalizing symptoms. For example, results from the National Health and Nutrition Examination Survey (NHANES) found that children from low-income households actually had a lower prevalence of anxiety disorders than those from wealthier households (Merikangas et al., 2010). Vine and colleagues (2012) found that household income was associated with various anxiety disorders in children. However, the directionality of the results varied depending on the specific type of anxiety, as well as depending on whether they measured household versus neighborhood income levels. Therefore, it appears that these discrepant research findings are at least partially due to the varied ways in which internalizing disorders are classified, as well as the variation in measurement of SES. Nonetheless, it is evident that SES is an important sociocultural determinant to consider when examining the development of internalizing psychopathology in youth.

Familism and Acculturation. Strong familial relationships among all members of the family have been shown to be one of the cornerstones of Latino culture (Smokowski, Bacallao, & Buchanan, 2009). Familism has been defined as a set of attitudes surrounding value, pride, and closeness in one's family (Marin & Marin, 1991). Given that this is one of the most influential factors for Latinos, family is seen as the primary source of emotional, instrumental, and informative support for these individuals. This strong sense of family orientation, cohesion, and obligation has been shown to be a protective factor in multiple domains of functioning (Smokowski et al., 2014; Vega, 1995). Smokowski and Bacallao (2007), found that familism was a buffer against mental health problems for adolescents. They found that adolescents with increased familism values presented with fewer internalizing symptoms, as well as higher self-esteem. However, there has also been some evidence to support that the pressure involved in holding values of familism may cause stress for adolescents. One study found that Latinas who had high levels of familism were at increased risk for internalizing disorders (Kuhlberg, Pena, & Zayas, 2010). These discrepant findings are likely due in part to individual differences in acculturation levels. As individuals become increasingly more acculturated, familism is thought to decrease (Gil, Vega, & Dimas, 1994). Therefore, it appears that in examining the effects of familism on child psychopathology, it is important to account for acculturation as well.

Acculturation is the process through which cultural change occurs when individuals from two different cultural groups come into contact (Berry, 1998; Redfield, Linton, & Herskovits, 1936). Berry (1980) described acculturation as the process that emerges when dominant and non-dominant cultural groups come into contact and conflict arises. This eventually results in adaptations in values and behaviors by one or both of the groups. Most often, individuals from the non-dominant cultural group adopt the values and behaviors present in the dominant society

(Smith & Guerra, 2006). However, more recently, acculturation has been shown to be multidimensional and involve both the incorporation of new cultural beliefs and practices (i.e., acculturation), as well the maintenance of traditional norms and values (i.e., enculturation; Berry, 2006). Multidimensional acculturation theory suggests that Latino individuals can acculturate and enculturate simultaneously (Cabassa, 2003). Therefore, acculturation and enculturation constitute separate/independent process, and are likely to differentially impact Latino youth mental health (Schwartz, Unger, Zamboanga, & Szapocznik, 2010). Acculturation also operates within multiple domains that are separate though related, through which cultural acquisition and heritage-culture retention occur (Schwartz et al., 2010). These domains include: an individual's practices (e.g. English vs. Spanish language acquisition/retention), cultural values (e.g. individualism vs. collectivism), and ethnic identity (e.g. identifying as American vs. as Latino/a). Additionally, individuals may adhere to some cultural changes in line with the dominant culture, but may retain other aspects more so line with their country of origin.

In general, prior research has demonstrated that acculturation has a negative impact on the well-being of Latino youth (see Gonzales, Knight, Birman, & Sirolli, 2004, for review). However, more recently the complexity concerning the effects of acculturation on mental health outcomes has come to light. The meaning of acculturation has evolved over time and this coupled with its complexity have helped to explain the mixed findings, with some research positing a positive relationship between acculturation and mental health, while others supporting a negative relationship (see Varela & Hensley, 2009 for review). There has been ample evidence demonstrating that acculturation has been linked to higher internalizing problems in Latino youth (Dawson & Williams, 2008; Gonzales et al. 2004; Lorenzo-Blanco, Unger, Ritt-Olson, Soto, & Baezconde-Garbanati, 2011). However, there has been some research demonstrating that the

relationship between acculturation and internalizing symptoms is more nuanced. Smokowski and Bacallao (2007) found that while longer residency in the United States was associated with lower self-esteem, adolescent involvement in non-Latino culture was a protective factor against internalizing symptoms. Further, high maternal acculturation has also been shown to predict reduced symptoms of depression in children (Dumka, Roosa, & Jackson, 1997). Therefore, there is a need to examine the relationship between acculturation, familism, and child internalizing disorders in a more integrative manner.

Proposed Studies

The goal of the proposed dissertation was to examine individual, familial, and sociocultural determinants of internalizing disorders in three at-risk samples. We examined parenting behaviors and early life stress as the *Processes* involved in the development of internalizing symptoms in children. The *Person* factors we sought to examine were child delay status, temperament, and ethnicity. Lastly, socioeconomic status, acculturation, and familism were the *Context* factors examined.

STUDY 1: *The longitudinal examination of mechanisms between socioeconomic status and internalizing symptoms in children.* The first study drew data from the toddlerhood, pre-kindergarten, and 5th grade follow-up time points of the Early Head Start Research and Evaluation (EHSRE) study. We sought to longitudinally examine the mechanisms through which socioeconomic status (SES) affects the development of internalizing symptoms in children from low SES households. We specifically examined whether negative parenting and early life stress mediated the relationship between SES and internalizing symptoms. We also sought to determine whether ethnicity (Latino vs. White) moderated these relationships.

STUDY 2: *Predictors of anxiety trajectories in children with or without Intellectual Disability (ID) from early childhood to adolescence*. The second study utilized data collected at child ages 3, 4, 5, 6, 7, 8, 9, and 13 drawn from the Collaborative Family Study, a longitudinal study focused on examining developmental psychopathology and familial processes in children with ID or TD. We sought to examine the effect person (child delay status, child temperament, and child ethnicity) and process (negative parenting) factors have on longitudinally predicting anxiety symptom trajectory in youth with or without ID from early childhood to adolescence.

STUDY 3: *The impact of familial and sociocultural factors on concurrent anxiety symptoms in children with autism spectrum disorder (ASD).* The final dissertation study utilized data from an autism-specific screening clinic held at UCR's SEARCH Family Autism Resource Center. We examined the impact of familial and sociocultural factors on concurrent anxiety symptoms in a sample of children with ASD. We first sought to examine the relationship between socioeconomic status and anxiety symptoms in children with ASD, as well as to examine the extent to which anxiety symptomatology varies by child ethnicity (Latino vs. White). Additionally, we sought to examine a moderation model linking maternal acculturation, familism, and child anxiety symptoms in Latino families.

Chapter 2

A longitudinal examination of mechanisms between socioeconomic status and internalizing symptoms in children (Study 1)

Abstract

Children from low socioeconomic status (SES) backgrounds are at developmental risk for increased psychopathology, including internalizing behavior problems. The current study sought to examine negative parenting and early life stress as mediators between SES and internalizing behavior problems, as well as determine whether ethnicity moderates these mediational relationships. Participants were 1,415 mothers and their children from the Early Head Start Research and Evaluation (EHSRE) study. We employed multiple mediation to discern whether negative parenting and early life stress collectively and uniquely mediated predictions of 5th grade internalizing behavior problems from SES measured during toddlerhood. We then examined the moderation of indirect effects by child ethnicity (Latino vs. White).

We found that negative parenting uniquely mediated the relationship between socioeconomic status and internalizing behavior problems. We also found that ethnicity moderated the indirect effect from SES to internalizing behavior problems through negative parenting, wherein SES was inversely associated with negative parenting, which in turn was positively associated with internalizing behavior problems for White children, but not for Latino children. Our findings highlight the importance of targeting the parent-child relationship in socioeconomically disadvantaged families, as well as the need for research aiding in the understanding of ethnic/cultural targets of intervention.

Introduction

Socioeconomic disadvantage has been widely demonstrated as having deleterious effects on child and adolescent well-being and development. Children from low socioeconomic status (SES) backgrounds are at developmental risk for increased psychopathology, including both internalizing and externalizing behavior problems (Letourneau et al., 2013; Riess, 2013). This relationship between low SES and internalizing behavior problems is evident even in children as young as five years old (Bor et al., 1997). Therefore, it is clear that SES is an important sociocultural determinant to consider when examining the development of internalizing disorders in youth. Further, there is now emergent research examining the mechanisms through which SES impacts the development of internalizing psychopathology in children. In the present study, we sought to explore two potential mechanisms: negative parenting and early life stress (ELS). Additionally, we sought to examine the differential effects of these mechanisms in White (non-Hispanic) and Latino children. Findings could help in targeting interventions to children who may be at the greatest risk for developing psychopathology.

Negative Parenting: Parenting, characterized by intrusiveness, rejection, controlling, and/or harsh behaviors, has been shown to be a process factor associated with increased internalizing disorders in children (e.g. McLeod et al., 2007; Wood et al., 2003). Parents experiencing economic disadvantage have other limited resources (e.g., time and social support), which are likely to result in a trickledown effect to their interactions with their children. Therefore, not surprisingly there is evidence that low SES predicts increased levels of negative parenting practices (e.g. Conger et al., 2010). Additionally, researchers are examining whether negative parenting mediates the relationship between SES and child internalizing behavior problems (Hosowaka & Katsura, 2017). In a meta-analysis, Grant and colleagues (2003), found

that negative parenting mediated the relationship between poverty and internalizing psychopathology in youth. In the present study, we expand on this research by examining whether ethnicity is a moderator of this mediational relationship, therefore, taking into account person factors in the development of internalizing symptoms across childhood.

Early Life Stress. Stressful life events early in development may also impact the development of internalizing psychopathology in children. Early life stress (ELS) encompasses exposure during childhood or adolescence to adverse circumstances that represent a deviation from the expected environment, which are likely to require significant adaptation on behalf of the child/adolescent (McLaughlin, 2016). These circumstances include parental loss, parental divorce, personal or caregiver physical illness, caregiver mental health difficulties, exposure to violence, maltreatment/neglect, and lack of encouragement and support (Bernstein et al., 2003; Kessler et al., 2010; Kliewer, 1997; McLoyd & Wilson, 1991; Romer, Barkmann, Schulte-Markwort, Thomalla, & Riedesser, 2002; Zavaschi et al., 2002). Experiencing ELS has been well documented as being associated with negative physical and psychiatric health outcomes for individuals (Dohrenwend & Dohrenwend 1974; Dohrenwend, 1998; Thoits, 2010). It has also been well documented as being implicated in the etiology of internalizing disorders (e.g., Cicchetti & Toth, 1991; Grant et al., 2006). Additionally, stressful life events more frequently occur in low SES households, as well as in ethnic minority groups (Hatch & Dohrenwend, 2007). Stressful life events have also been shown to explain most of the relationship between family income and depression in adolescents (Tracy, Zimmerman, Galea, McCauley, & Stoep, 2008). In the present study we expand on this research by simultaneously examining both negative parenting and early life stress as mediators between SES and internalizing behavior problems.

Ethnicity. Latino youth have been demonstrated to present with higher levels of internalizing symptoms than White youth (Pina and Silverman, 2004; Varela et al., 2004). Ethnic minority youth have been shown to be predisposed to environmental and social factors that lead to higher risk of internalizing psychopathology (e.g., stressful life events; Anderson and Mayes, 2010; Ramos, Jaccard, & Guilamo-Ramos, 2003). For Latino youth, specifically, cultural norms play a vital role in the development of internalizing symptomatology. For example, Latino youth are taught to contain their emotions in order to benefit the collective group's needs, thus leading them to internalize their emotions (Varela et al., 2004). Therefore, it is likely that these varied cultural experiences lead to differences in familial dynamics, which in turn have an effect on child well-being. We sought to examine whether mediational relationships between SES, negative parenting, and/or early life stress differentially impact Latino children compared to White children.

Research Questions and Hypotheses

We aimed to longitudinally examine the mechanisms through which SES impacts internalizing behavior problems in a sample of children and families enrolled in the Early Head Start Research and Evaluation (EHSRE) project (United States Department of Health and Human Services. Administration for Children and Families, 1996-2010). We examined negative parenting and early life stress as mediators between SES and internalizing behavior problems, and further examined whether ethnicity moderates these mediational relationships. We sought to answer the following research questions:

1) To what extent does socioeconomic status (SES) during toddlerhood relate to child internalizing behavior problems during 5th grade?

2a) To what extent does negative parenting at pre-kindergarten mediate the relationship between SES and internalizing behavior problems at 5th grade?

2b) To what extent does early life stress (ELS) at pre-kindergarten mediate the relationship between SES and internalizing behavior problems at 5th grade?

3a) To what extent does ethnicity moderate the mediational relationship between SES, negative parenting, and internalizing behavior problems?

3b) To what extent does ethnicity moderate the mediational relationship between SES, early life stress, and internalizing behavior problems?

Based on prior research, we expected SES to be significantly related to increased levels of internalizing behavior problems (e.g. Lemstra et al., 2008; Letourneau et al., 2013). We also expected that both negative parenting and early life stress would function as mediators between SES and internalizing behavior problems (Grant et al., 2003; Tracy et al., 2008). Additionally, we sought to explore whether ethnicity functions as a moderator in these relationships, though there was not a sufficient research base as to advance a hypothesis.

Method

Participants

Participants were 1,415 mothers and their children who were involved in the Early Head Start Research and Evaluation (EHSRE) study, conducted by Mathematica Policy Research (MPR) between 1996 and 2010, and funded by the Administration for Children, Youth, and Families. The dataset is public use and is made freely available by Child Care & Early Education Research Connections (United States Department of Health and Human Services. Administration for Children and Families, 1996-2010). Low-income families were recruited if they had pregnant mothers or children up to 12 months old at time of enrollment in their household. Participants were randomly assigned to either the program group, which received Early Head Start (n

=1,513), or the control group, which received community services as usual (n = 1,488). The two groups were comparable on baseline demographic characteristics (United States Department of Health and Human Services. Administration for Children and Families, n.d.). The full sample was comprised of 3,001 children and their families. The present sample was comprised of 1,415 children and families who: (1) had data for at least one key variable, (2) mother and/or father identified as Hispanic/Latino or White (non-Hispanic), and (3) data from biological mother and father were available.

Procedures

The EHSRE study was implemented across 17 sites. These locations represented a diverse racial/ethnic makeup, urban-rural location, program models, program auspice, and program experience in serving infants and toddlers. Baseline data were collected when participants applied to participate in Early Head Start. Most baseline data came from Head Start Family Information System (HSFIS) Program Application and Enrollment Forms that were completed by families at the time of program application. Some information on research status (program/control group assignment) and some characteristics of the applicant, mother, and focus child are from MPR's sample tracking system.

Follow-up interviews and assessments were conducted based on two different collection schedules. Each family's use of services and progress toward self-sufficiency were seen as likely to be a function of the amount of time since the family applied for Early Head Start services, so the interview schedule for these data was based on the number of months since random assignment. These data, which were categorized as Parent Services Follow-Up Interviews (PSI) were collected at 6, 15, and 26 Months after random assignment. These data contain information on (1) the use of services both in and out of Early Head Start (such as the receipt of home visits,

and of services related to case management, parenting, health, employment, and child care); (2) progress toward economic self-sufficiency (such as employment, welfare receipt, and participation in education and training programs); (3) caregiver health; and (4) children's health.

Data related to child and family development, seen as being a function of the increasing age of the focus child over time, were scheduled to be collected in line with the children's birth dates. These Parent Interviews (PI) were targeted for completion when children were 14, 24, and 36 months old. There were also two follow-up visits conducted when the children were in pre-kindergarten and when they were in 5th grade. These interviews obtained a large amount of information from the primary caregivers about their child's development and family functioning. This included completion of standardized measures regarding their child's as well as their own well-being. Additionally, information was recorded regarding the child's behavior and the family's home environment. Direct assessments also included standardized assessment batteries of the child's cognitive and academic functioning, as well as semi-structured parent-child interaction tasks. The present study utilized data from the parent interviews, child interviews, as well as direct parent-child assessments.

Measures

Mother's Education. Mothers were asked to report their highest grade completed at the 26-month follow-up visit. We utilized mother's education to measure socioeconomic status (SES) in the present study, which has similarly been utilized in prior EHSRE studies (e.g. Henninger & Gross, 2016). In the present sample, mothers' years of education ranged from 0 to 20 years completed.

Negative Parenting. Parent behavior was measured during a parent-child semi-structured play task conducted at the pre-kindergarten follow-up visit. This play task was adapted from the

Three Box coding scales used in the NICHD Study of Early Child Care (NICHD Early Child Care Research Network, 1999). The play task was videotaped, and child and parent behaviors were coded by child development research assistants. Research assistant-coders were trained and met weekly to assess reliability. Coders reached 85% agreement (exact or within 1 point) or higher with a "gold standard" coder prior to coding unique interactions. Additionally, 20% of all tapes were used to check coders' ongoing reliability. Four aspects of the parent's behavior with the child were rated on a 7-point Likert scale (1 = very low to 7 = very high) based on the quantity and quality of the observed behaviors.

The present study utilized the *intrusiveness* and *negative regard* scales. The intrusiveness scale measures the extent to which the parent exerts control over the child rather than acting in a way that recognizes and respects the validity of the child's perspective. Higher scores on intrusiveness indicate that the parent controlled the play agenda, did not allow the child to influence the focus or pace of play, grabbed toys from the child, or did not take turns in play with the child. The negative regard scale measures the parent's expression of discontent with, anger toward, disapproval of, or rejection of the child. High scores on negative regard indicate that the parent used a disapproving or negative tone, showed frustration, anger, physical roughness, or harshness toward the child, belittled the child, or threatened the child for failing at a task or not playing the way the parent desired the child to do so.

Early Life Stress Index. To measure early life stress (ELS), we created an index taking information from the parent interview conducted at the pre-kindergarten follow-up visit. Our index reflected similar circumstances as those captured in the household dysfunction category of the Adverse Childhood Experiences (ACE; Felitti et al., 1998). This category of the ACE encompassed questions regarding a child's exposure to substance use, mental illness, violence,

and criminal behavior (this subcategory was not included in the present index). We also included child and mother physical health given that prior researchers have identified physical illness as a type of childhood adversity (e.g. Kessler et al., 2010; Worsham et al., 1997). Therefore, we operationalized ELS as the experience of negative circumstances across five domains: exposure to substance abuse, exposure to violence, childhood physical health problems, mother physical health problems, and mother mental health difficulties.

During a semi-structured Parent Interview, mothers were asked, "Has (CHILD) been a witness to violence in the past year?" Mothers' answers recorded "Yes" to this question were assigned a code of 1, indicating violence present, and answers recorded as "No" were assigned a code of 0, indicating absence of violence. Mothers were also asked, "During the past year, have you lived in a household where someone had a problem with alcohol or drugs?" Mothers' answers recorded "Yes" were assigned a code of 1, indicating exposure to substance abuse, and answers recorded as "No" were assigned a code of 0, indicating absence of substance abuse exposure. Child physical health was measured utilizing an interview item that asked the mother, "Overall, since (THIS MONTH) of last year, would you say (CHILD)'s health has been…Poor, Fair, Good, Very Good, or Excellent?" Mother physical health was similarly measured by asking, "In general would you say that your health is… Poor, Fair, Good, Very Good, or Excellent?" This single-item measure of perceived health has been shown to predict morbidity and mortality across a range of diseases and populations (Idler & Benyamini, 1997). Ratings of "Fair" or "Poor" were assigned a code of 1, representing health adversity, and ratings of "Good", "Very Good" or "Excellent" were assigned a code of 0 (absence of health adversity). Prior studies have similarly dichotomized the self-reported health rating and have found it to be valid (McGee, Liao, Cao, & Cooper, 1999; Villodas, Litrownik, Newton, & Davis, 2015).

Maternal mental health was measured utilizing the Center for Epidemiological Studies Depression (CES-D) Scale (Radloff, 1977). A short form of the CES-D consisting of 12 out of the usual 20 self-report items was used. This modified CES-D has been found to be valid and correlate highly with the full CES-D (Chapleski, Lamphere, Kaczynski, Lichtenberg & Dwyer, 1997; Poulin, Hand, & Boudreau, 2005; Ross, Mirowsky, & Huber, 1983). Each symptom was coded on a scale ranging from 0 (symptom experienced less than 1 day in the past week) to 3 (symptom experienced 5-7 days in the past week). The scoring ranges from 0-36, with higher scores indicating greater levels of depression, and a recommended a clinical cutoff of 10 or higher. We assigned a code of 1, indicating maternal mental health adversity, to mothers at or above the clinical cutoff, and a code of 0 to those below. Dichotomized life stressors were combined into an index defined as "Early Life Stress", so that scores ranged from 0 (no early life stressors present) to 5 (all five early life stressors present).

Self-Description Questionnaire (SDQ; Marsh 1990; Pollack et al. 2006). To assess child internalizing behavior problems, children completed the SDQ during the 5th grade follow-up. The SDQ provides information about a child's perceptions of her or his own academic and social competencies and problem behaviors. Children were asked by an assessor to rate the degree to which a statement (e.g., "I feel sad a lot of time") was "not at all true," "a little bit true," "mostly true," or "very true." The present study utilized the *Sad/Lonely/Anxious* subscale, which measures internalizing behavior problems such as feeling sad, anxious, frustrated, ashamed of mistakes, and worrying about school and friendships. The SDQ has repeatedly been identified as a measure with strong psychometric and theoretical construct properties (Gable, 1998; Isonio, 1998). The internal consistencies reported for the SDQ scales range from .78–.81 (Marsh, 1990).

Data Analytic Plan

We first examined whether socioeconomic status (SES) in toddlerhood predicted internalizing behavior problems in 5th grade. Next, we examined whether negative parenting (at pre-kindergarten) and early life stress (at pre-kindergarten) mediated the relationship between SES (at toddlerhood) and internalizing behavior problems (at 5th grade), controlling for child sex and program status (i.e. enrolled in Early Head Start vs. control group). We employed multiple mediation with bootstrapping in Mplus 8.0 (Muthen & Muthen, 1998-2017), to discern whether negative parenting and early life stress collectively and uniquely (i.e., controlling for the other mediator) mediated predictions of 5th grade internalizing behavior problems from SES measured during toddlerhood. We used 10,000 bootstrap simulation samples, which yielded 95% bias-corrected (BC) confidence intervals (CI's) for the point estimates of the indirect effects. Bootstrapped CI's for indirect effects are statistically more powerful than traditional mediation techniques (Zhao, Lynch, & Chen, 2010).

We then examined the moderation of indirect effects from SES measured at toddlerhood to 5th grade internalizing behavior problems through negative parenting and early life stress (in pre-k) by child ethnicity (Latino vs. White). The model simultaneously calculated (1) path coefficients for the direct effects from all predictors (i.e. SES, child ethnicity, child ethnicity x SES interaction term, and the covariates) to all pre-k mediators (i.e. negative parenting and early life stress); (2) path coefficients from SES, both mediators (i.e. negative parenting and early life stress), and all covariates to 5th grade internalizing behavior problems; (3) point estimates of the conditional indirect effects (i.e., indirect effects for Latino and White children) from SES to internalizing behavior problems through each mediator; and (4) the difference between the conditional indirect effects (i.e., the index of moderated mediation; Hayes, 2015). Again, we used

95% bias-corrected (BC) confidence intervals (CI's) for the point estimates of the conditional indirect effects and the difference between these effects were calculated using 10,000 bootstrap simulations (statistical significance is assumed when the interval excludes zero). Models were estimated using the full information maximum likelihood (FIML) estimator in Mplus, which allows the inclusion of participants with only partial data present.

Results

Demographics

Table 1-1a shows participant demographics at child baseline by child ethnicity (White or Latino), and Table 1-1b shows correlations among model variables. The present sample of children was 53% male. Mothers' mean age at baseline was 23.7 years. Additionally, 46.7% of families were above the poverty line. White mothers were significantly more likely to have a high school education or higher than Latina mothers. White mothers were, on average, slightly younger than Latina mothers. They also engaged in slightly more negative parenting practices compared to Latina mothers. White children, on average, experienced higher levels of early life stress than Latino children. We also included descriptive information regarding the early life stress index in Table 1-2, Table 1-3, and Figure 1-1.

Prediction and Mediation of Internalizing Behavior Problems

We first examined whether socioeconomic status (SES) in toddlerhood predicted 5th grade internalizing behavior problems. We entered program status (Early Head Start vs. control) and child sex into all analyses, as these were each related to some of our key variables. Child sex was significantly associated with negative parenting (B = 0.10, SE = 0.03, $p < .01$), whereby mothers of boys engaged in higher levels of negative parenting. Additionally, girls demonstrated higher levels of internalizing behavior problems than boys (B = -0.17, SE = 0.04, $p < .001$).

Moreover, program status was inversely associated with early life stress (ELS; B = -0.08, SE = 0.04, $p < .05$); children in the Early Head Start program experienced lower levels of ELS. Furthermore, there was a significant total effect (i.e., not including negative parenting and early life stress) of SES on 5th internalizing behavior problems, while controlling for program status and sex (B = -0.05, SE = 0.01, $p < .001$). Socioeconomic status in toddlerhood was negatively associated with internalizing behavior problems in late childhood (Table 1-4). Next, we examined whether Pre-K negative parenting and early life stress mediated predictions of 5th grade internalizing behavior problems from SES in toddlerhood. Negative parenting, but not early life stress, was found to significantly partially mediate predictions. First, there was a significant total effect of SES on 5th grade internalizing behavior problems, while controlling for program status and sex, and excluding negative parenting and early life stress (B = -0.05, SE = 0.01, $p < .001$). Second, the predictor was related to the mediator: SES positively predicted negative parenting in Pre-K (B = -0.06, SE = 0.01, $p < .001$). Next, negative parenting predicted the outcome: negative parenting positively predicted 5th grade internalizing behavior problems (B = 0.10, SE = 0.05, $p < .05$). Finally, there continued to be a significant direct effect of SES on 5th grade internalizing behavior problems with inclusion of the mediators (B = -0.04, SE = 0.01, $p < .001$).

We also examined the indirect effects of SES on internalizing behavior problems through negative parenting and early life stress (i.e., not conditioned on child ethnicity). We calculated the total and specific indirect effects of SES in toddlerhood on 5th grade internalizing symptoms through negative parenting and early life stress using 10,000 bootstrapped sample, which yielded 95% BC confidence intervals for each indirect effect. The total indirect effect (i.e., the point estimate difference between the total effect and direct effect through both mediators) marginally

differed from zero (Table 1-4). Additionally, there was a significant negative indirect effect through negative parenting (Table 1-4). Specifically, fewer years of maternal education predicted higher levels of negative parenting in Pre-K, which in turn predicted higher levels of internalizing behavior problems in 5th grade. There was not a significant indirect effect of early life stress; thus, early life stress in Pre-K did not mediate the relationship between SES in toddlerhood and internalizing behavior problems in 5th grade.

Moderated Multiple Mediation by Child Ethnicity

Next, we evaluated moderation of the indirect effects of SES in toddlerhood on 5th grade internalizing behavior problems through negative parenting and early life stress measured in pre-kindergarten by child ethnicity (White vs. Latino), while controlling for program status and sex. Path coefficients generated by this model are presented in Figure 1-3. There was a significant negative conditional indirect effect through negative parenting for White children, but not Latino children (Table 1-5). For White children, socioeconomic status was negatively correlated with negative parenting, which in turn positively correlated with internalizing behavior problems. A post hoc test of the difference between the conditional indirect effects (i.e., index of moderated mediation) revealed that the indirect effect through negative parenting significantly differed between White and Latino children. Furthermore, there weren't any significant conditional indirect effects through early life stress (Table 1-5).

Discussion

We examined the mechanisms through which socioeconomic status (SES) impacts internalizing behaviors problems. In a prospective longitudinal study from early to late childhood, we evaluated negative parenting and early life stress (ELS) as collective and unique mediators of predictions of internalizing behavior problems from socioeconomic status. Further,

we examined whether ethnicity moderated the indirect effects of negative parenting and early life stress. We addressed important gaps in the literature by expanding on the growing literature examining the mechanisms through which socioeconomic status impacts emotional functioning in children. We also sought to understand whether these mechanisms differ in Latino versus White families.

First, we corroborated that SES longitudinally predicted internalizing psychopathology from early childhood well into late childhood. This is in line with prior literature which has also found that low socioeconomic status is associated with higher levels of internalizing symptoms in children and youth (Letourneau et al., 2013; Riess, 2013). Next, we found that negative parenting uniquely mediated the relationship between socioeconomic status and internalizing behavior problems. More specifically, we found that lower levels of maternal education were predictive of higher levels of negative parenting, which in turn predicted higher levels of internalizing behavior problems. There is growing evidence that negative parenting is a mechanism through which SES is associated with poor psychopathology in youth (e.g., Grant et al., 2003), and the present study's findings further support this theory. Caregivers in low SES households are likely to have fewer resources, such as time and information regarding developmentally appropriate interactions with their children. These limited resources are likely contributing to engaging in more negative parenting practices.

Early life stress did not significantly mediate the relationship between socioeconomic status and internalizing behavior problems. This was surprising given that prior research has found stressful life events to mediate the relationship between SES and depressive symptoms (e.g., Tracy et al., 2008). Phillips and colleagues (2005) also found that experiencing stressors within the first five years of life predicted anxiety in adolescence. These discrepant findings

could be attributed in part to the fact that, while prior research examined depressive or anxious symptoms specifically, we examined internalizing behavior problems more broadly. It is also possible that only certain early life stressors are predictive of internalizing psychopathology. There is a need for further investigation of these processes in order to tease apart whether there may be critical age periods and/or experiences that have robust long-term effects on a child's social-emotional functioning.

We also found that ethnicity moderated the indirect effect from socioeconomic status to internalizing behavior problems through negative parenting. Specifically, socioeconomic status was inversely associated with negative parenting, which in turn was positively associated with internalizing behavior problems for White children, but not for Latino children. It may be that in Latino families there are contributing factors buffering the effect of socioeconomic status on negative parenting. For example, *familismo* has been shown to be a buffer in Latino families and may also be at play here (e.g., Williams et al., 2007). It is possible that having a close-knit family may lead to mothers having higher levels of social and instrumental support. This in turn may help Latina mothers, regardless of their socioeconomic status, to engage in fewer negative parenting behaviors when interacting with their children. It may also be the case that Latina mothers in the present sample provided more autonomy (i.e., not as intrusive) during the play interactions with their child compared to White mothers.

Limitations and Future Directions

The present findings should be interpreted in the context of several limitations. First, given the target population of the Early Head Start Research and Evaluation project, the present sample was made up of families with primarily low socioeconomic status. Thus, it is possible that the mediational relationship between socioeconomic status and internalizing

psychopathology through negative parenting may not be present in families with middle to high SES. We also did not have a standardized measure of early life stress (ELS), and thus an aggregated index was created. While prior studies have similarly utilized this methodology, further research examining ELS as a potential mediator between SES and internalizing behavior problems utilizing a standardized measure is necessary. Lastly, we did not have specific information regarding whether children in the sample met criteria for a specific internalizing disorder (e.g., MDD or GAD). Future research could examine whether the relationships found in this study would differ when the child presents with depressive symptoms versus symptoms of anxiety.

Conclusions and Implications

We utilized a longitudinal design with multi-informant, multi-method measurement to examine early life stress and negative parenting as mediators of the relationship between socioeconomic status and internalizing behavior problems, from early through late childhood. We also examined whether these mediational relationships differed between White and Latino families. Our findings highlight the importance of targeting the parent-child relationship in early childhood, particularly in low socioeconomic status households, in order to prevent negative sequelae such as internalizing psychopathology later in development. Additionally, given the differential relationship between socioeconomic status and negative parenting between White and Latino families, it is important to better understand what buffers are at play in Latino families, as these may be plausible targets of intervention for other ethnic groups. As noted, Latino caregivers may experience higher levels of social/instrumental support regardless of their levels of SES, and thus White caregivers may also benefit from interventions targeting their social support network. Last, given the role of mediating pathways in the relationship between

socioeconomic status and internalizing psychopathology throughout development, further examination of other mediating factors may help to inform targets of intervention for economically disadvantaged children and adolescents.

Table 1-1a. EHSRE study demographic characteristics by ethnicity (White, non-Hispanic and Hispanic/Latino).

	White (Non-Hispanic) (N= 848)	Hispanic/Latino (N= 567)	*t* or x^2
Child Sex (% Male)	52.5	52.8	x^2= 0.01
Mother's age	23.3 (5.3)	24.5 (6.1)	*t*= -3.67***
Mother's education (% having less than high school education)	30.7	70.3	x^2= 207.82***
Negative Parenting Composite Score	1.42 (.56)	1.34 (.47)	*t*= 2.39*
Early Life Stress Index Score	1.95 (.73)	1.63 (.78)	*t*= 7.89***

Note. *p<.05, **p<.01, ***p<.001

Table 1-1b. Correlations among key variables

	1	2	3	4	5	6	7
1. Child Ethnicity	1						
2. Socioeconomic Status	-.42***	1					
3. Negative Parenting	-.09**	-.01	1				
4. Early Life Stress	-.16***	.13***	-.01	1			
5. Internalizing Behavior Problems	.14***	-.17***	.07$^+$	-.04	1		
6. Program Status	.00	-.00	.00	-.05*	.02	1	
7. Child Sex	.00	.00	.09**	-.03	-.12**	.00	1

Note. $^+$ p<.10 *p<.05, **p<.01, ***p<.001

Table 1-2. Frequency of individual early life stressors experienced by children in EHSRE.

Early Life Stressors	**Percentage of Children**
Exposure to substance abuse	6.6%
Child Witnessed Violence	7%
Mother physical health poor/fair	30.2%
Child physical health poor/fair	57.6%
Mother mental health (depression) above clinical cutoff	28.2%

Table 1-3. Descriptives of Early Life Stress Index Score in EHSRE.

Number of Early Life Stressors Experienced	**Percentage of Children**
0	7.6%
1	29.3%
2	46.8%
3	13.5%
4	2.1%
5	0.6%

Figure 1-1. Distribution of Early Life Stress Index Score in EHSRE.

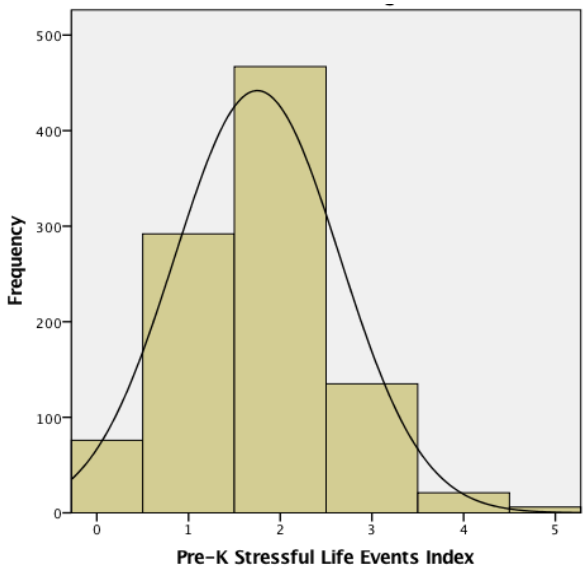

Table 1-4. Mediation of mother's education (SES) on internalizing symptoms through negative parenting and early life stress.

			95% BC Bootstrap CI	
	Point Est.	SE	Lower	Upper
Indirect effect through Negative Parenting	**-0.006**	**0.003**	**-0.013**	**-0.001**
Indirect effect through Early Life Stress	0.000	0.001	0.000	0.003
Total Indirect Effect	-0.006	0.009	-0.013	-0.001
Total Effect of Mother's Education	**-0.046**	**0.009**	**-0.063**	**-0.028**

Note: Boldface indicates significant effects

Table 1-5. Indirect effects of mother's education (SES) on internalizing symptoms through negative parenting and early life stress conditioned by child ethnicity.

			95% BC Bootstrap CI	
	Point Est.	SE	Lower	Upper
Negative Parenting				
White Children	**-0.006**	**0.003**	**-0.013**	**-0.001**
Latinx Children	0.001	0.001	0.000	0.003
Index of Moderated Mediation	**0.007**	**0.003**	**0.001**	**0.014**
Early Life Stress				
White Children	0.000	0.001	0.000	0.003
Latinx Children	-0.001	0.001	-0.001	0.000
Index of Moderated Mediation	-0.001	0.001	-0.005	0.001

Note: Boldface indicates significant effects

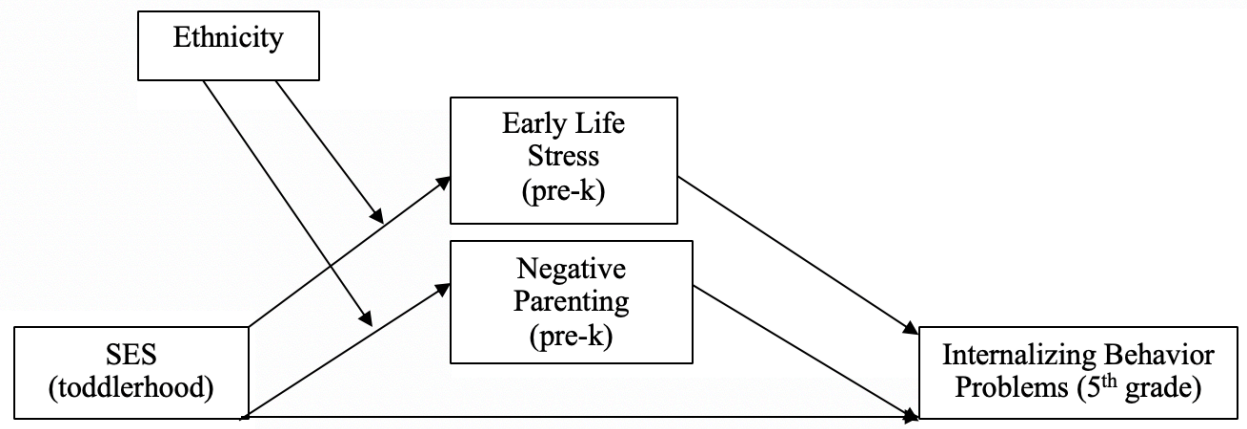

Figure 1-2. Conceptual model of moderated multiple mediation analysis.

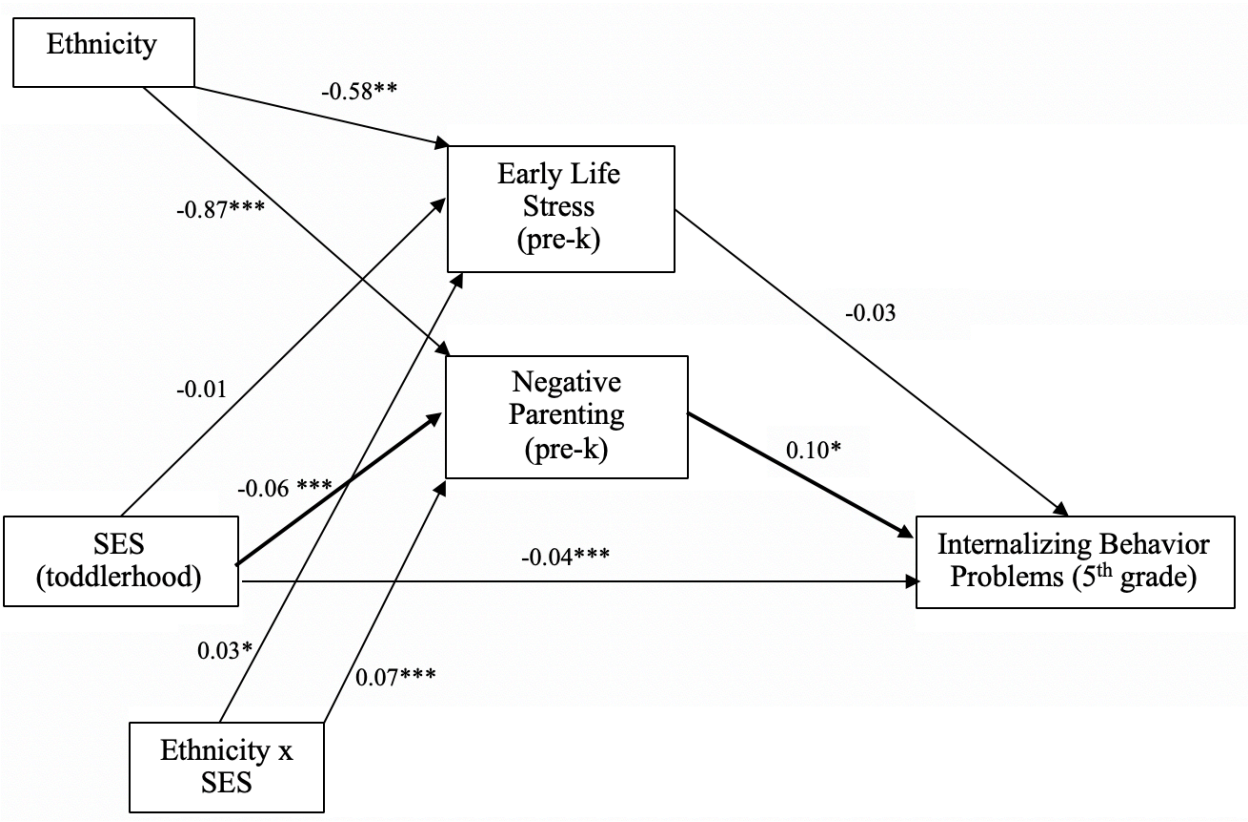

Figure 1-3. Path coefficients estimating moderation by ethnicity of indirect effects from baseline SES to 5th grade internalizing behavior problems through pre-k negative parenting and early life stress, controlling for child program status and child sex.
Note: Numbers shown reflect unstandardized beta coefficients; *p<.05, **p<.01, ***p<.00

Chapter 3

Predictors of anxiety trajectories in children with or without ID from early childhood to adolescence (Study 2)

Abstract

Anxiety disorders are among the most common mental health concerns for youth, and have a widespread impact on social-emotional functioning. The current study aimed to examine the development of anxiety in youth with or without intellectual disabilities (ID). The focus was on the effect child delay status, temperament, ethnicity, and/or negative parenting have on predicting anxiety symptom trajectory from early childhood to adolescence. Participants were 177 families in the Collaborative Family Study, a longitudinal study of youth with or without ID. We employed latent growth curve modeling (LGCM) to examine the developmental trajectory of anxiety symptoms (ages 3-13) and to examine the individual and interactive effects of variables measured in early childhood in predicting age 3 anxiety symptoms and change in anxiety.

LGCM revealed that anxiety symptoms increased overall from early childhood to adolescence. Child delay status predicted initial levels of anxiety symptoms; children with ID presented with higher levels of anxiety symptoms compared to typically developing (TD) children. Higher levels of social fearfulness were also associated with more anxiety at age 3. Anxiety symptoms increased at a slower rate for Latino children as compared to White children. There was also a significant interaction effect between child delay status and negative parenting on change in anxiety symptoms age 3 to 13 years. Our findings help to inform early intervention targets for culturally diverse families of children with or without ID. These targets of intervention could help in preventing the negative sequelae that result from anxious symptomatology.

Introduction

Developmental Delay Status and Anxiety. Children with intellectual disability (ID), aside from presenting with deficits in cognitive and adaptive functioning, also present with higher rates of comorbid psychopathology than their TD peers (Baker & Blacher, 2015; Einfeld, Ellis, & Emerson, 2011; Emerson & Hatton, 2007). Studies have found that anxiety disorders are significantly more prevalent in children with ID (Deb, Thomas, & Bright, 2001; Green et al., 2014; Meltzer, Gatward, Goodman, & Ford, 2000). However, few studies have examined trajectories of internalizing disorders in youth with ID. While there is some evidence that TD and ID youth similarly demonstrate increases in anxiety symptoms throughout childhood and adolescence (e.g. de Ruiter, Dekker, Verhulst, & Koot, 2007; Green et al., 2014), further study of the developmental course is needed. We know that anxiety has a broad impact on an individual's socioemotional functioning (e.g. Alfano et al., 2007). The examination of early risk factors for heightened anxiety symptoms throughout development could help to inform early interventions for this population, which in turn could help in preventing the negative sequelae that result from anxious symptomatology.

Temperament and Anxiety. An individual's temperament has also been shown to be implicated in the development of anxiety. Negative emotionality in early childhood has been found to be positively associated with internalizing behavior problems in later childhood (Rothbart & Bates, 2006). Additionally, anger/frustration have also been shown to predict internalizing disorders (Oldehinkel, Hartman, De Winter, Veenstra, & Ormel, 2004). Fear, shyness, and emotional reactivity/inhibition have similarly been shown to be associated with concurrent and later anxiety problems (Colder, Mott, & Berman, 2002; Prior, Smart, Sanson, &

Oberklaid, 2000). These temperamental factors are thought to decrease an individual's ability to cope with emotional arousal, therefore, resulting in increased levels of anxiety.

Ethnicity and Anxiety. In addition, ethnic minority status is an important variable that affects the development of psychopathology in youth. Research with typically developing youth has found that Latino American youth present with more symptoms of anxiety when compared to White youth (Pina and Silverman, 2004; Varela et al., 2004). There is a need to examine whether these phenomena arise in children with ID as well. Therefore, we seek to examine how individual characteristics such as child delay status and ethnicity interact with one another in predicting trajectories of anxiety symptoms. This will ultimately help in targeting interventions toward youth who may be most at-risk early on in their development.

Parenting and Anxiety. Aside from examining intrinsic, person factors, it is also important to examine proximal external processes that influence the development of psychopathology. Prior research has demonstrated the relationship between negative parenting behaviors and anxiety symptoms in TD children (McLeod et al., 2007; Wood et al., 2003). Furthermore, parents of children with ID have been found to display higher levels of intrusive and negative parenting behaviors when compared to parents of children with TD (Blacher, Baker, & Kaladjian, 2013; Brown, McIntyre, Crnic, Baker, & Blacher, 2011; Rodas, Zeedyk, & Baker, 2016). Given that youth with ID appear to be at heightened risk for comorbid psychopathology, as well as for increased levels of negative parenting, it is important to examine whether parenting behaviors in early childhood have longitudinal effects on anxiety symptomatology. The current study expanded on the existing literature by examining the developmental trajectory of anxiety, as well as child and parent level predictors of anxiety symptom trajectory, in Latino and White children with or without ID.

Research Questions and Hypotheses

This study examined the effect person (child delay status, child temperament, and child ethnicity) and process (negative parenting) factors have on longitudinally predicting anxiety symptom trajectory in youth with or without ID from early childhood to adolescence. The aims were: (1) to identify the developmental trajectory of anxiety symptoms from early childhood through adolescence, from 3 to 13 years of age; (2) to examine the extent to which anxiety symptom trajectory from early childhood through adolescence was predicted by (a) child delay status, (b) child temperament, (c) child ethnicity (Latino vs. White), and/or (d) negative parenting; (3) to investigate whether child delay status moderated the effects of negative parenting and ethnicity on trajectories of anxiety symptoms over time.

Based on prior research, we expected that children with ID would have more symptoms of anxiety than TD children. However, we expected that the *trajectories* of anxiety symptoms throughout development would be similar for the two groups (Green et al., 2014). We expected that dimensions of child temperament related to negative emotionality would be associated with increased levels of anxiety symptoms over time (Lengua, 2006; Oldehinkel et al., 2004). We also expected that Latino children with ID would present with the highest levels of anxiety. Lastly, we expected that negative parenting would relate to higher rates of anxiety symptoms, and more so for children with ID.

Method

Participants

Participants were 177 families who participated in the Collaborative Family Study, a longitudinal study conducted at three universities in Southern California and Central Pennsylvania. We studied family processes in youth with ID or TD, from child age 3 through 13

years of age. The sample was comprised of families for whom there were at least two data points available over these years. Additionally, given the aims of the present study, we constrained the sample to participants from White (non-Hispanic) or Latino ethnic groups. Children who were biracial, half Latino, were included in the Latino group (9% of the sample). Families of children with ID were recruited at child age 3 years from agencies that provided diagnostic and intervention services for persons with intellectual disabilities. Children with autism were excluded from the study at recruitment. Families of children with typical development (TD) were recruited through local preschools and daycare programs. Children were included in the ID sample if, at their age 5 laboratory visit, they were determined to have: (a) an IQ in the clinical or borderline range for ID, below 85 on the Stanford-Binet Intelligence Scale (Thorndike, Hagen, &Sattler, 1986), and (b) a standard score below 85 on the Vineland Adaptive Behavior Scales (VABS; Sparrow, Cicchetti, & Balla, 2005). We combined those with IQs below 70 and those with IQs ranging from 71-84 (i.e., in the borderline range) in the ID group, using DSM IV criteria (APA, 2000). This decision was based on prior research demonstrating similarities in the difficulties faced by those with borderline intellectual functioning and those with ID (DSM-IV-TR, APA, 2000; Fenning, Baker, Baker, & Crnic, 2007; Van der Molen, Henry, & van Luit, 2013). Participants in the TD group had an IQ of 85 or above on the Stanford-Binet Intelligence Scale, regardless of VABS score, and no previous history of a developmental delay or other disability.

Procedures

The Institutional Review Boards of the participating universities approved study procedures. Participating mothers provided informed consent and the children provided assent as age-appropriate. The child's intellectual and adaptive functioning levels were assessed during a

research center visit at child age 5. Though we did obtain a measure of IQ at age 3, we elected to use the age 5 Stanford-Binet score due to its increased reliability and validity in measuring child IQ. Parenting data were coded from observations that were conducted in the lab at child age 3 years. Child temperament was assessed via mother's report at child age 3. Mothers completed measures of child anxiety symptoms at child ages 3, 4, 5, 6, 7, 8, 9, and 13 years. Families received an honorarium for their participation.

Measures

Stanford-Binet Intelligence Scale, 4th Edition (Thorndike, et al., 1986). This widely used instrument is particularly well suited for evaluating children with ID, because the examiner adapts the starting points according to the child's developmental level. The eight sub-tests most appropriate for 5-year-olds were administered (i.e., Vocabulary, Comprehension, Absurdities, Pattern Analysis, Copying, Quantitative, Bead Memory, and Memory for Sentences). The composite standard IQ score (M = 100; SD = 15) was used. High internal consistency has been reported (Glutting, 1989), and there is sufficient evidence for validity, as reported in the technical manual (Thorndike et al., 1986).

Vineland Adaptive Behavior Scales (VABS; Sparrow, Cicchetti, & Balla, 2005). To assess child adaptive functioning, the VABS was administered to mothers as a semi-structured interview at child age 5. The overall adaptive composite (M = 100; SD = 15), which included communication, daily living skills and socialization domains, was utilized. The VABS has an internal consistency from .75 to .80 and Cronbach's alpha of .93 (Sparrow et al., 2005).

Child Behavior Checklist (CBCL) for Ages 1½–5 years and Ages 6–18 years (Achenbach, 2000; Achenbach & Rescorla, 2001). To assess child anxiety symptoms, mothers completed the CBCL at child ages 3, 4, 5, 6, 7, 8, 9 and 13. Two parent versions of the CBCL were used: the

preschool version at child ages 3 through 5 years (for ages 1.5–5 years; 99 items), and the youth version at child ages 6 through 13 years (for ages 6–18 years, 113 items). Each item is rated as: 0 (not true), 1 (somewhat or sometimes true), or 2 (very true or often true). The CBCL yields a total problem score, broadband externalizing and internalizing scores, seven narrow-band scales, and DSM-oriented scales. The present study utilized T scores for anxiety problems (M = 50 and SD = 10). The CBCL subscales have been shown to have good validity and internal consistency, with alpha coefficients ranging from .78 to .84.

Parent-Child Interaction Rating System (PCIRS; Belsky, Crnic, & Gable, 1995). Negative parenting was coded from a lab observation of mother and child. A number of parent, child, and dyadic behaviors were videotaped during free play, three problem-solving tasks, and clean up. Pairs of coders rated each videotape. Each of the behaviors was rated on a 5-point Likert scale (1=not at all characteristic, 5= highly or predominantly characteristic). The scale considered both the frequency as well as the intensity of the expressed behavior or affective expression. Reliability was defined as a criterion of over 70% exact agreement with the primary coder and 95% agreement within one scale point.

The present study examined the dimensions of Negative Affect and Intrusiveness. The dimension of *negative affect* referred to the verbal and behavioral expression of negative emotion, disapproval, and hostility. *Intrusiveness* referred to imposition of the mother's agenda on the child despite signals from the child that a different activity, level, or pace of interaction was needed. The dimension scale scores were converted to z scores, which were combined to create the Negative Parenting composite (Negative Affect + Intrusiveness). These factors have been established and replicated through factor analyses conducted in several different labs

(Woodworth, Belsky & Crnic, 1996; Aber, Belsky, Slade, & Crnic, 1999; Fenning, Baker, Baker, & Crnic, 2007).

Toddler Behavior Assessment Questionnaire (TBAQ; Goldsmith, 1988; Goldsmith, Elliot, & Jaco, 1986). To assess child temperament mothers completed the TBAQ at child age 3 years. This 65-item questionnaire asks parents to report on the frequency of behaviors over the past month. Each item is rated on a 6-point scale ranging from 1 (never) to 6 (always); there is also a not applicable option for use when the respondent has not seen the child in a particular situation in the prior month. The TBAQ measures various components related to temperament, including: activity level, pleasure, social fearfulness, anger proneness, and interest/persistence. The present study examined the social fearfulness subscale. The dimension of social fearfulness refers to distress, withdrawal or signs of shyness in a novel social situation (e.g. "When your child was being approached by an unfamiliar adult while shopping or out walking, how often did your child show distress or cry?"). The internal consistencies reported for TBAQ scales range from .66–.89 (Goldsmith, 1996; Rothbart, Ahadi, Hershey, & Fisher, 2001).

Data Analytic Plan

We employed latent growth curve modeling (LGCM; i.e., growth models estimated within the Structural Equation Model framework) utilizing Mplus 7.0 (Muthén & Muthén,1998-2015), to examine the developmental trajectory of anxiety symptoms (ages 3-13) and to examine the individual and interactive effects of our four key variables measured in early childhood (child delay status, temperament, and ethnicity, and also negative parenting) in predicting age 3 anxiety symptoms and change in anxiety. LGCM allows for examining individual differences in change over time, as well as examining what factors are associated with these changes (Cheong, MacKinnon, & Khoo, 2003; Raudenbush, 2001; Krull & Arruda, 2015). In LGCM, repeated

measures of the outcome construct (i.e., anxiety symptoms) serve as indicators of latent growth factors. Parent reports of anxiety symptoms on the CBCL at child ages 3, 4, 5, 6, 7, 8, 9, and 13 were used as indicators to estimate latent factors (intercept and slope). The intercept factor was centered at child age 3. The linear slope factor represented the rate of change in anxiety symptoms (ages 3-13 years). All models initially included only the intercept before adding a linear slope latent factor. Next, predictors were added into the model and continuous predictors were centered at the grand mean. Lastly, we ran two models in order to examine whether child delay status moderated the effects of negative parenting and child ethnicity. We ran two separate models, given that including multiple higher order terms introduces multicollinearity and instability in equations (Cohen, Cohen, West, & Aiken, 2003). We utilized the comparative fit index (CFI; values at or above .95 indicate adequate fit) and the root-mean-square error of approximation (RMSEA; values at or below 0.05 = excellent fit, 0.05–0.09 = good fit, and over 0.10 = inadequate fit) (Hu and Bentler, 1999). Prior research has demonstrated that the standard chi-squared test may not be a reliable indicator of model fit (Hu & Bentler, 1998); therefore, we utilized the RMSEA. Models were estimated using the full information maximum likelihood (FIML) estimator in Mplus, which allows the inclusion of participants with only partial data present.

Additionally, to aid in the interpretation and presentation of our findings, we include graphs made utilizing Microsoft Excel. We constructed growth curves depicting the model in which negative parenting (assessed at age 3) predicted change in anxiety problems within each delay status group. Coefficients for the intercept and linear slope generated in each LGCM were utilized to calculate expected values of anxiety at the mean and ±1SD of negative parenting.

Results

Demographics

Table 2-1a shows participant demographics at child age 3 by child delay status (TD, ID), as well as by child ethnicity (White, Latino). Table 2-1b shows correlations among model variables. The average child age for the entire sample was 35.0 months (SD= 2.9) at study intake, and there were more boys (60%) than girls. Mothers' mean age was 33.2 years. The socioeconomic status was generally high, with 48% of families having an annual household income (in 1998-2000) above $50,000. Mothers' years of schooling averaged 15.0. Demographics for the TD and ID status groups were similar, though TD group mothers had significantly more years of education and were slightly older. Demographics for the White and Latino ethnicity groups followed a similar pattern with White mothers being significantly older and with more years of education than Latina mothers.

LGCM Results

Change Over Time. The unconditional (without covariates) model indicated that anxiety symptoms were on average increasing from child ages 3-13 years. A positive linear slope was found to best capture yearly change in anxiety symptoms across ages 3-13 (Intercept: $B = 54.03$, $SE = 0.42$, $p < .001$; Slope: $B = 0.22$, $SE = 0.06$, $p < .05$). The unconditional model was determined to have good fit with the data, CFI = .95, RMSEA= 0.06.

Next, to examine the effect of child delay status, child temperament, child ethnicity, and negative parenting on change in anxiety symptoms over time, we fit a conditional model, and these factors were included as predictors. We also controlled for family income and child sex in all analyses. The final model was determined to have good fit with the data, CFI= .95, RMSEA= 0.05.

Individual Effects. Child delay status and child temperament predicted initial levels (age 3) of anxiety symptoms (Table 2-2). Children with ID presented with higher levels of anxiety than TD children. Also, higher levels of social fearfulness in toddlerhood were associated with higher levels of anxiety symptoms. The intercept was not predicted by child ethnicity, child sex, household income, or negative parenting. Change over time (linear slope), however, was significantly predicted by child ethnicity and negative parenting. On average, the yearly change rate in anxiety symptoms from ages 3-13 was lower for Latino children than the yearly change rate of White children. Therefore, Latino children's anxiety symptoms increased at a slower rate when compared to White children. Moreover, higher levels of negative parenting were associated with a steeper increase in anxiety symptoms for youth over time.

Interaction Effects. Next, we examined whether child delay status moderated the effect of negative parenting on anxiety symptoms. Delay status did not moderate the effect of negative parenting on initial levels of anxiety symptoms at child age 3 (intercept; Table 2-3a). However, delay status did moderate the effect of negative parenting on rate of change in anxiety symptoms over time (linear slope). For TD children, negative parenting was not significantly related to rate of change in anxiety symptoms from ages 3-13 (B = 0.00, SE= 0.07*, ns*). As depicted in Figure 2-1, children whose mothers varied in their levels of negative parenting, on average, all changed in their anxiety symptoms in a similar fashion across time. For children with ID, negative parenting was significantly related to rate of change in anxiety symptoms from ages 3-13 (B = 0.27, SE= 0.10, $p < .01$). As seen in Figure 2-2, high levels of negative parenting appeared to predict the greatest increase in anxiety from ages 3-13, whereas lower levels of negative parenting predicted the least steep increase in anxiety symptoms.

Lastly, we examined the interaction between child delay status and child ethnicity in predicting the intercept and slope. The interaction between child delay status and child ethnicity did not significantly predict initial levels of anxiety symptoms, nor rate of change in anxiety symptoms over time (Table 2-3b).

Discussion

The focus of this study was to examine the effect child delay status, child temperament, child ethnicity, and negative parenting have on longitudinally predicting anxiety symptom trajectory in youth with or without ID from early childhood to adolescence. We addressed important gaps in the literature by directly modeling change over time in anxiety symptoms, as well as examining predictors of anxiety trajectory, in Latino and White children with or without ID. Our first aim was to identify the developmental trajectory of anxiety symptoms from early childhood through adolescence. We utilized LGCM and found that, on average, anxiety symptoms increased from child ages 3-13 years. A positive slope best fit this trajectory, which is consistent with prior research that has examined change in anxiety symptomatology over time (e.g., Merikangas et al., 2010).

We then examined the main effects of three child characteristics (delay status, temperament, and ethnicity), and/or negative parenting on (a) initial levels of anxiety symptoms in early childhood and, (b) change in anxiety over time from early childhood to adolescence. Child delay status predicted initial levels of anxiety symptoms, such that children with ID presented with higher levels of anxiety symptoms than TD children. This is consistent with prior research that has demonstrated anxiety disorders to be more prevalent in children with ID (Deb, Thomas, & Bright, 2001; Green et al., 2014; Meltzer et al., 2000). Our study also corroborated prior research by finding that anxiety symptoms for children with TD or ID increased at a similar

rate from early childhood through adolescence (de Ruiter et al., 2007; Green et al., 2014). Additionally, social fearfulness predicted initial levels of anxiety symptoms, such that higher levels of social fearfulness were associated with more anxiety at age 3. Our findings are in line with prior research, which has found temperament traits such as fear, shyness, and emotional reactivity/inhibition to be associated with anxiety symptomatology (Colder et al., 2002; Kagan et al., 1999; Prior et al., 2000). Traits such as social fearfulness are thought to decrease an individual's ability to cope with emotional arousal, which in turn results in increased levels of anxiety.

Next, we examined the yearly change in anxiety symptoms from age 3 to 13 years, and found main effects for child ethnicity and negative parenting. Anxiety symptoms increased at a slower rate for Latino children as compared to White children. This finding was unexpected given that prior research with typically developing youth has shown that Latino youth present with more symptoms of anxiety when compared to White youth (Ginsburg & Silverman, 1996; Pina & Silverman, 2004; Varela et al., 2004). The discrepancy between our findings and others may be related to differences in study designs. Whereas prior studies have examined levels of anxiety symptoms at a single time point, the present study examined the trajectory of anxiety symptoms longitudinally (examining rate of change from ages 3-13 years). Additionally, previous studies examining the differences in anxiety symptoms between White and Latino youth have focused on clinically anxious populations, whereas, the present study targeted children with a wide range of anxiety symptomology. Nonetheless, this finding could be due to the discrepant levels of mental health literacy among White and Latino parents (Alegria et al., 2002), leading Latino mothers to be less likely to identify symptoms of anxiety. This could particularly be the case early on in development, when a child's symptoms of anxiety are more

likely to be misconstrued as externalizing behaviors (e.g., having a tantrum when feeling anxious). Further, this could also be due to cultural beliefs, such as familism, which has previously been shown to be a protective factor against internalizing symptoms in Latino youth (Smokowski & Bacallao, 2007). This strong family cohesion may provide Latino youth with a sense of security and warmth, in turn reducing symptoms of anxiety.

Further, we found a significant interaction effect between child delay status and negative parenting on change in anxiety symptoms age 3 to 13 years. For children with typical development, negative parenting did not significantly predict the trajectory of anxiety symptoms. However, for children with ID, higher negative parenting in early childhood predicted faster increases in anxiety symptoms from early childhood through adolescence. This is consistent with prior literature, showing that environmental factors, such as parenting, have a greater impact on the well-being of children who are developmentally at high-risk (Denham et al., 2000; Fenning et al., 2007). Moreover, the effect of negative parenting on anxiety symptoms appear to be more pronounced as children enter middle childhood and continues into early adolescence. This could be due to the fact that anxiety is 4 to 10 times more likely to co-occur with externalizing behavior problems in children with ID (Green et al., 2014). Therefore, it may be more difficult to identify anxiety symptoms in early childhood, since children with ID may act out or be noncompliant when they become anxious due to their difficulties with emotion regulation and verbal expression.

Limitations and Future Directions

The present findings should be interpreted in the context of several limitations. First, our small sample size of Latino mother-child dyads may have limited our ability to detect significant effects. Hopefully future research by other investigators will continue to examine anxiety

symptomatology in Latino youth with ID. Second, we did not have information regarding other possible predictors, including immigration status, cultural values, or acculturation levels of our Latino sample. Future research should examine whether acculturation levels and cultural values, such as *familismo* moderate and/or mediate these relationships. Additionally, the present study was limited by the fact that we could not differentiate types of anxiety disorders. Future research should examine trajectories of various types of anxiety symptoms in culturally diverse children with ID.

Conclusions and Implications

We know that anxiety has a broad impact on an individual's socioemotional functioning (e.g. Alfano et al., 2007). The examination of early risk factors for heightened anxiety symptoms throughout development helps to inform early interventions, which in turn could help in preventing the negative sequelae that result from anxious symptomatology. The present study's findings have implications for interventions with ethnically diverse children with or without intellectual disabilities. First, identifying children who are most at-risk for developing anxiety early on (e.g., children whose temperament or developmental risk predisposes them) could aid in tailoring early intervention services, in order to prevent the development of anxiety disorders in later childhood/adolescence. Additionally, parents, especially those of children at risk, would benefit from receiving psychoeducation regarding how anxiety symptoms present in early childhood. This would allow caregivers to more easily identify and target these mental health concerns early on in their child's development. Lastly, interventions for families of children with ID might consider targeting negative parenting practices in early childhood as these have long term effects on child psychopathology.

Table 2-1a. Collaborative Family Study demographic characteristics by status (TD, ID) and ethnicity (White, Latino).

	Child Delay Status			Child Ethnicity		
	TD (N= 113)	ID (N= 64)	*t* or x^2 status	White (non-Hispanic) (N= 126)	Latino (N= 51)	*t* or x^2 ethnicity
Child IQ (SD)	103.5 (11.2)	60.6 (16.3)	*t*= 18.65***			
Child Sex (% Male)	61.9	57.8	x^2 = .29	62.7	54.9	x^2= 0.92
Mother's age	33.9 (5.6)	31.9 (5.7)	*t*= 2.32*	33.8 (5.7)	31.7 (5.6)	*t*= 2.18*
Mother's education	15.5 (2.6)	14.0 (2.1)	*t*= 4.36***	15.4 (2.5)	13.9 (2.3)	*t*=3.43**
Income (% > $50,000)	53.6	39.1	x^2 = 3.43$^+$	53.6	35.3	x^2 = 4.86*

Note. $^+p<.10$ *$p<.05$, **$p<.01$, ***$p<.001$

Table 2-1b. Correlations among key variables.

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Sex	1												
2. Household Income	.02	1											
3. Delay Status	-.04	-.17*	1										
4. Ethnicity	-.07	-.22**	.17*	1									
5. Temperament	-.06	-.13$^+$	.05	.07	1								
6. Negative Parenting	.14$^+$	-.30***	.47***	.21**	.08	1							
7. Age 3 Anxiety	.04	-.14$^+$	.18**	.15*	.28***	.10	1						
8. Age 4 Anxiety	-.01	-.23**	.18**	.07	.12	.07	.52***	1					
9. Age 5 Anxiety	-.02	-.15*	.13$^+$	.14$^+$	.03	.09	.53***	.53***	1				
10. Age 6 Anxiety	.00	-.19*	.11	.03	.07	.00	.56***	.47***	.59***	1			
11. Age 7 Anxiety	.05	-.25**	.05	-.00	.14$^+$	.08	.44***	.37***	.53***	.67***	1		
12. Age 8 Anxiety	-.07	-.13	.11	.-.02	.16$^+$	-.01	.57***	.44***	.53***	.68***	.67***	1	
13. Age 9 Anxiety	-.02	-.08	.10	-.08	.06	.09	.44***	.36***	.49***	.59***	.68***	.65***	1
14. Age 13 Anxiety	.03	-.31**	.28**	-.16	.04	.30**	.44***	.46***	.54***	.57***	.65***	.60***	.65***

Note. $^+p<.10$ *$p<.05$, **$p<.01$, ***$p<.001$

Table 2-2. Individual effects latent growth curve model.

	Intercept at age 3		*Linear Slope ages 3-13*	
	B	**SE**	**B**	**SE**
Effect of:				
Child Sex	0.66	0.85	-0.23^{+}	0.13
Household Income	-0.42^{+}	0.23	-0.01	0.03
Delay Status	1.85*	0.97	0.01	0.16
Ethnicity	1.24	0.93	-0.53***	0.14
Temperament	1.01*	0.45	-0.09	0.07
Negative Parenting	-0.47	0.37	0.13*	0.06

Note. $^{+}p<.10$ *$p<.05$, **$p<.01$, ***$p<.001$

Table 2-3a. Delay status and negative parenting interaction latent growth curve model.

	Intercept at age 3		*Linear Slope ages 3-13*	
	B	**SE**	**B**	**SE**
Effect of:				
Child Sex	0.52	0.85	-0.19	0.13
Household Income	-0.39^{+}	0.23	-0.02	0.03
Delay Status	2.21*	0.99	-0.09	0.16
Ethnicity	1.00	0.94	-0.48**	0.14
Temperament	1.13*	0.45	-0.11	0.07
Negative Parenting	0.04	0.50	0.03	0.07
Status x Parenting	-1.16	0.73	0.24*	0.12

Note. $^{+}p<.10$ *$p<.05$, **$p<.01$, ***$p<.001$

Table 2-3b. Delay status and ethnicity interaction latent growth curve model.

	Intercept at age 3		*Linear Slope ages 3-13*	
	B	**SE**	**B**	**SE**
Effect of:				
Child Sex	0.69	0.86	-0.24^{+}	0.13
Household Income	-0.41^{+}	0.23	-0.02	0.03
Delay Status	1.54	1.18	0.21	0.19
Ethnicity	0.91	1.23	-0.32^{+}	0.19
Temperament	1.00*	0.45	-0.08	0.07
Negative Parenting	-0.45	0.38	0.11*	0.06
Status x Ethnicity	0.81	1.90	-0.50^{+}	0.29

Note. $^{+}p<.10$ *$p<.05$, **$p<.01$, ***$p<.001$

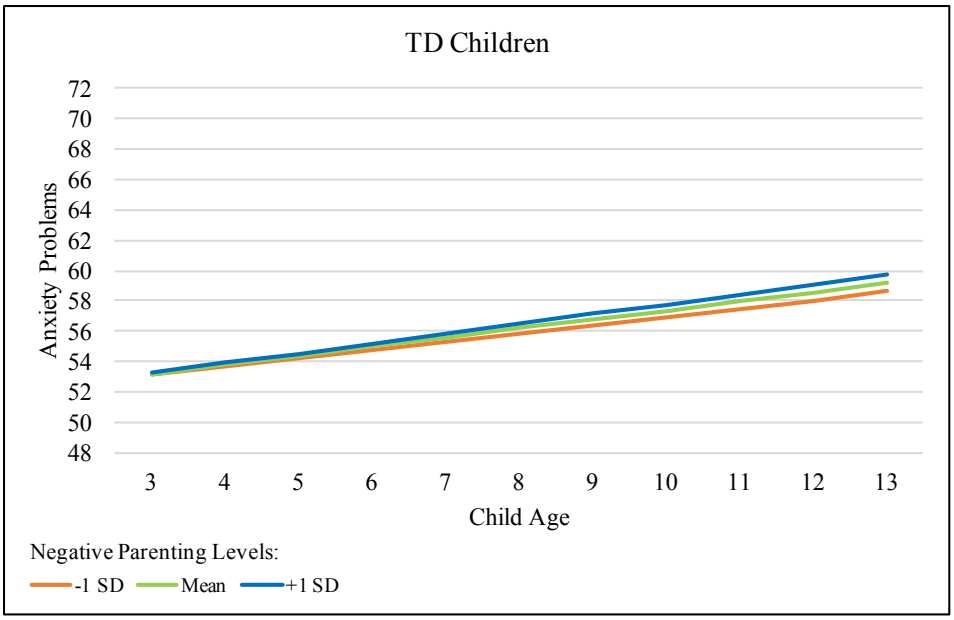

Figure 2-1. Negative parenting in predicting change in anxiety problems among TD children.

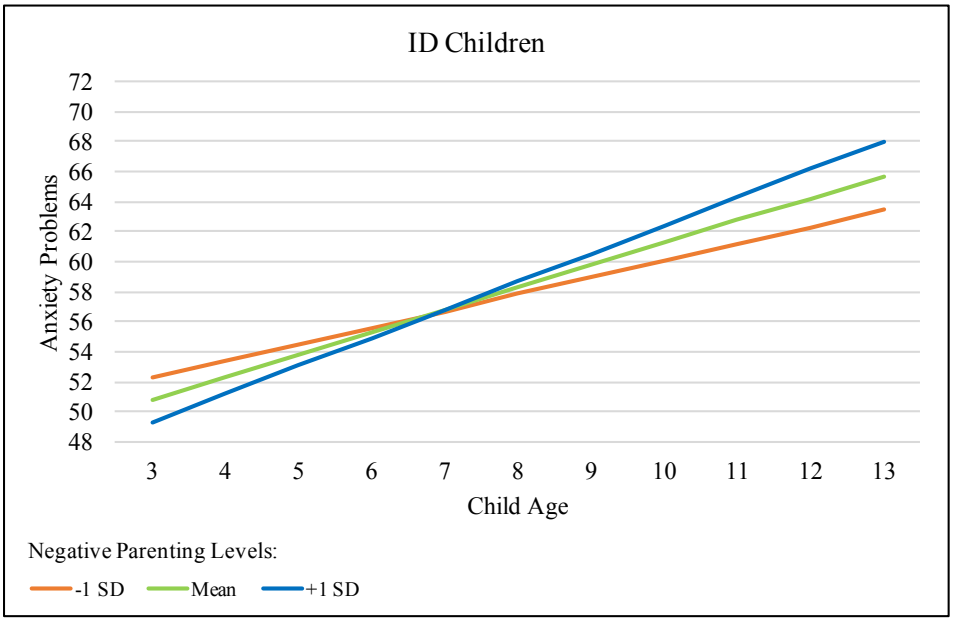

Figure 2-2. Negative parenting in predicting change in anxiety problems among children with ID.

Chapter 4

Examining the impact of familial and sociocultural factors on concurrent anxiety symptoms in children with ASD (Study 3)

Abstract

Children with Autism Spectrum Disorder (ASD) are at heightened risk of anxiety symptoms. Therefore, there is a need to examine the effect sociocultural factors have on anxiety symptomatology in this population. In the present study, we examined the relationship between socioeconomic status (SES) and anxiety symptoms in children with ASD, as well as to examine whether anxiety symptomatology differed by child ethnicity (Latino vs. White). We also sought to examine a moderation model linking maternal acculturation, maternal familism, and child anxiety symptoms in Latino families. Participants were 116 mothers and their children.

We found that SES was inversely associated with child anxiety symptoms. Further, Latino and White children with ASD did not differ in their anxiety symptom levels. Additionally, maternal familism was found to moderate the relationship between maternal enculturation and child anxiety. Our findings highlight the importance of identifying and targeting interventions for high-risk children. Additionally, enculturation and familism may be salient targets of intervention within the context of child anxiety treatment for Latino families.

Introduction

Individuals with Autism Spectrum Disorder (ASD), in addition to presenting with core deficits in social communication and restricted and repetitive behaviors, also present with heightened risk of developing comorbid internalizing disorders, such as anxiety (van Steensel, Bogels, & Perrin, 2011; Wood & Gadow, 2010). Anxiety disorders are prevalent in about 40% of youth under the age of 18 years with an Autism Spectrum Disorder (ASD) (Jennett, Vasa, & Hagopian, 2013), in contrast to the prevalence rate of approximately 10% in the general population of children with neurotypical development (Costello, Egger, Copeland, Erkanli, & Angold, 2011). Though in children with ASD it is difficult to differentiate symptoms of anxiety from core symptoms of ASD, due to the overlap between anxiety and the diagnosis of ASD, many children with ASD experience a significant number of anxiety symptoms independent of their ASD symptomatology (Jennett et al., 2013). While research regarding the etiology of anxiety in ASD is continuing to develop, there is a need to examine how familial and sociocultural factors may also be implicated in the development of anxiety.

Socioeconomic Status. Lower socioeconomic status has been widely implicated as a risk factor of psychopathology, including anxiety disorders in typically developing (TD) children (Bor et al., 1997; Lemstra et al., 2008; Miech et al., 1999; Ozer et al., 2008; Spence et al., 2002). Researchers have also found that lower SES is related to higher rates of comorbid psychopathology in children and adolescents with ASD (Rosa et al., 2016; Simonoff et al., 2008). Simonoff and colleagues (2008) found a positive relationship between family deprivation and comorbid psychopathology for male children with ASD. However, there has been some research that has failed to find an association between SES and increased psychopathology in children with ASD. Mayes and colleagues (2011) did not find parental occupation to be

associated with child anxiety. Discrepancies in the literature thus far are likely due to differences in operationalization of socioeconomic status. Nonetheless, given that this is an emerging area of research, there is a need to continue to investigate the relationship between SES and anxiety symptoms in children with ASD. This will help inform whether SES is an exacerbating risk factor for these children.

Ethnicity. In studies examining family culture in children with neurotypical development, Latino youth have been shown to present with higher levels of anxiety symptomatology when compared to their White (non-Hispanic) peers (Ginsburg & Silverman, 1996; Pina and Silverman, 2004; Varela et al., 2004). Latino youth are taught to place their emotional needs secondary to those of their family and the collective group as a whole. This emphasis on emotional containment likely prevents a child from understanding and appropriately managing his/her internal state, ultimately leading to internalizing symptoms (Varela et al., 2004; Varela et al., 2007). Given that children with ASD are broadly more likely to present with anxiety symptoms, it is imperative to examine whether Latino children with ASD may be significantly more at risk in order to help target interventions.

Acculturation. It is important to take into account specific cultural factors that may affect the development of anxiety symptomatology in Latino children. Acculturation is the bidimensional process through which cultural change occurs when individuals from two different cultural groups come into contact (Berry, 1980; Berry, 1998). It involves both the incorporation of new cultural beliefs and practices (i.e., acculturation), as well the maintenance of traditional norms and values (i.e., enculturation; Berry, 2006). Acculturation has been shown to have a negative impact on health behaviors and overall well-being in Latino youth with typical development (Gonzales, Knight, Birman, & Sirolli, 2004). However, the evidence regarding the

impact of acculturation on mental health, and specifically on internalizing disorders, has been mixed. Some researchers have found a positive relationship between acculturation and mental health, while others have demonstrated a negative relationship (see Varela & Hensley, 2009 for review). Specifically, with respect to internalizing disorders, studies have reported a relationship between greater acculturation and heightened internalizing symptoms in Latino youth (Dawson & Williams, 2008; Gonzales et al. 2004; Lorenzo-Blanco et al., 2012). However, there has also been research to support that increased time spent in the United States is associated with fewer internalizing symptoms in adolescents (Smokowski et al., 2014). Additionally, higher maternal acculturation has also been shown to predict reduced symptoms of depression in children (Dumka, Roosa, & Jackson, 1997). These inconsistent findings may be in part due to the bidimensional nature of acculturation, as well as differences in individuals' acculturation levels across studies. Further research examining the relationship between acculturation and anxiety symptoms in children is necessary, in order to elucidate whether underlying mechanisms (i.e., moderators) account for the mixed findings in the literature thus far.

Familism. Moreover, familism—defined as value, pride, and closeness in one's family—is seen as one of the cornerstones of Latino culture (Marin & Marin, 1991; Smokowski et al., 2009). This strong sense of family orientation, cohesion, and obligation has been shown to be a protective factor in multiple domains of functioning (Smokowski et al., 2014; Stein et al., 2015; Vega, 1995). In a meta-analysis by Valdivieso-Mora and colleagues (2016), familism was found to have a significant inverse relationship to internalizing symptoms. Additionally, researchers have found that familism moderates the effects of cultural stressors on internalizing symptoms in adolescents (Umana-Taylor et al., 2011). Research examining the role cultural factors play in the development of internalizing disorders, such as anxiety, are yet to be examined within the ASD

literature. We aimed to expand on the present literature by investigating whether familism functions as a moderator between mother acculturation and child anxiety in Latino families of children with ASD.

Culture and Delay Status. Research investigating ethnicity and culture in children with developmental delays (DD) has established that cultural groups vary in their beliefs regarding child development and disability (Skinner & Weisner, 2007). Additionally, Latino parents of children with intellectual disability (ID) have emphasized the importance of familism (Magaña & Smith, 2006). This cultural belief has been shown to be associated with decreased levels of stress associated with caring for a child with ID in Latina mothers (Bailer et al., 1999; Magaña, 1999). Latina mothers also have reported that their child with ID has had a greater positive impact on the family when compared to White mothers (Blacher & Baker, 2007; Blacher, Begum, Marcoulides, & Baker, 2013). However, researchers have yet to examine whether these maternal cultural beliefs affect the child's well-being/psychopathology. There is still much to be learned specifically with regard to the interplay between culture and mental health in children with ASD. To the best of our knowledge, this is the first study to examine the role that sociocultural factors play on anxiety symptoms in children with ASD.

Research Questions and Hypotheses

The first aim of this study was to examine the relationship between socioeconomic status and anxiety symptoms in children with autism spectrum disorder (ASD), as well as to examine the extent to which anxiety symptomatology varies by child ethnicity (Latino vs. White).

1) To what extent does socioeconomic status (SES) relate to anxiety symptoms in a sample of children with ASD?

2) To what extent do anxiety symptom levels differ between Latino and White children with ASD?

A secondary aim was to examine a moderation model linking maternal acculturation, maternal familism, and child anxiety symptoms in Latino families.

3a) To what extent does maternal acculturation/enculturation relate to anxiety symptoms in Latino children with ASD?

3b) To what extent is the effect of maternal acculturation/enculturation on child anxiety symptoms moderated by maternal familism?

Based on prior research, we expected low SES to be significantly related with increased levels of anxiety symptomatology (e.g. Rosa et al., 2016; Simonoff et al., 2008). We also expected that Latino children with ASD would present with higher levels of anxiety symptoms than White children (Ginsburg & Silverman, 1996; Pina and Silverman, 2004; Varela et al., 2004). Additionally, we expected maternal familism to moderate the relationships between maternal acculturation and child anxiety symptoms.

Method

Participants

Participants for the present study were dyads of mothers and their children suspected of ASD who were seen at an autism-specific screening clinic, which is part of the SEARCH Family Autism Resource Center located at the University of California, Riverside. The sample was comprised of participants who identified as either ethnically White (non-Hispanic; n=42) or Latino (n=74). Children who were biracial, half Latino, were included in the Latino group. Additionally, children were eligible for the present study if they scored in the autism or autism spectrum range on the ADOS-2 and were between 1.5-10 years old at the time of data collection.

The ADOS-2 was completed in the child's primary language (English/Spanish), and 19.5% of Latina mothers completed the questionnaires in Spanish, with trained, native Spanish-speaking staff.

Procedure

Assessments were conducted by doctoral students and postdoctoral fellows from school psychology, special education, or clinical psychology. Assessors were reliably trained in the use of the gold standard assessment instruments in ASD (see below) and received extensive training on the ADOS-2 in particular. They were also supervised by the center director and a licensed clinical psychologist. Additionally, during the assessment, caregivers completed an intake form, measures of child anxiety problems, and measures of acculturation, and familism.

Measures

Intake Form. The Intake Form was adapted from the Child History/Information Questionnaire utilized by the Early Childhood Partial Hospitalization Program (ECPHP) at UCLA (Semel Institute, 2010, http://www2.semel.ucla.edu/sites/default/files/pdf/Child%20Hx-Info%202015%20Final.pdf). It is utilized by the screening clinic to gather the following information: personal/demographic information, developmental history of the child, current concerns regarding the child, services the child currently receives, resources the caregiver is interested in learning about, child's current living situation, cultural/linguistic background information, gross household income, and child's sibling information. In the present study, we utilized mother's education in order to measure socioeconomic status. Caregivers were asked to report their "Highest level of education" with the following brackets provided: None/Grade School, High School Diploma/GED, Some College, AA/Vocational Degree, Bachelor's Degree (B.A./B.S.), Master's Degree (M.A./M.S.), Doctoral Degree (Ph.D., M.D., J.D.). In our analyses,

we dichotomized mother's education into "High School Diploma or less" or "Higher than High School Education".

Autism Diagnostic Observation Schedule, Second Edition (ADOS-2; Lord et al., 2012). The ADOS-2 was utilized in order to assess children for ASD. The ADOS-2 is a semi-structured, standardized clinical observation tool composed of two domains: Social Affect and Restricted, Repetitive Behavior (Lord et al., 2012). The ADOS-2 module used (1, 2, or 3) depended on the child's level of development and language. Each module consists of standard activities that allow the examiner to observe communication skills, social interaction skills, and stereotyped behaviors or restricted interests. Observed behaviors are scored and a standardized diagnostic algorithm is applied. Children are classified as either autism, autism spectrum, or not on the autism spectrum. Children that fell in either the autism or autism spectrum range were considered eligible for the present study.

Bidimensional Acculturation Scale for Hispanics (BAS; Marın & Gamba, 1996). Latino parents' orientations toward mainstream and Latino culture were measured with the BAS, which assesses individuals' language-related acculturation in relation to mainstream culture and enculturation in relation to Latino culture. This measure consists of 24-items assessing language use, linguistic proficiency, and electronic media use. Items include questions such as, "How well do you read in English?" and "How well do you understand music in Spanish?" We utilized the Linguistic Proficiency English Acculturation and Spanish Enculturation subscales. This measure has been shown to be valid, as well as reliable, with $\alpha = .91$ and $\alpha = .96$ for acculturation and enculturation respectively (Marın & Gamba, 1996).

Attitudinal Familism Scale (AFS; Steidel & Contreras, 2003). The AFS was utilized to assess familism. This measure consists of 18 items assessing familial support (6 items), familial

interconnectedness (5 items), familial honor (4 items), and subjugation of self to family (3 items). Items include statements such as, “Parents and grandparents should be treated with great respect regardless of their differences in views.” Each item is rated on a 5-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree). The present study utilized the familial support and familial interconnectedness subscale scores. Given the high correlation among these subscales, we created a composite by taking the mean of the two subscale scores. This measure has been shown to be valid and reliable (α= .83) (Steidel & Contreras, 2003).

Child Behavior Checklist for Ages 1½–5 years and Ages 6–18 years (CBCL; Achenbach, 2000; Achenbach & Rescorla, 2001). The present study utilized parents’ reports on the CBCL in order to assess child anxiety symptoms. Two parent versions of the CBCL were used depending on the child’s age. Each item is rated on a 3-point scale: 0 (not true), 1 (somewhat or sometimes true), or 2 (very true or often true). The present study utilized t-scores for the anxiety problems subscale to assess anxiety. The CBCL subscales have been shown to have good validity and internal consistency, with alpha coefficients ranging from .78 to .84.

Data Analytic Plan

We utilized SPSS version 24 to conduct a regression analysis, controlling for child sex and ethnicity, in order to determine whether socioeconomic status was associated with concurrent anxiety symptoms in children with ASD. Next, we ran analysis of covariance (ANCOVA) in order to elucidate the ethnic differences in anxiety symptoms between Latino and White children with ASD. Lastly, we utilized Mplus version 8 (Muthen & Muthen, 1998-2017) to examine the extent to which acculturation, familism, and child anxiety were related in the subsample of Latino children with ASD. We examined the extent to which maternal acculturation and enculturation related to concurrent child anxiety symptoms. We also sought to determine

whether the relationships between mother acculturation/enculturation and child anxiety were moderated by level of maternal familism. We utilized full information likelihood (FIML) to estimate missing data. FIML has been shown to be an estimator that demonstrates superior performance to list-wise and pairwise deletion (Enders 2001).

Results

Demographics

Table 3-1a shows participant demographics by child ethnicity (White or Latino) for the sample, Table 3-1b shows correlations among model variables. The present sample of children was 79.3% male. Mothers' mean age at baseline was 33.3 years. Families' gross annual income, on average, was between $35,001-50,000. White mothers were significantly more likely to have higher than a high school education level and higher income compared to Latina mothers. Additionally, White mothers were on average slightly older than Latina mothers.

Effects of Socioeconomic Status and Ethnicity

First, we examined the extent to which socioeconomic status (SES) related to anxiety symptoms (Table 3-2). We ran a linear regression and found that SES was significantly associated with child anxiety symptoms (B = -6.48, $p < .05$), while accounting for child sex and child ethnicity. Children whose mothers had higher than a high school education level demonstrated lower levels of anxiety problems relative to those whose mothers had a high school level education or lower.

Next, in order to elucidate whether there were differences in anxiety symptoms between Latino and White children, we ran an analysis of covariance (ANCOVA) with child sex as a covariate (Table 3-3). The results indicated that there was not a significant effect of ethnicity F

(1, 116) = 0.27, $p = 0.59$. Thus, White and Latino children did not significantly differ with regard to their anxiety symptomatology levels.

Acculturation, Familism, and Anxiety Symptoms

Moreover, we examined the extent to which maternal acculturation and enculturation levels were associated with child anxiety symptoms in the subsample of Latino families (n = 74). We ran a linear regression using robust maximum likelihood, entering maternal acculturation and enculturation as predictors of child anxiety symptoms, while accounting for child sex and socioeconomic status. Maternal acculturation, but not maternal enculturation, was significantly associated with concurrent child anxiety symptoms (Table 3-4). Maternal acculturation was inversely associated with child anxiety, such that as maternal acculturation increased child anxiety decreased. The overall model explained 15% of the variance, $R^2 = 0.15$, $p = .07$. Notably, we also ran this model controlling for socioeconomic status ($B = -6.18$, $p < .05$), and found that the overall variance explained increased ($R^2 = 0.20$, $p < .05$). Additionally, the effect of maternal acculturation remained significant ($B = -3.80$, $p < .05$), with SES in the model.

Familism as a Moderator

Last, we examined whether maternal familism functioned as a moderator between maternal enculturation/acculturation and child anxiety symptoms. We ran two separate models, one for acculturation and one for enculturation. First, we ran a model testing the moderation effect of familism on enculturation predicting child anxiety, while covarying for child sex and maternal acculturation (Table 3-5a). The results indicated that the cross-product term between maternal enculturation and familism on child anxiety symptoms was significant ($B = 10.82$, $t(68) = 3.38$, $p < .01$). Thus, the association between maternal enculturation and child anxiety was dependent on the level of maternal familism. The overall model explained 40% of the variance,

$R^2 = 0.40$, $p < .01$. Furthermore, follow-up analyses of the moderation indicated that enculturation was significantly inversely associated with child anxiety problems at low levels of familism ($B = -5.48$, $t(68) = -3.69$, $p < .001$). This suggests that at low levels of maternal familism (i.e., at the 20th percentile), as maternal enculturation levels increased, child anxiety symptoms decreased (Figure 3-1). The simple slopes at medium (i.e., 40th percentile; $B = -1.54$, $t(68) = -0.72$ $p = .47$) or high (i.e., 80th percentile; $B = 3.37$, $t(68) = 0.98$ $p = .32$) levels of familism were not significant.

Next, we ran a model testing the moderation effect of familism on acculturation predicting child anxiety, while covarying for child sex and maternal enculturation (Table 3-5b). The results indicated that the cross-product term between maternal acculturation and familism on child anxiety symptoms was not significant ($B = -3.60$, $t(68) = -0.96$, $p = .33$). Therefore, familism did not moderate the relationship between maternal acculturation and child anxiety symptoms.

Discussion

We examined the relationship between socioeconomic status (SES) and anxiety symptoms in a sample of children with autism spectrum disorder (ASD). We also sought to determine whether anxiety symptomatology levels differed significantly between White and Latino children. Lastly, in a subsample of Latino families we examined a moderation model linking maternal acculturation/enculturation, maternal familism, and child anxiety symptoms. We addressed important gaps in the literature by examining how sociocultural and familial processes affect child psychopathology in children with neurodevelopmental disorders.

We found that socioeconomic status was inversely related to child anxiety symptoms in a sample of children with ASD. This is in line with the abundance of literature finding an inverse

relationship between SES and internalizing psychopathology for children with neurotypical development. Additionally, this also helps to expand upon the growing research base that has found a relationship between SES and comorbid psychopathology in children with ASD (e.g., Rosa et al., 2016; Simonoff et al., 2008). It's important to examine the extent to which sociocultural processes, such as SES, affect children with neurodevelopmental disorders given that they are at-risk broadly of presenting with comorbid psychopathology such as anxiety. This helps to identify children who may be most at risk given their predisposition due to their neurodevelopmental disorder, as well as due to their economic disadvantage. In the present study, we specifically operationalized socioeconomic status as maternal education level. Therefore, it's important for future research to examine the mechanisms by which maternal education level is impacting child anxiety symptoms.

Next, we found that anxiety symptom levels did not significantly differ between Latino and White children. This was surprising given that prior literature examining these differences in typically developing (TD) children has found that Latino children present with higher levels of anxiety symptoms compared to their White peers (Varela et al., 2004). Nonetheless, our findings could be due to the fact that children with ASD are significantly more likely to present with comorbid anxiety symptoms than TD children. Therefore, it appears that this heightened risk of anxiety disorders in children with ASD affects White and Latino children in a similar manner.

Furthermore, we examined the relationship between maternal enculturation/acculturation, familism, and child anxiety symptoms in a subsample of Latino families. We first examined whether acculturation and/or enculturation were associated with concurrent anxiety symptoms. Maternal acculturation was inversely related to child anxiety, such that as maternal acculturation increased child anxiety decreased. Therefore, it appears that in this group of children with ASD,

having mothers that are oriented toward the mainstream culture is a protective factor against anxiety. Our findings corroborate Dumka and colleagues (1997), which found that maternal acculturation was predictive of reduced child depressive symptoms. It may be possible that having mothers that are engaging in the mainstream culture with more ease results in fewer stressors and thus fewer worries for children. More highly acculturated mothers may also have the ability to seek out services and resources more easily, without having language be a barrier, which is likely benefitting their child's well-being.

Furthermore, we found that the relationship between maternal enculturation and child anxiety was moderated by maternal familism. Specifically, maternal enculturation was inversely associated with child anxiety symptoms at low levels of maternal familism, but not at average or high levels of familism. Therefore, it appears that the absence of familism is particularly a risk factor for children whose families are not aligned with Latino culture. Familism has been described as being a protective factor for youth by solidifying strong family bonds, which in turn help youth feel that their family is a source of support (Germán, Gonzales, & Dumka, 2009). It may be possible that mothers of children with low familism and low enculturation expect their child with ASD to be more independent in their functioning, which may be a particular source of stress for a child with a neurodevelopmental disorder. Additionally, prior research has demonstrated that mothers with high levels of familism engage in fewer harsh parenting practices than those with low levels of familism (White, Roosa, & Zeiders, 2012). Therefore, it is possible that the deleterious effects of low maternal familism may be influencing child socioemotional functioning through parenting practices. Moreover, as enculturation increased child anxiety symptoms decreased in families with low familism. Enculturation has been shown to be a buffer by providing individuals with a sense of belonging (Gonzalez, Knight, Birman, &

Sirolli, 2004). Therefore, it's possible that children whose mothers are more aligned with Latino culture are able to more easily connect with peers and other individuals from their culture, which may serve as a buffer in the context of low familism. Additionally, there may be other cultural beliefs serving as protective factors against anxiety symptoms for these children.

Limitations and Future Directions

The present findings should be interpreted in the context of several limitations. First, this study was cross-sectional and therefore the direction of effects needs to be further examined utilizing a longitudinal method. Additionally, further research is necessary in order to examine the effects of acculturation/enculturation and familism on child anxiety symptoms in a more detailed manner. For example, gathering data regarding how families are experiencing the process of acculturation (i.e., acculturative stress), as well as whether these values are influencing mothers' parenting of their children with ASD. It would also be important to examine other sociocultural values in order to elucidate the mechanisms through which enculturation is serving as a protective factor in the context of low familism. Lastly, we did not gather data regarding children's sociocultural values. Future research examining child/adolescent report on these values may also help to further elucidate the present study's findings.

Conclusions and Implications

We examined the effect sociocultural factors have on child anxiety symptoms for children with ASD. Our findings highlight the need for further research examining the mechanisms by which socioeconomic status impacts child anxiety in children with ASD. Such research would help to inform targets of intervention tailored to socioeconomically disadvantaged families. It may be the case that mother's with lower levels of education could benefit from receiving psychoeducation regarding child development broadly or interventions targeting parenting

practices. Further, we found that enculturation was inversely related to child anxiety symptoms in families with low levels of familism. Our findings suggest that fostering enculturation and familism within the context of child anxiety treatment for Latino families may be a salient target of intervention. These findings also highlight the nuances and complexities of sociocultural beliefs, and the fact that holding one value aligned with your culture does not mean you are aligned with every value. It also appears that these differing sociocultural beliefs/values (i.e., familism and acculturation/enculturation), differentially impact child mental health. This highlights the importance of cultural humility for providers working with children and families of diverse backgrounds, in order to tailor interventions appropriately.

Table 3-1a. Screening Clinic Study demographic characteristics by ethnicity (White, Latino).

	White (Non-Hispanic) (N=42)	Latino (N=74)	t or x^2 ethnicity
Child Sex (% Male)	71.4	83.7	x^2= 2.49
Child's age	4.6 (1.7)	4.9 (2.2)	t= -0.92
Mother's age	35.6 (7.9)	32.0 (5.9)	t= 2.83**
Household Income (% above $50,000)	56.0	27.4	x^2= 5.87*
Mother's education (% having higher than high school education)	83.3	60.8	x^2= 6.35*

Note. *p<.05, **p<.01, ***p<.001

Table 3-1b. Correlations among key variables.

	1	2	3	4	5	6	7
1. Child Sex	1						
2. Child Ethnicity	.14	1					
3. Socioeconomic Status	.02	-.23*	1				
4. Maternal Acculturation	.60***	-	.36**	1			
5. Maternal Enculturation	.16	-	-.01	-.44**	1		
6. Maternal Familism	.19	-	.02	-.06	.47**	1	
7. Child Anxiety	-.04	-.05	-.23*	-.31*	-.10	.08	1

Note. ^{+}p<.10 *p<.05, **p<.01, ***p<.001

Table 3-2. Linear regression predicting child anxiety symptoms from socioeconomic status.

Variable	***B***	**SE**	***t***	***p***
Constant	78.84	4.96	15.88	.000
Child Sex	-0.66	2.66	-0.25	.803
Child Ethnicity	-2.73	2.30	-1.18	.239
SES (Mother Education)	-6.48	2.37	-2.73	.007

Note. n= 116. Non-standardized regression coefficients are reported. Mother education was a dichotomous variable (0= No High School Degree Obtained, 1= Higher than High School education obtained)

Table 3-3. Child anxiety symptoms by child ethnicity covarying for child sex.

Variable	White (N= 42) Mean (SD)	Latino (N= 74) Mean (SD)	F	*p*
Child Anxiety Symptoms	66.38 (1.83)	65.17 (1.37)	0.27	.599

Table 3-4. Linear regression predicting child anxiety symptoms from maternal acculturation and enculturation in Latino families.

Variable	***B***	**SE**	***t***	***p***
Constant	97.25	8.44	11.52	.000
Child Sex	-3.58	2.58	-1.38	.165
Maternal Acculturation	-5.01	1.58	-3.16	.002
Maternal Enculturation	-2.84	1.73	-1.64	.101

Note. n= 74. Non-standardized regression coefficients are reported.

Table 3-5a. Regression results for familism as moderator of enculturation on child anxiety symptoms.

Variable	***B***	**SE**	***t***	***p***
Constant	68.34	5.29	12.91	.000
Child Sex	-3.85	2.63	-1.46	.143
Maternal Acculturation	-3.65	1.95	-1.87	.061
Maternal Enculturation	-0.48	2.39	-0.20	.841
Familism	1.93	3.56	0.54	.587
Enculturation x Familism	10.82	3.38	3.20	.001

Note. n= 74. Non-standardized regression coefficients are reported.

Table 3-5b. Regression results for familism as moderator of acculturation on child anxiety symptoms.

Variable	***B***	**SE**	***t***	***p***
Constant	72.81	4.60	15.80	.000
Child Sex	-4.49	2.59	-1.73	.083
Maternal Acculturation	-4.39	2.06	-2.13	.033
Maternal Enculturation	-3.11	2.08	-1.49	.135
Familism	2.89	4.99	0.57	.563
Acculturation x Familism	-3.60	3.74	-0.96	.337

Note. n= 74. Non-standardized regression coefficients are reported.

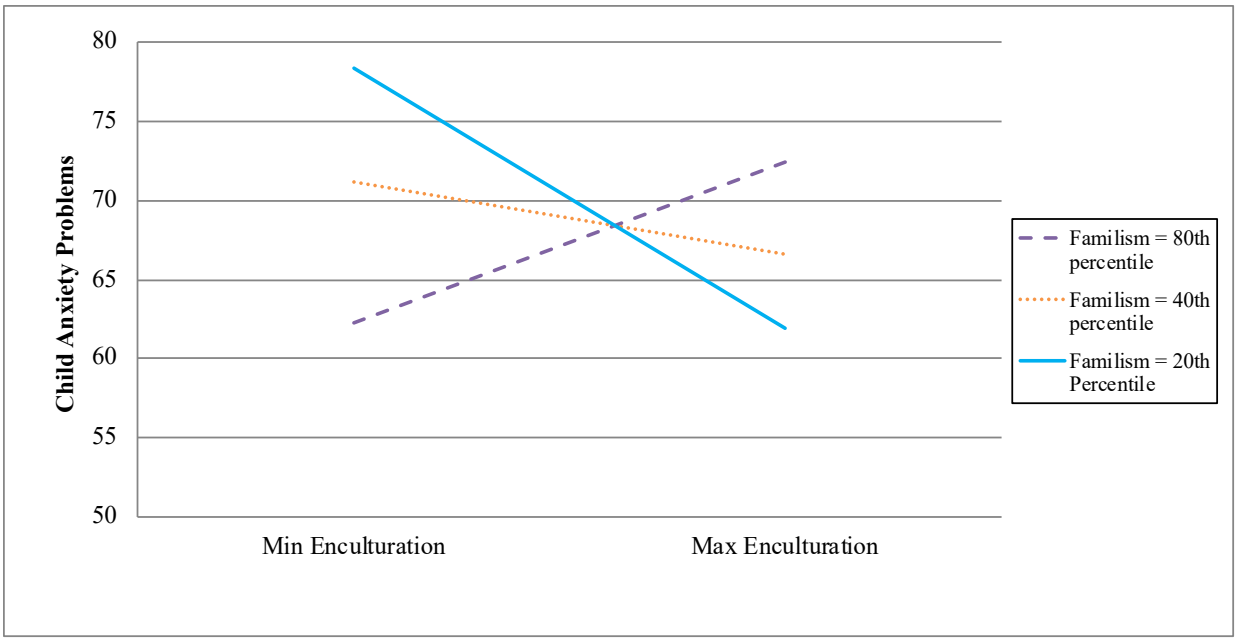

Figure 3-1. Interaction between maternal enculturation and maternal familism on child anxiety symptoms.

Chapter 5

General Discussion

In the present dissertation, we examined individual, familial, and sociocultural determinants of internalizing disorders in three at-risk samples. Prior research has demonstrated that internalizing disorders arise from a child's dispositional factors interacting with the environmental factors in which the child is developing (Zahn-Waxler et al., 2000). Therefore, we worked from Bronfenbrenner's Bioecological Systems Theory framework in order to specifically examine *Processes* (i.e., parenting and early life stress), *Person* factors (i.e., child delay status, temperament, and ethnicity), and *Context* factors (i.e., socioeconomic status, acculturation, and familism) involved in the development of internalizing psychopathology. We advanced the present dissertation aims in three separate studies of internalizing psychopathology utilizing samples of children with or without intellectual disability from the Collaborative Family Study, children from the Early Head Start Research and Evaluation project, and children with ASD from the SEARCH Autism Resource Center.

Internalizing disorders are the most common mental health concern among youth (Merikangas et al., 2010). They emerge during early childhood and, if left untreated, are associated with various negative sequelae (Michaud et al., 2006). The profound impact that internalizing disorders have on children's lives highlights the need to examine their development. Furthermore, the composition of the nation's youth is transforming. Latino Americans account for 17% of the U.S. population and this percent is rapidly growing (U.S. Census Bureau., 2010). Moreover, Latino youth present with higher risk of developing internalizing disorders (Varela et al., 2009). Given the strong presence of Latino youth, coupled with their increased risk for

psychopathology, it's imperative to examine the underlying mechanisms leading to internalizing disorders.

In Study 1, *The longitudinal examination of mechanisms between socioeconomic status and internalizing symptoms in children,* we sought to longitudinally examine the mechanisms through which socioeconomic status (SES) affects the development of internalizing symptoms in children from low SES households. We specifically examined whether negative parenting and early life stress mediated the relationship between SES and internalizing symptoms. We also sought to determine whether ethnicity (Latino vs. White) moderated these relationships. Negative parenting uniquely mediated the relationship between SES and internalizing behavior problems. Additionally, ethnicity moderated the indirect effect from SES to internalizing behavior problems through negative parenting, wherein SES was inversely associated with negative parenting, which in turn was positively associated with internalizing behavior problems for White children, but not for Latino children.

In Study 2, *Predictors of anxiety trajectories in children with or without Intellectual Disability (ID) from early childhood to adolescence*, we utilized latent growth curve modeling (LGCM) to examine the developmental trajectory of anxiety symptoms (ages 3-13) and to examine the individual and interactive effects of variables measured in early childhood in predicting age 3 anxiety symptoms and change in anxiety. We specifically examined the effect person (child delay status, child temperament, and child ethnicity) and process (negative parenting) factors have on longitudinally predicting anxiety symptom trajectory in youth with or without ID from early childhood to adolescence. On average, anxiety symptoms increased overall from early childhood to adolescence. Child delay status predicted initial levels of anxiety symptoms, such that children with ID presented with higher levels of anxiety symptoms

compared to TD children. Additionally, higher levels of social fearfulness were associated with higher levels of anxiety at age 3. We also found that anxiety symptoms increased at a slower rate for Latino children as compared to White children. There was also a significant interaction effect between child delay status and negative parenting on change in anxiety symptoms age 3 to 13 years. For children with typical development, negative parenting did not significantly predict the trajectory of anxiety symptoms. However, for children with ID, higher negative parenting in early childhood predicted faster increases in anxiety symptoms from early childhood through adolescence.

In Study 3, *The impact of familial and sociocultural factors on concurrent anxiety symptoms in children with autism spectrum disorder (ASD),* we examined the relationship between socioeconomic status and anxiety symptoms in children with ASD, and we examined the extent to which anxiety symptomatology varies by child ethnicity (Latino vs. White). Additionally, we examined a moderation model linking maternal acculturation, familism, and child anxiety symptoms in Latino families. Socioeconomic status was inversely associated with child anxiety symptoms. We also found that Latino and White children with ASD did not differ in their anxiety symptom levels. Lastly, maternal familism moderated the relationship between enculturation and child anxiety in Latino families of children with ASD.

The present dissertation provides implications for developmental psychopathology research. These studies highlight the importance of examining ethnic and cultural mechanisms affecting child well-being, particularly children who are predisposed to developing internalizing psychopathology. Study 1 and Study 2 found Latino/White ethnic differences in the predictions/development of internalizing symptoms. Additionally, Study 3 found that Latino familial/cultural processes are associated with child anxiety symptoms in children with ASD.

There is a need for continued research examining ethnic and cultural differences in the presentation and prediction of internalizing psychopathology. Furthermore, the present studies highlight the need to continue examining socioeconomic status and the mechanisms through which this context factor affects the development of internalizing disorders. Study 1 focused on examining the mediators through which SES longitudinally predicts internalizing symptoms, while Study 3 replicated the association between SES and anxiety symptoms in a sample of children with ASD.

The present dissertation also provides treatment implications for children with or without neurodevelopmental disorders. The first two studies highlight the importance of early intervention and parent training programs. Negative parenting was found to mediate the longitudinal relationship between socioeconomic status and internalizing psychopathology in Study 1; whereas the findings of Study 2 indicate that negative parenting in early childhood predicted change in anxiety symptoms into adolescence. Therefore, it is important to strengthen the parent-child relationship, particularly for children who are at higher risk for developing internalizing psychopathology due to economic disadvantage or neurodevelopmental disorders. Additionally, all three studies highlighted the importance of tailoring interventions to meet a family's unique needs (i.e., cultural, economic, etc.). The findings of Study 3 in particular, help to inform targets of intervention for culturally diverse children and families (i.e., fostering enculturation and familism in Latino families).

In conclusion, the present dissertation examined individual, familial, and sociocultural determinants of internalizing disorders in three at-risk samples. Findings corroborated that anxiety symptoms increase overtime in both children with neurodevelopmental disorders and children with neurotypical development. Children at higher risk (i.e., due to low SES or having

ID) appear to be particularly vulnerable to the development of internalizing psychopathology within the context of negative parenting. However, the effect of these person and process factors on internalizing symptoms may be moderated by ethnicity and culture. Further research is necessary examining how these process, person, and context factors interact with one another and in turn affect the development of internalizing psychopathology in children. This will be particularly helpful in informing and targeting interventions for children who are developmentally or economically at higher risk for developing anxiety and mood disorders.

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