The Relationship Between Parenting Stress and Child Abilities in Autism Spectrum Disorders and Minimal Verbal Abilities: Evidence from a Cross-national Study

By

Suma Suswaram
M.S., Bangalore University, 2015
B.S., Bangalore University, 2013

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Chair: Dr. Nancy C. Brady

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Dr. Matthew Gillispie

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Dr. Steven Warren

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Dr. Mabel Rice

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Dr. Brian Boyd

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The dissertation committee for Suma Suswaram certifies that this is the approved version of the following dissertation:

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Chair: Dr. Nancy C. Brady

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Abstract

Parents of children with Autism Spectrum Disorder (ASD) experience high levels of parenting stress because of an imbalance between childcare demands and availability of resources, which differs based on cultural environments. Parenting stress has significant correlations with developmental abilities in children. In children with minimal verbal abilities and ASD (MV-ASD), the relationships between parenting stress, cultural factors, and child abilities are critical but not well defined. In the current study, I explore the relationship between parenting stress, cultural value of the parents, and child abilities in children with MV-ASD from South India and the Midwestern U.S. Standardized parent-reported measures were used to collect data on parenting stress, cultural value of the parents, and child abilities. A total of 70 parents of children with MV-ASD participated, including 35 from South India and 35 from the Midwestern U.S. The results indicate a statistically significant correlation between child communication abilities, as well as between child abilities and parenting stress. Results did not show a significant moderating effect of cultural value of the parents on the relationship between communication abilities and parenting stress. We need a more sensitive measure of culture to assess its effects on communication skills in children and parenting stress of parents. Overall, this study highlights the influence of various child factors and parenting stress on communication and other developmental skills in children with MV-ASD.

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Chapter 1: Introduction

According to Center for Disease Control (CDC), 1 in every 44 children at the age of 8 years has a clinical diagnosis of Autism Spectrum Disorder (ASD) in the U.S. (Maenner et al., 2021). Worldwide, the prevalence is estimated to exceed 40 million (Wen et al., 2022). Parenting in itself is challenging but parenting a child with ASD introduces additional barriers that increases parenting stress (Suen et al., 2022). In fact, emerging from an imbalance between childrearing demands and availability of resources, parents of children with ASD experience the highest amount of parenting stress across parents of children with and without disabilities (Voliovitch et al., 2021). In the ASD literature, parenting stress is directly associated with self-efficacy and childrearing abilities of the parents, which in turn influences communication development in children (Russell & Ingersoll, 2021). For example, parent-child interactions are essential ingredients for communication development in children and are significantly altered in the presence of high levels of parenting stress (Clauser et al., 2021).

Identification and eventual diagnosis of ASD often emerge from an initial parental concern of delayed communication abilities in many children, which continues to dominate the focus of many of the intervention programs (Azad et al., 2021). At any stage of development, effective communication skills are critical for maintaining a high quality of life (Junaidi et al., 2021). While many develop verbal communication abilities, close to one-third of the children with ASD rely on non-verbal or pre-linguistic forms of communication behaviors well beyond their infancy. Often labeled as minimally verbal, these children have less than 30 functional words in their verbal repertoire for their daily communication needs, despite receiving early intensive intervention (Jacob & Ashok, 2014). Given parents' continued emphasis on communication abilities of their children, significant delay in communication skills might

continue to worry parents, which might increase their existing parenting stress (Garnett et al., 2022). For example, much of the intervention research notes a relationship between parenting stress and communication abilities, wherein a unit-decrease in one results in the unit-increase in the other (Goedeke et al., 2019; Shalev et al., 2020). However, the information in the literature shows a mixed association between parenting stress and child communication abilities (Clauser et al., 2021).

Scattered evidence on the transactional relationship shared between parenting stress and communication abilities exists in the literature; however, our understanding of the factors that moderate this relationship is lesser well-known (Ilias et al., 2018; Özgür et al., 2018). Parent's cultural orientation, that is, if they appreciate *Collectivist* or *Individualist* values, significantly influences access to childrearing resources, which in turn affects parenting stress (Chen et al., 2019). In collectivism, individuals prioritize group goals over individual needs, whereas individualism is characterized by a greater focus on individual needs rather than complying with community values (Al-Hassan et al., 2021). For example, parents practicing *Collectivist* culture might receive support from extended family towards childrearing that might not be readily available to parents practicing *Individualist* culture (Ilias et al., 2018). Optimizing communication development, especially for those children who are minimally verbal, will require an understanding of the role played by parent's cultural orientation on parenting stress as well as child communication abilities (de Leeuw et al., 2020).

In the review of the literature presented below, I discuss signs and symptoms, as well as common co-occurring conditions of ASD. Next, I review the literature and discuss the communication abilities in children with ASD, with an emphasis on children with minimal verbal abilities. Next, I discuss the socio-cultural theory of child development and extend the

discussion to children with ASD, including interrelatedness of child abilities, parenting stress, and parents' cultural values. At the end of this section, I present the study rationale and purpose.

Autism Spectrum Disorder

In 1943, Dr. Leo Kanner, an Austrian-American psychiatrist and a physician, coined the term "autism" based on 11 children who showed similar deficits in social interactions (Kanner, 1943). Initially, autism was known as a cluster of similar but distinct disorders, with children often described as highly intelligent and possessing verbal communication abilities (Kanner, 1971). Over the years, the clinical and scientific communities have developed a deeper understanding of the signs and symptoms that are evident in the editions of the *Diagnostic and Statistical Manual of Mental Disorders (DSM;* Volkmar and Reichow 2013). As of the fifth edition of *DSM (DSM-5),* ASD is described as a single disorder with a spectrum of symptoms with a core deficits in social communication abilities and restricted and repetitive behaviors (Grzadzinski et al., 2013). Ever since the discovery, ASD prevalence has shown a rapid increase, partly because of our improved understanding of the symptoms and signs (Maenner et al., 2014). For example, between the 2008 and 2018 surveillance years, the prevalence of ASD doubled from 1 in 88 to 1 in 44, respectively (ADDM Network). While ASD is a global phenomenon, the epidemiological and the changing prevalence data have predominantly emerged from a few countries that have the infrastructure to maintain consistent surveillance (Wallace et al., 2012). Although the prevalence is not accurate, the current global estimate of ASD is 1 in 160 children (Cooke et al., 2020).

ASD is a type of neurodevelopmental disability, which are defined by early onset of developmental deficits that affect adaptive behaviors required to function independently in day-to-day lives (Doernberg & Hollander, 2016). Another striking feature of ASD is its

pervasiveness of severity (Constantino & Charman, 2016). ASD severity is measured based on the degree of support the children require for their daily functioning (Mehling & Tassé, 2016). In addition, children with ASD also exhibit a number of co-occurring conditions that further affect their daily functioning and independence (Lai et al., 2019). These conditions include attention-deficit/hyperactivity disorder, maladaptive behaviors, sleep disturbance, and food selectivity that affect bladder and bowel movements (Rosen et al., 2018). Additionally, language delay is also a common co-occurring condition both in terms of receptive and expressive language delay (Delehanty et al., 2018). While the spectrum of biological and behavioral symptoms in ASD introduces undeniable influences on the developmental trajectories, socio-cultural factors also play a significant role in the prognosis of ASD (Balboni et al., 2021). For example, many of the parents from India often delay intervention services for their children by doctor shopping to confirm diagnosis or attributing the social communication delay in their children to shyness or prevalence of late talkers in their family (Mahapatra et al., 2019).

Autism Spectrum Disorder and Communication Abilities

The focus on communication abilities from the standpoint of ASD diagnosis has considerably shifted over the years (Rosen et al., 2021). Previously considered as a core feature of ASD, in the current diagnostic era, communication and language deficits are considered as a co-occurring condition resulting from social communication deficits (Al-Beltagi, 2021). Similar to other aspects of ASD, communication impairment shows substantial heterogeneity across children (Riva et al., 2021). Developmental changes in communication abilities are measured in terms of changing complexity, and children with ASD show impairment in form, function, and frequency of communication skills (Salley et al., 2019). Children with ASD struggle with both acquisition and mastery of verbal and non-verbal forms of communication skills (Howard &

Sedgewick, 2021). For example, children with Minimal Verbal Abilities and ASD (MV-ASD) struggle to master verbal communication skills (Delehanty et al., 2018). These children also struggle with mastering diverse functions of communication, with a significant delay in joint attention (JA) and, to some extent, Behavioral Regulation (BR) communicative functions (Stallworthy et al., 2021). JA communicative behaviors demands attention of the communication partner(s). For example, when a child pointing to direct attention of a communicative partner to a toy of interest. BR communicative function is used to request changes in the behavior of the communication partners (Salley et al., 2019). For example, when a child points at a toy and then looks back at the communicative partner that conveys their request to play with the toy. Many of the children with ASD also demonstrate difficulty in multi-model communication acts that require them to combine diverse forms and functions of communication to form complex communicative behaviors (e.g., using a gesture along with words or vocalization; Keen et al., 2016).

Communication Skills in Minimally Verbal Children with Autism Spectrum Disorder

In early childhood, typically developing infants use pre-symbolic communication to express their internal state, such as crying when in discomfort, which is often unintentional (Ćalasan & Jovanović, 2018). Children with MV-ASD exhibit a protracted use of pre-symbolic communicative behaviors, along with a delay in mastering the forms and functions of communication (Febriantini et al., 2021). Even within this subgroup, some children develop limited verbal communication skills and use single words, others might only use non-word vocalizations, gestures, or eye gaze at low frequency and in restricted contexts (Koegel et al., 2020). While some intervention programs, especially those that target joint attention skills, assist in verbal communication development, most children with MV-ASD remain in early stages of

communication well beyond their adolescence (Basso et al., 2021; Slušná et al., 2021). Much of the difficulty in addressing the needs of children with MV-ASD emerges from the extremely limited research on their language and communication skills (Hus & Segal, 2021).

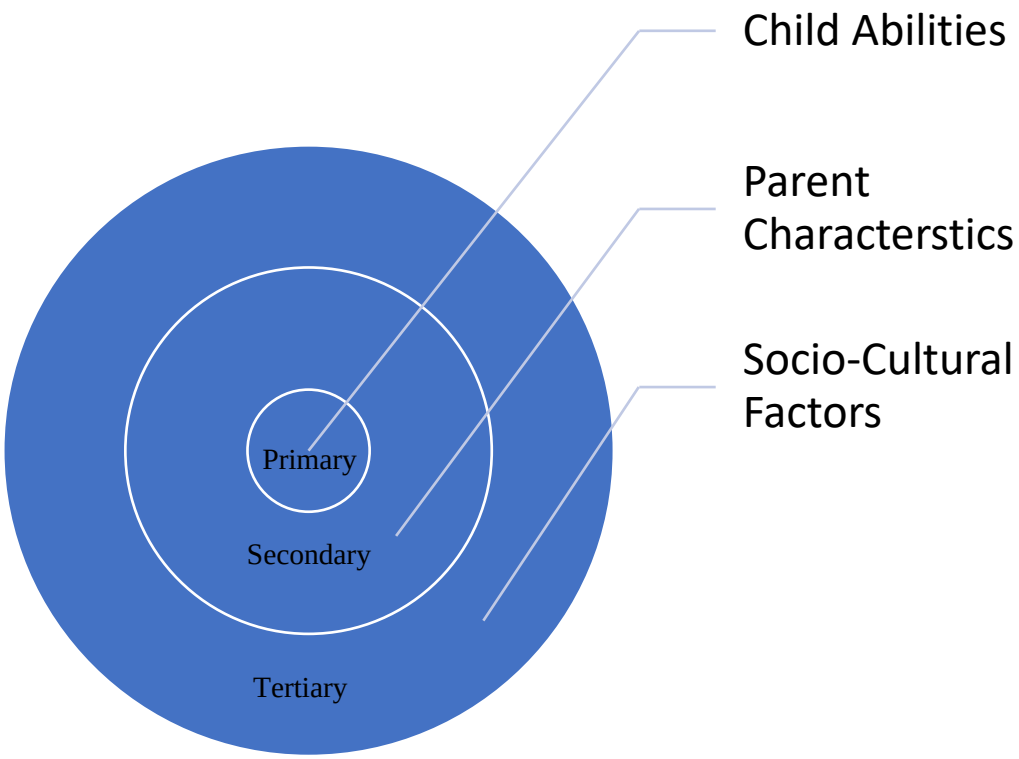
Socio-Cultural Theory of Communication Development

According to the socio-cultural theory of learning, achieving competence in developmental abilities, including communication abilities, requires a synergy between individual abilities, social interaction, and socio-cultural contexts (See Figure 1; Crowley, 2017). Early developmental abilities, as well as the early developmental trajectories, predict later language development in children (Friedman et al., 2014). For example, children who babble early also develop early verbal communication skills (Edmunds et al., 2019). Scientific evidence suggests that the nature of social interaction, especially in the early developmental stages, influences communication developmental trajectories in children (Hakanen et al., 2019). Specifically, communication development significantly relies on the amount of language input and exposure children receive during their infancy and childhood (Walker et al., 2020). For example, in early childhood neglect incidences, children show a delay in their later language development because of the poor quality and quantity of early social interactions (Brown & Ward, 2014; Frederico et al., 2018; Stamoulis et al., 2015). The quantity of interaction is the amount of exposure, and the quality is a measure of attributes of the caregiver-child interactions that promote communication development (Vaterlaus et al., 2019). Although the quantity of interactions is critical, the quality of interaction is highly significant in early development (Sheehan et al., 2019). Specifically, the ability of the parents or caregivers to provide frequent, immediate, and consistent responses (high parental responsiveness) to child communicative

behaviors are desired attributes that positively influences communication development in children (Anis et al., 2020).

Figure 1

Socio-Cultural Theory of Development and Learning in Children



Parent or caregiver characteristics and cultural factors shape the quality and quantity of interactions and language input children receive (Chan & Mo, 2021; Giannotti et al., 2021; Miao et al., 2018). When examining parent characteristics, stress emerges as a factor considerably affecting parent-child interaction, and thereby the quality and quantity of language input. Parents who experience high stress are less inclined to interact with their children, which in turn affects the quantity of interaction (Dennis et al., 2018; Miao et al., 2018; Postorino et al., 2019). Additionally, high parenting stress also reduces the quality of parent-child interaction by affecting parental responsiveness (Ward & Lee, 2020), involvement (Williams et al., 2020), tolerance, and co-regulation (fondness and closeness; Azhari et al., 2019; Guo et al., 2021). Parenting stress has also been observed to change parenting styles, with higher stress increasing the use of authoritarian parenting, where parents use hard and negative parenting strategies, which negatively affect developmental trajectories in children (Fonseca et al., 2020). Fringe effects of high stress include negative influence on parent well-being and family dynamics. For example, parents with high stress experience high depressive symptoms, anxiety, and marital stress (Huang et al., 2019; Ilias et al., 2018). Caregiver characteristics, especially parenting stress, produce a complex effect on both child and the parent functioning, including a noted negative impact on child communication development (Brisini & Solomon, 2021; Brown et al., 2020; Fredriksen et al., 2019). Understanding the interplay between parent characteristics and child development provides a critical perspective for developing effective strategies for optimizing child communication development (Schwartzman et al., 2021).

The socio-cultural factors in the child's environment largely inform parenting and childrearing practices as well as attributes of parent-child interaction, which shapes child communication developmental trajectories (Bornstein, 2019; Lansford et al., 2018; Pace et al.,

2017). To a large extent, parental expectations, including socialization goals and social judgment, which shape social-communication development in children, emerge as a function of cultural contexts (Lamm et al., 2018; Ren & Pope Edwards, 2016). Culture is an amalgamation of a variety of phenomena associated with physical environments, social expectations (values and belief systems), and personal traits (Germain & Knight, 2021). Physical environment presents communities with variable resources that shape human activities (Dubos et al., 2017). For instance, communities living near the coast might have significantly different food practices than those living in-land near the equator. On the other hand, social expectations are generated in consultation with a majority of the community members in a given environment, which in turn shapes parenting practices (Hu & Yeung, 2019; Lokot et al., 2020). For example, if a community appreciates a quiet and obedient child over a disobedient and a loud one, parenting might include appreciating child silence over loud behaviors. The broad definitions of physical environments and social expectations with multiple moving components presents practical difficulties in their use in research to study the cultural effects on child development (Chen et al., 2019). Research communities overcome these issues by studying personal traits by measuring individual responses to cultural scenarios (Gorodnichenko & Roland, 2017; Taras et al., 2016). In developmental research, this would include measuring parents' and children's personal traits to understand their reactions and attitudes to the larger cultural phenomena (Ilias et al., 2018). Cultural orientation refers to the alignment of an individual to either the *Collectivist* or *Individualist* cultural value system. When parents practice *Collectivist* cultural orientation, in which they value group- rather than self-priorities, they might greatly rely on opinions of the extended family to make child related decisions than parents practicing Individualist culture. For example, parents might request opinions of the extended family members when making

decisions regarding accessing intervention services, which directly influence development in children with ASD (Dinn & Sunar, 2017). While personal traits provide a more straightforward measure of culture than physical environment and social expectation measures in child development research, the relationship is still ancillary to parent characteristics (Chen et al., 2019; Zervides & Knowles, 2007).

Socio-cultural factors, including parents' personal cultural traits, influence parent characteristics both through direct and indirect channels (Dovgan et al., 2019). On the contrary, cultural effects on child development are only achieved through indirect channels and mediated through parent characteristics (Ilias et al., 2018). While rigorous and controlled cross-cultural studies on early development are limited, the available literature suggests that children show similar patterns of communication development irrespective of their cultural backgrounds but show differences in the frequency of early communicative acts (Fung et al., 2018). The majority of these differences are attributed to varying levels of language input provided through parent-child interactions that vary based on cultural practices of the parents (Nicolopoulou, 2019). Since the acquisition of communication competencies is critical for experiencing higher quality of life, to improve long-term outcomes in children with ASD who experience delay in communication skills we need a better understanding of the roles of parent and culture factors (Nomaguchi & Milkie, 2017, 2020).

Socio-Cultural Theory and Autism Spectrum Disorders

Understanding communication development in ASD through the socio-cultural theoretical perspective will examine factors important for working with children from diverse communities (Balboni et al., 2021; Nicolopoulou, 2019). Stated differently, predictors of communication developmental trajectories and intervention outcomes in children with ASD rely

on child abilities, parent characteristics, and cultural factors (Germain & Knight, 2021). Intact child abilities, such as cognition and attention, critically influence development and growth of communication skills and the external factors associated with parents and cultural values refine learning environments (Krishnan & Rollock, 2020). Knowledge about the interactions between child's abilities with each other and their interactions with other parent and cultural variables are crucial to develop a comprehensive understanding about the factors influencing child development, especially for children with MV-ASD.

Child Abilities in Autism Spectrum Disorders

Studies examining child abilities have identified several early developmental skills predicting later communication development in children with ASD (Tager-Flusberg, 2016; Trembath et al., 2020; Brady et al., 2021). Child factors such as ASD severity, cognitive skills, pre-verbal vocal behaviors, attention, and maladaptive behaviors predict communication developmental trajectories. For example, severe forms of ASD correlates with greater delays in language or communication development (Thurm et al., 2015). The earliest developmental skills, such as cognitive skills, vocal behaviors, and attention, also predict language or communication development (Brignell et al., 2018). In terms of cognitive abilities, Johnson et al. (2021) and several other researchers have observed a positive relationship between children's verbal IQ and communication abilities (Durrleman & Franck, 2015; Simonoff et al., 2020). A study by Trembath et al., 2021, that studied the prelinguistic vocal behaviors, discussed the importance of quality of vocalization on communication development (Brady et al., 2015; Chericoni et al., 2016; Woynaroski et al., 2016). Particularly, evidence across literature supports the importance of early vocal development for acquiring spoken language skills, as measured by the quality of prosody, tone, syllable repertoire, intonation, stress, and pitch (Iverson & Wozniak, 2016;

McDaniel et al., 2020). Additionally, infants with limited variabilities in vocal play behaviors also show delayed communication development (McDaniel et al., 2021). In terms of attention skills, typically developing children show increasing abilities to share attention; however, children with ASD exhibit delayed joint attention development (Adamson et al., 2019). This delay significantly affects the incidental and planned learning opportunities, and the degree of delay predicts communication development in children with ASD (Mundy, 2016; Stallworthy et al., 2021; Van Hecke et al., 2016; Basso et al., 2021; Gillespie-Lynch et al., 2015). Lastly, the well-documented link between communication skills and the maladaptive behaviors demonstrations a mixed relationship with each other (Postorino et al., 2019; Visser et al., 2017; Williams et al., 2018). Much of the research indicates a negative association, while other studies noted neutral relationship between the two variables (Williams et al., 2018). Some of the intervention studies note an improvement in communication skills with a decrease in externalizing maladaptive behaviors (Curtis et al., 2019).

Parent Stress and Child Abilities in Autism Spectrum Disorders

The second tier of the socio-cultural theory of learning emphasizes the role of family, more specifically caregiver's role in child learning and development. In ASD, a common variable influencing child development is parenting stress, which often exceeds clinically significant levels (Clauser et al., 2021). Parenting stress, unlike generic life stress, emerges only from being a parent. Factors like parental distress (PD), perceptions of difficult behaviors in children (DC), and dysfunctional parent-child interactions make up the components of parenting stress (Abidin, 1992; Bronfenbrenner, 1986). PD is based on the parents' satisfaction with their self-efficacy as a parent (Sanner & Neece, 2018). DC is a measure of parents' perception of the difficulty in managing their child's behaviors (Camisasca et al., 2019). Finally, the dysfunctional

parent-child interaction measures the parent's satisfaction with the quality of interactions with their children (Justice et al., 2019). The three sub-domains of parenting stress (PD, DC, and parent-child dysfunction) interact with each other and affect the parenting behavior, which then influences child outcomes (Callanan et al., 2021). Literature confirms a general negative correlation between the two (Ilias et al., 2018; Miranda et al., 2019; Schwartzman et al., 2021).

Children with ASD exhibit a spectrum of behaviors and developmental profiles, which also reflects in the level of parenting stress experienced by parents (Rodriguez et al., 2019). In terms of the core symptoms, the severity of ASD is positively linked with parenting stress, with higher severity resulting in higher parenting stress (Clauser et al., 2021). Similarly, emotional problems and maladaptive behaviors show a positive relationship with parenting stress (Holly et al., 2019; Miranda et al., 2019). In intervention studies where social interaction abilities have improved, a decrease in parenting stress is documented, showing a negative association between the two (Corona et al., 2019; Postorino et al., 2019). Similarly, cognitive abilities and communication abilities also show a negative association with parenting stress. A few studies that have directly examined the relationship between child's communication abilities and parenting stress indicate at a negative correlational relationship between the two (Giovagnoli et al., 2015).

Most of the studies on parenting stress have worked on verbal children with ASD (Haebig et al., 2013; Siegel et al., 2015). Therefore, the implications of such studies are more suitable for children who fit the average profile, rather than those with MV-ASD. We need more research that is specific to children with MV-ASD to refine intervention programs to match their specific needs (DiStefano et al., 2016; Pecukonis et al., 2019; Tager-Flusberg & Kasari, 2013; Trembath et al., 2020). Moreover, fewer studies consider the socio-cultural contexts that

influence the development of children with MV-ASD (Balboni et al., 2021). Therefore, the relationship between behavioral and developmental abilities in children with MV-ASD and parenting stress also needs to consider socio-cultural factors (Nguyen et al., 2019).

Socio-Cultural Contexts and Child Abilities in Autism Spectrum Disorders

Socio-cultural contexts largely dictate the distribution of resources that design learning environments which influence child development (Chen et al., 2019). Since parenting relies on the availability of resources, parents in cultural environments with richer support systems experience lower stress levels that create a conducive environment for child development (Solem, 2013). For example, unlike in an *Individualist* culture, parents in a *Collectivist* culture might receive higher amounts of childrearing support from their extended families that might reduce their parenting burden and improve the quality of interactions with their children (Ilias et al., 2018). Therefore, before discussing the relationship shared between child abilities and socio-cultural factors, outlining the interactions of parenting stress and cultural factors are essential, as they collaboratively facilitate child development (Balboni et al., 2021).

In the ASD literature, studies that focus on parenting stress are limited to Western or European contexts, creating greater awareness among its members when compared to non-Western environments (Wang et al., 2013). While diverse cultural backgrounds within these cultural contexts allude to differences in parent experiences, the wider diversity in cultural practices in a global context is often neglected (Ilias et al., 2018). For instance, the parenting resources between Asian and Western cultures significantly vary, manufacturing differences in child experiences across the two cultures (Lee & Chiang, 2018). Appropriating knowledge generated in the West to a non-Western context might offer ineffective and insufficient supports to address the needs of the children with ASD and their families living in non-Western contexts

(Shorey et al., 2020). The culture-specific nature of parenting stress produces differences in the amount of burden, effectiveness of coping strategies, and parenting competencies noted among the parents of children with ASD (Huang et al., 2019). In turn, these parenting experiences and resources change the course of child development (Madarevic et al., 2022). Cross-cultural research is an effective means to study the variabilities in the interactions between child abilities, parent characteristics, and socio-cultural contexts to identify factors that aid in communication development in children with MV-ASD (Giannotti et al., 2021).

Current study

In this quantitative study, I recruited parents of children with MV-ASD from South India and the Midwestern U.S. to study the relationship between child abilities, parenting stress, and parent's cultural orientation. Three hypotheses drive this research that focus on all three areas of socio-cultural theory of child development: abilities innate to children, social factor (parenting stress), and cultural factor (cultural orientation).

Hypotheses

Based on the evidence from the literature, the current study tested three hypotheses. The first hypothesis assessed the association between autism severity, maladaptive behaviors (externalizing), and adaptive behavior skills in children with MV-ASD. The secondary goal was to examine the relationship of parenting stress on child developmental abilities in children with MV-ASD. The main purpose of the study was to assess the influence of parents' cultural orientation on the association between parenting stress and communication skills in children with MV-ASD. Parent variables such as socio-economic status, highest education, employment status, race, linguistic backgrounds, marital status, and self-reported health status of the parents were also relevant for the purpose of the study.

H1: Child communication abilities, maladaptive behaviors (externalizing), and ASD severity will significantly correlate with each other. More specifically, a negative correlation between parent reported child communication skills with maladaptive behaviors (externalizing) and ASD severity will be evident in children with MV-ASD.

Rationale for H1: Communication abilities share a reciprocal relationship with the severity of ASD and maladaptive behaviors (Estabillo et al., 2018). Communication abilities are negatively correlated with the severity of ASD and maladaptive behaviors (Ellis Weismer & Kover, 2015; Lobban-Shymko et al., 2017). On the other hand, severity of ASD and maladaptive behaviors share a positive correlation with each other (Lindsey et al., 2020).

H2: Parenting stress will show a significant negative correlation with child communication, daily living, socialization, motor skills, and positive correlation with maladaptive behaviors (externalizing).

Rationale for H2: Parenting behaviors interact with child developmental trajectories (Deater-Deckard & Panneton, 2017; Geeraerts et al., 2021; Kopala-Sibley et al., 2020). In ASD, level of parenting stress significantly correlates with communication abilities (Edrisinha, 2012), maladaptive behaviors (Lin et al., 2021), socialization, and daily living skills (Postorino et al., 2019). While the communication abilities, socialization and daily living skills share a negetive relationship.

H3: Parents' cultural orientation (Individualist and Collectivist) will moderate the relationship shared between parenting stress and child communication abilities.

Rationale for H3: Child-rearing practices differ across various cultural systems (Nomaguchi & Milkie, 2017; Spencer, 2017). For example, under the Collectivist cultural practices that promote community (or group) goals, parents may receive support from extended family members

towards daily childcare needs. On the other hand, parents in Individualist culture might rely on external childcare support, which increases financial burdens (Al-Hassan et al., 2021). Parenting choices influences the quality, type, and availability of resources, which in turn predicts mental health well-being of the family (Ingoldsby, 2010). Therefore, parents' cultural values might moderate the relationship between parenting stress and child abilities, including child communication abilities.

Chapter 2: Method

Participants

The participants in the current study represented two geographical locations: South India and the Midwestern U.S. While cautioning the readers of overgeneralization, in the rest of this section I discuss properties of language, culture, and disability evident in South India and the Midwestern U.S. followed by inclusion criteria and demographic details.

South India

Five states in the southern part of India make up the region often referred as South India: Andhra Pradesh, Karnataka, Kerala, Tamil Nadu, and Telangana. The land labelled as South India makes up 19.3% of India, which falls within the peninsular Deccan Plateau and roughly translates to 245,480 square miles. Around 20% of the Indian population (252,000,000) reside in South Indian region. Most of the population identifies with Hindu (84%), followed by Muslim (11%), and Christian (4%) religion. Post-independence from Britain, South India experienced a rapid growth in economy and literacy. In terms of climate, South India has a tropical weather throughout the year, with a mean temperature of 64 °F. In terms of occupation, most from the rural areas work in agriculture while those in Urban areas work in a variety of occupations including manual labor, housemaids, etc. Among women, especially mothers, 80% are housewives. More than 70% of the families live in a joint family set up, which most often include parents, children, and grandparents (Thomas et al., 2007).

Telugu, Tamil, Kannada, and Malayalam are the languages most widely spoken in South India and are a part of the Dravidian language group. These languages are verb-dominant, which increases parent's scaffolding communication development in their children more than those from the West. Additionally, children in South India also understand and learn verb-vocabulary

earlier than their counter parts from the West (Krupa et al., 2019). In terms of disability, most individuals in South India attribute disability as a result of the carelessness of the family members and/or individual with disability or believe in superstitions (Bandla et al., 2017). In addition, many families of children with disabilities are a single income household because of limited professional supports (e.g., formal education) (Limaye, 2016). Limited fiscal support significantly affects the family's quality of life. Rehabilitative services that benefit children with disabilities are financed by the family, unlike health insurance which provides financial support for essential services in the U.S. (Brezis et al., 2015; Kumar et al., 2012). Limited family income also affects the ability to afford these services that increases the family's childcare burden which results in only one parent (typically father) working and while the other assumes the role of the homemaker (typically mothers) to take care of the child (Kaniamattam & Oxley, 2021).

Midwestern U.S.

Making up one of four census regions in the U.S. the Midwestern region also known as the Midwest or American Midwest include 12 states: Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin. Midwest is situated in the North Central Region of the U.S. and is roughly 821,000 square miles with a population of 68,995,685 (U.S. Census Bureau, 2020). Most people speak English as their primary language and other minority language include German, Spanish, and Chinese (U.S. Census Bureau, 2015). Unlike South Indian languages, many of the Midwestern language (e.g., English, German, and Spanish) are a part of the Indo-European language family. In terms of religion, a majority identify with Christianity, with far less identifying with Judaism. Midwestern U.S. has a humid temperate climate with temperature between 85°F and -15°F across the year. Similar to South India, most people in the rural Midwest are in the farm labor force and those

from Urban areas hold a variety of occupations. Employment culture shows that both fathers and mothers hold either a full-time or part-time employment (Glass, 2004).

Inclusion and Demographics

The study recruited parents of children with a confirmed or a suspected diagnosis of ASD between the ages of 4 and 11 years with minimal verbal abilities. For the study purpose, children who used 30 or fewer functional words and communicated predominantly through single-word and/or prelinguistic forms of communication on a daily basis were considered minimally verbal. The verbal abilities of the children were confirmed based on parent reports of verbal abilities and the assessment outcome from the *Communication Matrix* assessment (Rowland, 2011). During the recruitment process, parents of two or more children with ASD were excluded. Power analysis was performed using G*Power that indicated 68 participants were required to determine a medium effect size to test the three proposed hypotheses of the study (d = .50; Faul & Erdfelder, 1992; Tabachnick & Fidell, 2011; Warner, 2012). A total of 70 parents were recruited, 35 each from South India and the Midwestern U.S. Only the primary caregiver (here on referred to as parents), i.e., the parent that held 50% or more child-rearing responsibilities, in terms of direct care, protection, and supervision of a child with ASD were included in the study. All parents were required to speak English to participate because of the psychometric properties of the standardized assessment used in the current study (discussed more in detail below).

The participating parents provided demographic information in terms of geographical location, state of residency, age, gender, parental role, race, religion, education, and employment. The parents also shared information regarding their linguistic abilities in terms of primary language and other linguistic backgrounds. Along with the demographic details, the parents also provided self-rating of their overall health on a 5-point Likert scale: 5-excellent, 4-very good, 3-

good, 2-fair, 1-poor. Table 1 presents the demographic details and Table 2 presents geographical and racial information about the parent participants.

Table 1

Demographic Details of the Parent Participants

Parent Demographic information	South India		Midwestern U.S	
	Count	Percentage	Count	Percentage
Caregiver Designation				
Mother	33	94.30%	33	94.30%
Father	2	5.70%	1	2.90%
Grandparents	0	0%	1	2.90%
Gender				
Male	2	5.70%	1	2.90%
Female	33	94.30%	34	97.10%
Age				
20-29 years	1	2.90%	4	11.40%
30-39 years	31	88.60%	19	54.30%
40-49 years	3	8.60%	10	28.60%
50 years and above	0	0%	2	5.70%
Parent Education				
Diploma	2	5.70%	0	0%
Some College	0	0%	3	8.60%
Undergraduate	14	45.70%	20	57.10%
Graduate	19	54.30%	11	31.40%

Doctorate	0	0%	1	2.90%
Parent Employment				
Full Time	6	17.10%	22	62.90%
Part Time	1	2.80%	3	8.60%
Self-Employed	4	11.40%	1	2.90%
Student	1	2.80%	3	8.60%
Homemaker/Stay at Home	25	71.40%	8	22.90%
Unemployed	0	0%	1	2.90%
Marital Status				
Single	0	0%	6	17.10%
Married	33	94.30%	19	54.30%
Divorced	0	0%	6	17.10%
Domestic Partner	0	0%	3	8.60%
Widowed	1	2.90%	0	0%
Other	1	2.90%	1	2.90%
Linguistic Abilities				
Monolingual	0	0%	22	62.90%
Bilingual	7	20%	11	31.40%
Multilingual	28	80%	2	5.70%
Religion				
Hindu	30	85.70%	0	0%
Christianity	3	8.60%	26	74.30%
Muslim	2	5.70%	1	2.90%

Agnostic	0	0%	2	5.70%
Not Religious	0	0%	8	22.80%
Overall Health				
Excellent	2	5.70%	2	5.70%
Very Good	4	11.40%	10	28.60%
Good	17	48.60%	15	42.90%
Fair	11	31.40%	8	22.90%
Poor	1	2.90%	0	0%

Note. Demographic details of the participants across the two groups – South Indian and the Midwestern U.S.
N = 70

Table 2

Geographical and Racial Identities of the Participants

Location and Race	Count	Percentage
South India[a]		
Andhra Pradesh	1	2.80%
Kerala	2	5.70%
Tamil Nadu	6	17.10%
Telangana	1	2.80%
Karnataka	25	71.40%
Midwestern U.S.[a]		
Indiana	3	8.60%
Illinois	8	22.90%
Michigan	5	14.30%
Ohio	3	8.60%
Wisconsin	4	11.40%
Kansas	4	11.40%
Minnesota	4	11.40%
Missouri	3	8.60%
North Dakota	1	2.90%
Racial Identities[b]		
South Asian	35	50%
White/Caucasian	24	34.30%
Black/African American	3	4.30%

Asian	1	1.40%
Hispanic or Latino	5	7.10%
Others	2	2.90%

Note. Geographical and Racial Identities of the participants
[a]n = 35; [b]N = 70

Although the children did not directly participate in the data collection process, parent reported child demographic information were gathered. Parents shared information on the child's age, gender, birth order, education, and language exposure. Additional information on age at diagnosis, type of diagnosis, communication abilities, communication modalities, and other details about the intervention services were also gathered. Finally, family information in terms of number of siblings, sibling diagnosis, and number of family members at home were also recorded. Table 3 presents details about the demographic identities, intervention services, and family details of the children.

Table 3

Demographic Details of the Children

Child variables	South India (n = 35)		Midwestern U.S. (n = 35)	
	Count	Percentage	Count	Percentage
Age				
4-6 years	20	57.10%	16	45.70%
7- 11 years	15	42.90%	19	54.30%
Gender				
Male	28	82.40%	26	74.30%
Female	6	17.60%	9	25.70%
Communication				
Speech	33	94.30%	35	100%
SGD*	3	8.60%	21	60%
PECS	5	14.30%	12	34.30%
Sign Language	0	0%	13	37.10%
Language Exposure				
Monolingual	1	2.90%	30	85.70%
Bilingual	23	65.70%	5	14.30%
Multilingual	11	31.40%	0	0%
Age at diagnosis				
Less than 2 years	2	5.70%	2	5.70%
2 years	20	57.10%	17	48.60%
3 years	10	28.60%	13	37.10%

4 years	2	5.70%	2	5.70%
5 years and above	1	2.90%	1	2.90%
Type of Diagnosis				
Educational	0	0%	3	8.60%
Medical	23	65.70%	18	58.60%
Clinical	9	25.70%	13	31.40%
Suspected	3	8.60%	1	5.70%
Educational Setting				
Regular School (inclusive)	8	22.90%	3	8.60%
Special School	13	37.10%	4	11.40%
Special Unit in Public School	2	5.70%	21	60%
No School	12	34.20%	7	20%
Speech Therapy Services				
Not Receiving Services	6	17.10%	5	14.30%
Receiving Services	29	82.90%	30	85.70%
Occupational Therapy Services				
Not Receiving Services	13	37.10%	6	17.10%
Receiving Services	22	62.90%	29	82.90%
Physical Therapy Services				
Not Receiving Services	32	91.40%	28	80%
Receiving Services	3	8.60%	7	20%

Note. Demographic details of the children, including details about the intervention services.

Materials and Instruments

Quantitative data were gathered using standardized instruments that screened for inclusion, measured parenting factors, and assessed child abilities. Screening for inclusion included three measures to assess the eligibility of the potential participants using P*arent Interview Questionnaire*, the *Social Communication Questionnaire* (*SCQ*; Rutter et al., 2003), and the *Social Responsiveness Scale Second Edition* (*SRS-2*; Constantino & Gruber, 2012). The *Communication Matrix* (Rowland, 2011) was used to confirm the verbal abilities in children with ASD. The developmental abilities of the children were assessed using the *Vineland Adaptive Behavior Scale-III* (Vineland-III; Sparrow et al., 2005). The parent data were collected using the *Parent Stress Index, Fourth Edition - Short Form* (PSI-4-SF; Abidin, 2012), *Scenario-Based Culture Orientation Measure* (*COS-SM*; Triandis et al., 1998), and the *MacArthur Scale of Subjective Social Status* (Adler & Stewart, 2007), respectively. Within India, English is used as an official language (Kalia & Reese, 2009), therefore, all the instruments used in this study were administered in English for both groups of parents.

Instruments for Assessing Eligibility

Eligibility to participate was confirmed using the several instruments: the *Parent Interview Questionnaire*, *Social Communication Questionnaire* (SCQ; Rutter et al., 2003), *Social Responsiveness Scale, Second Edition* (*SRS*-2; Constantino & Gruber, 2012), and *Communication Matrix* (Rowland, 2011). Details about these instruments, along with relevant information about their psychometric properties for use in cross-cultural settings, are discussed below.

The *Parent Interview Questionnaire* (see Appendix E) was developed for the purpose of this study and to measure preliminary details for assessing participant eligibility. The Questionnaire included 63 items that gathered parent and child demographic details. The child demographic details were further divided into (1) *general details*: age and sex at birth, (2) diagnosis: age at ASD diagnosis and type of diagnosis, (3) *rehabilitative services and education,* (4) *abilities:* communication, visual, and hearing, and (5) *linguistic background:* home language, language exposure, and languages used in intervention programs (e.g., speech and language therapy). Parent demographic details included age, gender (biological sex), caregiving title, highest education, employment, religion, linguistic background, employment status, racial backgrounds, marital status, and number of children.

The *Social Communication Questionnaire* (*SCQ*; Rutter et al., 2003) is a 40-item screening tool which focuses on communication abilities and social functioning in children. This parent reported form has two versions: Lifetime and Current. The Lifetime version measures the child's functioning across the life span. The Current version measures the social functioning of the children as observed during that last 3 months from the date of the interview. The *SCQ* has a high correlation with Autism Diagnostic Interview, Revised ($r = .71$, $p < .001$; Berument et al. 1999) and short administration time make the *SCQ* an ideal ASD screening instrument. Receiving a score of 15 or higher on the *SCQ* indicates the individual is at risk of ASD in both India (Rudra et al., 2017) and the U.S. (Rutter et al., 2003). The sensitivity and specificity of the *SCQ* in suspecting ASD is high in children 4 years or older (Fernandopulle, 2011), making the instrument appropriate for screening for ASD in the current sample. Children that received a score of 15 or more on the *SCQ* or had an official diagnosis of ASD were included in the study.

The *Social Responsiveness Scale, Second Edition* (*SRS*-2; Constantino & Gruber, 2012), developed based on DSM-V, is a 65-item parent rating scale that measures the severity of social impairments in children with ASD (Constantino & Gruber, 2012). There are four forms divided across three age groups - preschool (2-6 years), school-age (4-18 years), adult (19-89 years). The school-age form was used for the current study, which complimented the age range of the children (4-12 years). The *SRS*-2 assess five domains - Social Awareness, Social Cognition, Social Communication, Social Motivation, and Restricted Interests and Repetitive Behaviors. The items under each domain are rated on a 4-point Likert scale: 1-not true, 2-sometimes true, 3-often true, or 4- almost always true. The *SRS*-2 has demonstrated good internal consistency with a reliability coefficient of .95 suggesting consistency across items and an inter-rater reliability correlation of .77 for English-speaking population (Constantino & Gruber, 2012). The *SRS* when administered in English, received a sensitivity of 76% and specificity of 67% for the screening of ASD. The *SRS* has been extensively used to assess ASD in India (Jacob & Ashok, 2014; Kumar et al., 2016; Rao & Mysore, 2018) and among diverse population within the U.S. For analysis purposes, the t-score from the *SRS*-2 was used as a measure of ASD severity.

The *Communication Matrix* (Rowland, 2011) uses parent reports to measure communicative functions in children, such as rejecting items and activities, obtaining items and activities (Behavior Regulation; BR), engaging in social interactions, and seeking and providing information (Joint Attention; JA). The instrument was designed specifically to measure expressive communication skills in children with minimal verbal abilities. The highest mastered scores from the Communication Matrix reflect the average communication abilities of the children with MV-ASD. The average scores of the highest level mastered across both

communication functions: BR and JA were used to compare the communication scores across the two groups (Brady et al., 2012).

Measures of Child Abilities

The *Vineland Adaptive Behavior Scale-III* (*Vineland-III*; Sparrow et al., 2005) measures the adaptive behaviors using a semi-structured interview format. The *Vineland-III* offers three forms: Interview, Parent/Caregiver, and Teacher. For the current study, the parent/caregiver interview form was used to measure parent reported child communication, daily living, and socialization skills. The instrument provides an overall adaptive behavioral composite (ABC) score for each child. Apart from core-measures, the instrument also measures motor skills in children aged 10 years or below. Finally, the instrument measures internalizing and externalizing maladaptive behaviors in children. The parents rated most of the interview statements on the Vineland-III using a 3-point Likert scale: 0-never, 1-sometimes, and 2-usually or often; however, some questions were measured as a yes or no response. The first edition of the scale included normative samples that were representative of individuals with diverse disability, including individuals with ASD who are nonverbal (Carter et al., 1998). Although the *Vineland-III* is developed and standardized for the Western population, the instrument has been used in other than English language by bilingual interviewers in non-Western countries, including in the Indian context (Manohari et al., 2013). In the U.S., the *Vineland-III* was standardized on a diverse racial and ethnic sample population. The internal consistency coefficients for adaptive sub-domain and the ABC scores of the *Vineland-III* are .94 and .99 for all age groups. The test-retest reliability across all ages ranged from the corrected r value of .64 to .94 (Pepperdine & McCrimmon, 2018). For this study, the two geo-cultural groups were compared using the standard domains scores of *Communication, Daily Living, Socialization, Motor,* and *Adaptive*

Behavior Composite. *Maladaptive behavior* domain scores were compared between the two groups of children using the *v*-scores associated with internalizing and externalizing maladaptive behaviors.

Measures of Parenting Factors

The *Parent Stress Index Short Form Fourth Edition* (PSI-SF-4; Abidin, 1990) is a three-factor derivative of the *Parent Stress Index Fourth Edition,* that measures three domains contributing towards parental stress: Difficult Child (DC), Parent Distress (PD), and Parent-Child Dysfunctional Interactions (PCD-I). The form uses a 5-point Likert scale: 1-strongly agree, 2-agree, 3-not sure, 4-disagree, and 5-strongly disagree. The 36-item interview have been used in research both in Indian and the U.S. (Biswal et al., 2010; Menon et al., 2013; Wurster et al., 2019). The original PSI has also shown generalizability among lower socio-economic populations within U.S. (Mash & Johnson, 1983). In this study, the total stress score (PS-T) will be used as a measure of parenting stress.

The *Scenario-Based Culture Orientation Measure (COS-SM; Triandis et al., 1998;* see Appendix F*)* was developed based on the Individualism-Collectivism (IND-COL) scale (Singelis et al., 1995) and the Cultural Orientation Scale (COS; Triandis and Gelfand 1998). Although the cultural orientation is more commonly measured using the attitude-based scale, the realistic scenarios used in the *COS-SM* reduces response bias (Triandis et al., 1998). The *COS-SM* categorizes an individual's cultural orientation as either *Individualist* or *Collectivist (Hofstede, 1980).* Individualist cultures value individual goals, on the contrary, the *Collectivist* culture promotes group goals (Kagitcibasi, 1997). Arranged marriage, where a person marries the person of the elder's choice is an example of *Collectivist* culture, whereas a culture where a person can freely marry a person of their choice irrespective of their parents/family's approval is an example

of Individualist culture. The *COS-SM* typically measures cultural orientation as Horizontal Individualism (HI), Vertical Individualism (VI), Horizontal Collectivism (HC), and Vertical Collectivism (VC). These four cultural orientations differ in terms of the relationship with life goals and their perceptions of each other. While those practicing HI and VI both appreciate individualistic goals, the former sees each other as equal, and the latter sees others as inequal from themselves. The difference between HC and VC is on the individual's view of others within their in-group. For example, those practicing HC appreciate group goals and see their in-group members as equal to each other; whereas VC sees the members within their in-group as inequal to each other.

For the purpose of this study, the *COS-SM* was used to group participants into either the *Individualist* or *Collectivist* cultures orientation. A total *Individualist* score was developed that reflected the total number of *Individualist* options highly prioritized by the participants across the 16-questions. A score of 9 or above reflected *Individualist* cultural orientation and 8 and below reflected a *Collectivist* cultural orientation. For the analysis purpose, the continuous total score from the *COS-SM* reflecting *Individualist* scores was used as a measure of the participants' cultural orientation.

The MacArthur Scale of Subjective Social Status (*Subjective SES*; Adler & Stewart, 2007; see Appendix G) is a subjective measure of an individual's social status. A robust association has been established between the subjective measure of socio-economic status (Wurster et al., 2019) and health outcomes (Ferreira et al., 2018). Objective measures of SES prove impractical for use in cross-national research settings because of the variability in income brackets and social class structure (Präg et al., 2016; Quon & McGrath, 2014). The subjective measure of SES improves the ability to assess social class as a product of health, culture, and class, which is ideal when

working with cross-national population. *The MacArthur Scale of Subjective Social Status* include two versions: *the adult* and *the youth.* In the current study, the parent participants responded to *the Adult version* of the SES instrument. The subjective SES score was used when comparing sample distributions between the two geo-cultural groups.

Procedure

To assess the feasibility of the study procedure, a pilot study was conducted with two families from India that confirmed the participation time of up to 4 hours. This also helped to determine the appropriate monetary compensation for both geographical locations (discussed more in detail below). The pilot participants also provided feedback that helped add and/or modify the items and responses of the *Parent Interview Questionnaire*. The modified study procedures were then shared with the Institute Review Board (IRB) for approval at the University of Kansas.

After receiving the IRB approval, I focused on building my professional network to identify potential participants for the study. Anticipating difficulties associated with COVID-19 outbreak, I focused on collecting data from South India before proceeding to recruit parent participants from the Midwestern U.S. For the recruitment of participants, I used my pre-established professional network, which was developed through the interactions with research, clinical, medical, and educational professionals in India. These previously established connections assisted me in expanding my professional network for the recruitment process. Additionally, I also conducted a survey study, wherein I documented the opinions of the speech-language pathologists, special educators, psychologists, and paraprofessionals on their clinical practices when working with children with MV-ASD. At the end of the survey, interested professionals shared their contact details. During the recruitment process in India, I contacted

over 150 professionals who shared the study details with potential participants. Connecting or reconnecting with professionals included an initial contact via a phone call or a text message. Once the professionals agreed to help with the recruitment, an email with the study details were shared with the professionals (see Appendix A & B). I also requested feedback and opinions of the professionals about the research, which increased their sense of agency towards the study. In addition, I shared details about myself to build a stronger relationship with the professionals. Specifically, I shared details about my professional credentials, my motivation, and passion associated with the study, my intentions with the findings, the city of my birth and life experiences, and other details that made a personal connection with the professionals. For recruiting participants from the Midwestern U.S., I identified organizations working with children with developmental disabilities across each of the 11 states included in this study. These organizations were identified on the Autism Speaks, Autism Society, Indiana Disability Resource Finder, RUSH Autism Resource Directory, Autism Alliance of Michigan, Missouri Department of Mental Health, and Autism Society of Minnesota Resource Directory websites. An email was sent to the identified centers or organizations, which included a brief overview of the study along with a request to share the information with potential participants. The emails to the centers were sent during a weekday between 9:00 AM and 12:00 PM for maximizing the responses. Recruitment also included sharing details on social media pages dedicated to supporting parents of children with ASD. Additionally, some of the organizations that worked with children with ASD also shared the study details on their official social media pages in addition to their websites.

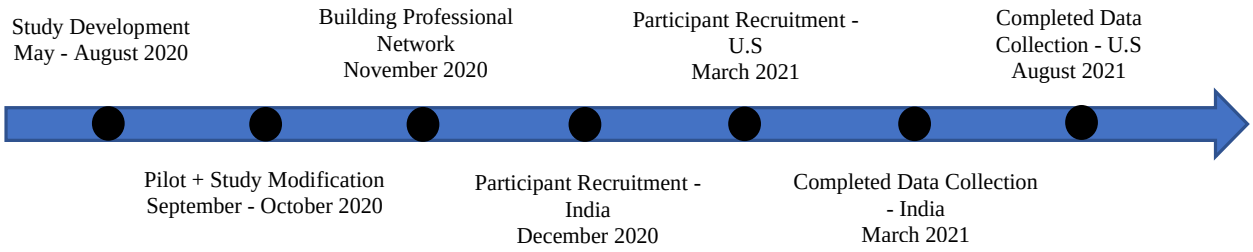
Parents interested in the study connected with me in one of three ways: direct email connection, filling out an interest form, or through the professionals. The participants who filled

out the interest form were automatically directed to the online consent form on the REDCap software platform. For the other parents, the recruitment documents were sent by email (see Appendix C & D). After receiving a signed consent form, an initial call was scheduled for assessing eligibility. During this call, I shared an overview of the study, requested verbal consent, and clarified questions of the parent participants (Barata et al., 2006). I also prioritized building a trusting relationship with the participants by citing the professional's support (if applicable), highlighted the significance of the study, and shared study intentions. On a personal level, I shared details about my passion and commitments with the study area, provided information about my professional credentials and professional experiences. For parents in India, irrespective of their decision to participate, when appropriate and as requested, I offered to stay in touch and provide professional consultations on challenges associated with communication abilities in their children.

After completing 50% of the data collection in India, I began focusing on recruiting participants from the Midwestern U.S. Unlike India, I lacked pre-established professional connections in the Midwestern U.S. and my initial 6 months of efforts resulted in the recruitment of less than 20% of the needed participant sample. In order to improve recruitment, I made several modifications that were in consultation with the dissertation advisor and committee members. The initial study procedures provided monetary compensation of $40 and had an age cap of 45 years for caregivers and 10 years for children with MV-ASD. The modified study procedures increased the monetary compensation by $10, removed the age restriction for the caregivers, and changed the upper age limit to 12 years for children with ASD. Following these changes, within the next three months, 80% of the participants were recruited, which concluded the data collection process. Figure 2 provides an overview of the recruitment timeline.

Figure 2

Data Collection Timeline



Data Collection Process

After receiving the written consent from the parents, a Zoom audio meeting was scheduled at a mutually convenient time for assessing participant eligibility. During the first Zoom audio call, the study process was explained, including information about the anticipated participation time and an overview of the assessment procedures. In the first Zoom meeting, eligibility was confirmed using the *Parent Interview Questionnaire*, *SCQ*, and *SRS-2*. On a second call, child abilities were assessed using the *Communication Matrix* and *Vineland-III*. On a third and final Zoom meeting, the parent measures were assessed using the *PSI-SF-4*, *COM-SM*, and *subjective SES*. Most of the parents completed the study requirements over three Zoom meetings, but some completed the assessments either on a single or across several Zoom meetings, depending on their availability. Irrespective of the number of Zoom audio calls, all study related data were collected within two weeks of the initial meeting. Post study, each participant received reports based on the *Communication Matrix* and *Vineland-III* assessments along with a monetary compensation of $40-50 for participants in the U.S. and $10 (₹750) for participants in India. The appropriate amount of monetary compensation was determined based on the feedback from pilot participants, living costs, and evidence from the literature in order to

avoid undue enticement of the participants across the two geo-cultural groups (Largent et al., 2012).

All eligible and consenting participants in India completed the study requirements, resulting in a 100% retention rate. A critical factor for achieving this success was building a strong relationship with the participants. I used local dialect and participants' primary language for non-study related communications. When explaining the study, I avoided using jargons and provided the participants multiple opportunities to ask questions. It is important to note, words that are considered typical in the U.S. might be considered jargon speech in India. For example, the phrase “nonverbal communication” is not commonly used in India, instead defining the term is much more appreciated (e.g., pointing, pulling of hands, etc.). Another factor that might have influenced the retention rate in India is associated with a power imbalance. In India, many of the parents refer to researchers or professionals as Sir/Madam irrespective of the age difference, creating a power imbalance. In order to decrease the imbalance in power, I requested the participants to call me by my first name. I facilitated the application of this request by sharing details about my life, which increased their comfort in calling me by my first name. While discussing the study, I requested parent’s opinions about the study, the importance of parenting in child development, as well as the need for such studies. These conversations with the parents helped in shifting power by increasing the importance of parents in the current research.

Challenges Due to COVID-19

The COVID-19 outbreak, and the associated restrictions significantly affected recruitment in South India. Although teletherapy was taking momentum, professionals reported difficulties in providing clinical services to children with MV-ASD using virtual platforms. For example, one of the professional who had reported working with more than 15 children with

MV-ASD and their families prior to COVID-19 outbreak shared that the center no longer worked with any children with MV-ASD. Similarly, parents of children with MV-ASD also reported limited confidence in teletherapy. Therefore, I received only a partial recruitment assistance from my large professional network as they held limited contact with parents of children with MV-ASD.

The disconnect between the professionals and ASD communities decreased the opportunities to connect with potential participants. Additionally, across both of the geographical locations, caregivers experienced additional daily stress from a variety of reasons unique to COVID-19 restrictions affecting their ability to participate. For example, mothers of children with ASD in India shared that they experienced an increase in their household demands from their partners and extended families, along with pressure from their professional lives. Specifically, many of the mothers reported having to juggle childcare, household chores, as well as maintaining their careers. Similarly, COVID-19 outbreak decreased access to childcare in the U.S., which affected parents' availability to participate in the study. Further, work-from-home policies decreased privacy and affected parents' ability to participate. Some of the mothers declined to participate because of the power dynamics often evident in many of the Indian families (Murthi & Hammell, 2021). For instance, a mother declined to participate because her husband denied permission for her to participate. In another instance, an interested mother was only able to take time to participate in the study after 11:00 PM Indian Standard Time. She completed all the house chores, including putting the child to sleep before participating. On the contrary, some of the participating mothers shared a positive outcome of the COVID-19 outbreak. Parents received a higher childcare support from their partners due to work-from-home conditions, which increased their ability to participate in the study.

Data Analysis

The IBM SPSS v.27 software for Windows OS was used to analyze the data. Data were analyzed to understand whole group variabilities (N =70) as well as group differences (South India and Midwestern U.S.). Descriptive analysis was performed to understand the data. Frequency and percentage were used to understand the categorical data distribution and mean and standard deviation for continuous variables. The data were screened for missing, outliers, and normality. The group distributions were assessed using the Mann-Whitney U-test. Spearman's Rho rank correlation test was used to develop a correlation matrix to assess the relationships between child and parent variables. The moderating influence of cultural orientation on the relationship shared between parenting stress and child communication skills was assessed using a hierarchical regression model with an interaction term. The *PS-T* scores and the cultural orientation scores from the *COS-SM* were centered before developing an interaction term to control for multicollinearity. Sensitivity analysis was performed to assess the effects of outliers on the correlational and regression analysis. All the data included to test the hypotheses were continuous variables, including the variables derived from *Vineland-III*, *PSI-4-SF*, and *COS-SM*. To better explain the findings of the current study, I used categorial variables. For example, *COS-SM* scores were used to examine the moderating effects of cultural orientation on the relationship between parenting stress and child communication abilities. When discussing the findings, I use the categorical classification to understand the current data.

Chapter 3: Results

The purpose of the current study was to understand the relationship between parenting stress, parents' cultural orientation, and child abilities. The roles and relationships between parenting stress, child abilities, as well as parents' cultural orientation were assessed within the large group that considered both parents from South India and Midwestern U.S. Further investigations were conducted to understand the differences between the two groups (South India and Midwestern U.S.) on the shared relationships between parenting stress, child abilities, and parent's cultural orientation. In the sections below, the findings from the statistical analysis that address the three main hypotheses using the parent and child variables are presented.

Group Distribution

Parent demographic details, factors that influence parenting (parent characteristics), child demographic details, and child developmental abilities were compared between the two geo-cultural groups using the Mann–Whitney U test. Details of the differences are further explained using descriptive statistical analyzes.

Parent Demographic Characteristics

The groups were compared on parent demographic variables that included age, gender, religion, highest education achieved, current employment, language backgrounds, and marital status. The two groups significantly differed from each other on employment status, U (N= 70) = 354.500, z = -3.273, p = .001, language backgrounds, U (N= 70) = 60.500, z = -6.668, p < .001, and religion, U (N= 70) = 1140.000, z = 6.672, p < .001. Most of the parents from the Midwestern U.S. (71%) held more full-time or part-time employment than parents from South India (20%). Most of the parents from South India spoke multiple languages (80%), whereas parents from the Midwestern U.S. were most often from monolingual backgrounds (63%). Most

of the parents from South India followed the Hindu religion (86%) whereas, parents from the Midwestern U.S. followed Christianity (74%). Only a few parents from both South India (5.7%) and the Midwestern U.S. (2.9%) identified with Muslim religion. Additionally, only a few parents across both groups recognized themselves with agnostic or atheist values (14%). Parents' age distribution was between 24 and 69 years (M = 36.37, SD = 6.47). The South Indian (M = 35.17; SD = 3.426) and Midwestern U.S. (M = 37.57; SD = 8.392) groups did not significantly differ from each other. In terms of education, most of the parents from South India (94%) and the Midwestern U.S. (94%) identified as mothers of children with MV-ASD (94%). Most of the parents from South India (94%) and Midwestern U.S. (91%) had at least held at a bachelor's degree (91%).

Parent Characteristics

Parent's quality of health, parenting stress, and cultural orientation scores were compared between the two groups. Parents self-rated their overall health quality, which included their mental, physical, and emotional well-being using a 5-point Likert scale. Most parents rated their health as "good" (46%), followed by "fair" (27%), "very good" (20%), "excellent" (5%), and then "poor" (2%). Parents' self-rating of their quality of health across the two groups did not significantly differ from each other.

Parenting stress measured with the use of the *PSI-SF-4* provided four scores that reflected parents' parental distress (PD), parent-child dysfunctional interaction (P-CDI), difficult child (DC), and total parenting stress (PS-T). The two groups of parents did not significantly differ on PD, P-CDI, or PS-T, but significantly differed on DC scores, U (N= 70) = 797.000, z = -2.172, p = .030. Parents in South India had a lower DC score with a mean of 82.37 (S.D. = 13.541) than

parents from the Midwestern U.S. who had a higher DC score with a mean of 87.69 (S.D. = 14.814).

Finally, the *COS-SM* measured cultural orientation in parents and generated two scores that reflected parents' first and second choices on the scenario-based assessment. The groups significantly differed both on their first, U (N= 70) = 884.000, z = 3.226, p = .001 and second choice, U (N= 70) = 412.00, z = -2.383, p = .017. The mean COS-SM score of parents from South India was closer to the *Collectivist* cultural values (M = 6.46, SD = 1.975) than parents from the Midwestern U.S. (M = 8.06, SD = 1.939). On their second choice, parents from South India identified more with *Individualist* culture (M = 8.26, SD = 1.755) than parents from the Midwestern U.S. (M = 7.03, SD = 2.203). While parents significantly differed on their first and second choices on the *COS-SM*, based on the cut-off scores, irrespective of the geographical location, the parents identified more with *Collectivist* than *Individualist* culture (73%).

Child Demographic Characteristics

The group distributions were also assessed using child variables. The two groups did not significantly differ on their demographic distributions in terms of age (M = 6.649; SD = 1.8), gender, birth order, age at diagnosis (M = 2.708; SD = .854), but significantly differed on their use of Speech Generating Devices (SGD), U (N= 70) = 927.500, z = -4.500, p < .001, and the number of language exposures, U (N= 70) = 77.500, z = -6.823, p < .001. While most children from the Midwestern U.S. (60%) used SGDs for communication, only a few children in South India reported using an SGD (9%). Most children from India were exposed to more than one language (97%); whereas most of the children from the Midwestern U.S. were monolingual (86%).

Comparisons were also made based on the education and intervention services the children received across the two groups. Specifically, intervention dosage in terms of weekly duration of speech and language, occupational, physical (physio) therapy, as well as the type of educational services the children received were compared between the groups. The groups differed on the type of educational services accessed by the children, U (N= 70) = 77.500, z = -6.823, p < .001. A majority of the children from the Midwestern U.S. attended public school (60%). Most of the children who did not receive public school education (20%, n = 14) received intensive Applied Behavioral Analysis (ABA) services instead (17%, n = 12). Although there was not a clear majority among the type of schooling attended by children in South India, one-third of the children did not attend any type of formal schooling or ABA services (34%). Children's age distribution was between 4 and 12 years (M = 6.48, SD = 1.709). The age distribution did not differ between the South Indian (M = 6.48, SD = 1.709) and the Midwestern U.S. (M = 6.811, SD = 1.902) groups.

Child Characteristics

The two groups of children were compared on their ASD screening and severity scores, as well as communication and developmental abilities. The two groups did not significantly differ from each other on their *SCQ* total scores (screening) and t-scores from the *SRS*-2 (severity). Developmental abilities were assessed using the *Vineland-III* domain and subdomain scores (see Table 4). The two groups significantly differed on their *Vineland-III* domain scores on their *Socialization*, U (N= 70) = 405.00, z = -2.442, p = .015, *Motor*, U (N= 67) = 336.500, z = -2.825, p = .005, and *Externalizing Maladaptive Behavior*, U (N= 70) = 870.00, z = 3.087, p = .002 scores. Children from South India had a higher mean score on *Socialization* (M = 55.03, SD = 9.106) than children from the Midwestern U.S. (M = 49.69 SD = 10.434). Similarly, children

from the Midwestern U.S. scored lower (*M* = 67.62, *SD* = 11.468) on the *Motor* sub-domain than children from South India (*M* = 74.00, *SD* = 9.367). *Externalizing Maladaptive Behaviors* scores were lower for children from South India (*M* = 16.83, *SD* = 1.992) than children from Midwestern U.S. (*M* = 18.23, *SD* = 1.437).

Table 5

Group Distribution of the Vineland-III scores – Mean and Standard Deviation

Domain and Subdomain Scores	Whole Group (N)		India (n)		U.S. (n)	
	M	*SD*	*M*	*SD*	*M*	*SD*
Communication Domain	40.4	14.427	41.97	15.766	38.83	12.99
Receptive	32.94	13.043	35.91	11.518	29.97	13.942
Expressive	22.09	8.862	22.2	8.888	21.97	8.966
Written	10.21	9.415	10.43	10.024	10	8.905
Daily Living Skills Domain	57.3	10.741	59.69	11.114	54.91	9.945
Personal	43.79	18.16	48.14	17.612	39.43	17.889
Domestic	5.01	5.887	6.26	6.541	3.77	4.911
Community	5.96	6.121	6.09	5.977	5.83	6.345
Socialization Domain	52.36	10.087	55.03	9.106	49.69	10.434
Intrapersonal	22.6	6.714	24.14	6.132	21.06	7
Play	16.81	7.703	18	4.814	15.63	9.714
Coping skills	13.84	6.335	14.74	5.153	12.94	7.296
Motor Skills Domain	70.76	10.892	74	9.367	67.62	11.468
Gross Motor	71.06	10.439	74.36	6.661	67.85	12.386
Fine Motor	32.9	9.573	35.21	10.274	30.65	8.388

Note. The scores are derived from the Vineland-III parent form for each child participant
N = 70; n = 35

The two groups of children were also compared on their sub-domain scores from the *Vineland-III*. The groups significantly differed on their *Receptive,* U (N= 70) = 443.00, z = -1.992, p = .046, *Interpersonal Relationship,* U (N= 70) = 424.50, z = -2.215, p = .027, *Play and*

Leisure, U (N= 70) = 355.00, z = -3.033, p = .002, and *Coping Mechanism*, U (N= 70) = 395.00, z = -2.566, p = .010 scores. Children from India on average scored higher on their *Receptive* (*M* = 35.91, SD 11.518), *Interpersonal Relationship* (*M* = 24.14, *SD* = 6.132), *Play and Leisure* (*M* = 18, SD 4.814), and *Coping Mechanism* (*M* = 14.74, *SD* = 5.153) scores. Children in the U.S. who scored lower on their *Receptive Language* (*M* = 29.97, *SD* =13.942), *Interpersonal Relationship* (*M* = 21.06, *SD* = 7.00), *Play and Leisure* (*M* = 15.63, *SD* = 9.714), and *Coping Mechanism* (*M* = 12.94, *SD* = 7.296) scores. The groups did not significantly differ on their *Expressive*, *Personal*, *Domestic*, *Community*, *Gross Motor*, and *Fine Motor* subdomain scores on the *Vineland-III*.

Communication abilities of the children across the two groups were also compared using the *Communication Matrix* scores. Although the groups did not differ on the total *Communication Matrix* as well as *BR* scores, the groups significantly differed on their JA scores, U (N= 70) = 353.500, z = -3.056, p = .002. Similar to the *Socialization* domain scores from the *Vineland-III*, children from the Midwestern U.S. scored lower on their *JA Communication Matrix* scores (*M* = 13.46, *SD* = 5.192) than children from South India (*M* = 16.03, *SD* = 3.761).

Co-Variates

A number of child and parent factors influence the level of parenting stress including child age, number of children along with parent age, education, employment, and their overall health. In this section I discuss the correlation between these child and parent demographic identities and parenting stress. Further, the moderating effects of these child and parent demographic identities on the relationship between parenting stress and child communication abilities are also discussed. As noted in Table 5, across all the child and parent demographic variables, only parent's education showed a statistically significant weak negative correlation

with parenting stress, r(70) = -.292, p = .014 (see Table 5). The co-variates including in the current study might exert a moderating effect on the shared relationship between parenting stress and child's communication skills; however, the analyses for examining these possibilities are beyond the scope of this study.

Table 5

Correlations between Co-variates and Parenting Stress

Co-variates	Parenting Stress
Number of children	.169
Child Age	.148
Parent Age	.156
Parent Education	-.292*
Parent Employment	.093
Total Language	-.175
Parent's Marital Status	-.009
Parents' Overall Health	.202

* $p < .05$; ** $p < .001$; N = 70

Hypothesis Testing

Three hypotheses that assessed the correlational and moderating roles of child and parent factors were tested for this study. Hypothesis 1 tested the correlation between child abilities. Hypothesis 2 tested correlation between parenting stress and child abilities. Finally, the third hypothesis tested the moderating role of parents' cultural orientation on parenting stress and child communication abilities. In the following subsections, I present the findings from statistical

analyses performed to test the three hypotheses. For the hypotheses 1 and 2, I discuss the whole group which includes participant data from South Indian and the Midwestern U.S., as well as South Indian and Midwestern U.S. group findings. When the results of the whole and those of individual groups did not differ from each other, I present findings from whole group alone with a mention of the similarity in the statistical finding in the subgroups (South India and the Midwestern U.S.).

Results from Hypothesis 1 Testing

Whole Group

The correlation between communication skills and externalizing maladaptive behaviors as measured by the *Vineland-III*, and ASD severity as measured by the *SRS*-2 t-scores in children with minimal verbal abilities was assessed. The two groups did not significantly differ the *Communication*, ASD severity, and *Externalizing Maladaptive Behavior* mean scores (see Table 6).

Table 6

Group Distributions of Child Abilities

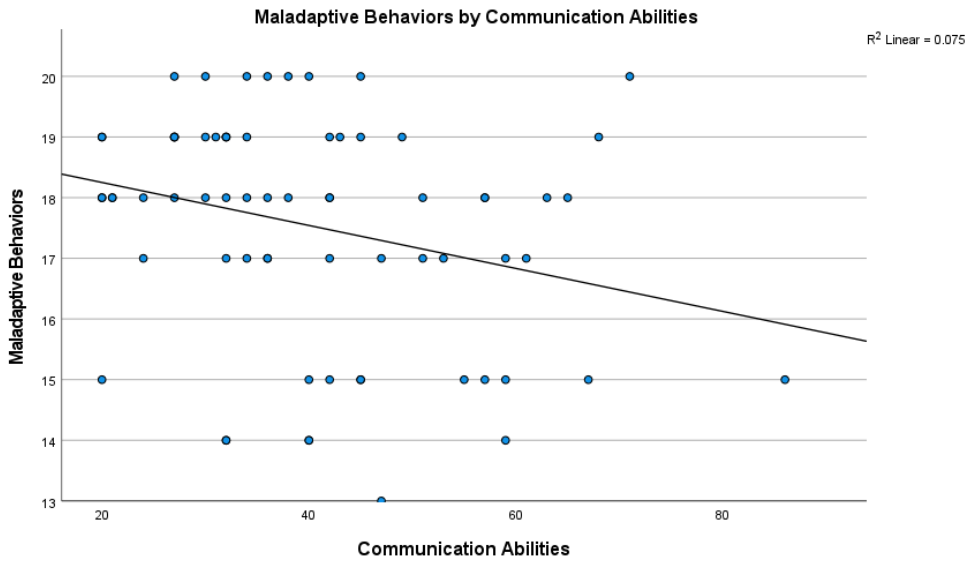
Child Abilities	Study Sample (N)		South India (n)		Midwestern U.S. (n)	
	M	*SD*	*M*	*SD*	*M*	*SD*
ASD Severity	81.81	8.01	80.31	7.415	83.31	8.401
Communication abilities	40.4	14.427	41.97	15.766	38.83	12.99
EMB[a]	17.53	1.863	16.83	1.992	16.83	1.992

Note. The mean and standard deviation of the scores from *SRS-2*, *Vineland-III Communication* domain scores, and *Vineland-III EMB v-Score*
[a]EMB - *Externalizing Maladaptive Behaviors*
N = 70; n = 35

The mean *SRS-2* scores across both groups showed that children had severe forms of ASD (*M* = 81.81, *SD* = 8.010), weak *Communication Abilities* (*M* = 40.40, *SD* = 14.427), and moderately high *Externalizing Maladaptive Behaviors* (*M* = 17.53, *SD* = 1.863). All three child variables in the total sample held a significant correlation with each other. According to the strength of correlation discussed by Dancey and Reidy (2007), the *Communication Abilities* and *Externalizing Maladaptive Behaviors* scores shared a weak negative correlation with each other, r(70) = -.289, p = .015. Figure 3 provides the sample distribution along with a fit line depicting the direction of correlation between *Communication Abilities* and the *Externalizing Maladaptive Behaviors* scores.

Figure 3

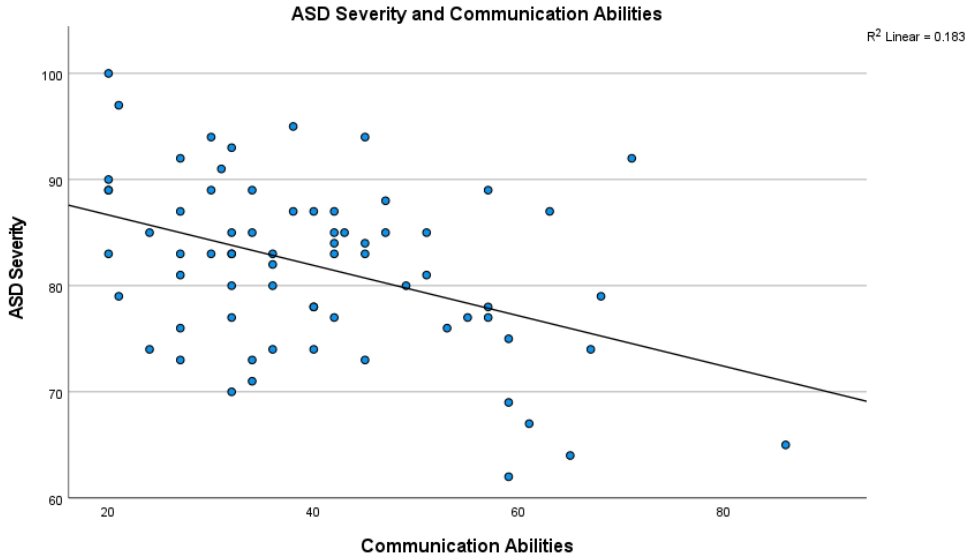
Correlation between Externalizing Maladaptive Behavior and Communication Abilities - Whole Groups



A weak negative correlation was noted between the *Communication Abilities* and *SRS-2* scores, r(70) = -.343, p = .004 (see Figure 4). Figure 4 provides the sample distribution along with a fit line depicting the direction of correlation between *Communication Abilities* and *SRS-2* scores.

Figure 4

Correlation between ASD Severity and Communication Abilities



Finally, a moderate positive correlation existed between the *Externalizing Maladaptive Behaviors* scores and ASD severity, r(70) = .447, p < .001 (see Table 7). Figure 5 provides the sample distribution along with a fit line depicting the direction of correlation between *Externalizing Maladaptive Behaviors* and *SRS-2* scores.

Figure 5

Correlation between ASD Severity and Externalizing Maladaptive Behavior

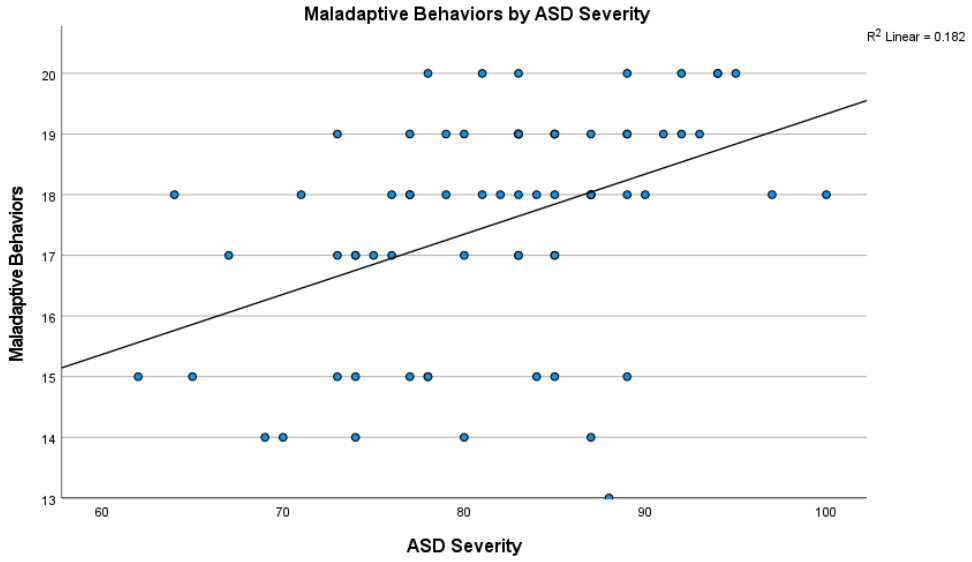


Table 7

Correlation Between Child Abilities – Whole Group

Study Sample (N)	M	SD	1	2	3
1. ASD Severity	81.81	8.01			
2. Communication abilities	40.4	14.427	-.343**		
3. EMB[a]	17.53	1.863	.447**	-.289*	

Note. The mean and standard deviation of the scores from *SRS-2*, *Vineland-III Communication* domain scores, and *Vineland-III EMB v-Score* for the whole group
[a]EMB - *Externalizing Maladaptive Behaviors*
* $p < .05$; ** $p < .001$; N = 70

South Indian Group

In the South Indian sample, the mean scores from *SRS-2* (*M* = 80.31, *SD* = 7.415), *Communication Abilities* (*M* = 41.97, *SD* = 15.766), and *Externalizing Maladaptive Behaviors* (*M* = 16.83, *SD* = 1.992) were similar to the total sample distribution (see Table 8). Unlike the total sample, the *Communication Abilities* and *Externalizing Maladaptive Behaviors* scores did not share a statistically significant correlation between each other (see Figure 6). The correlational analysis showed that the *Communication Abilities* and *SRS-2* scores share a weak negative correlation, r(35) = -.345, *p* = .043 (see Figure 7) and moderate positive correlation between *Externalizing Maladaptive Behaviors* and *SRS-2* scores, r(70) = .436, *p* = .009 (see Figure 8).

Table 8

Correlation Between Child Abilities – South Indian Group

South India (n = 35)	M	SD	1	2	3
1. ASD Severity	80.31	7.415			
2. Communication abilities	41.97	15.766	-.345*		
3. EMB	16.83	1.992	.436**	-0.27	

Note. The mean and standard deviation of the scores from *SRS-2*, *Vineland-III Communication* domain scores, and *Vineland-III EMB v-Score* for the South Indian group
EMB - Externalizing Maladaptive Behaviors
* $p < .05$; ** $p < .001$

Figure 6

Correlation between Externalizing Maladaptive Behavior and Communication Abilities – South Indian Group

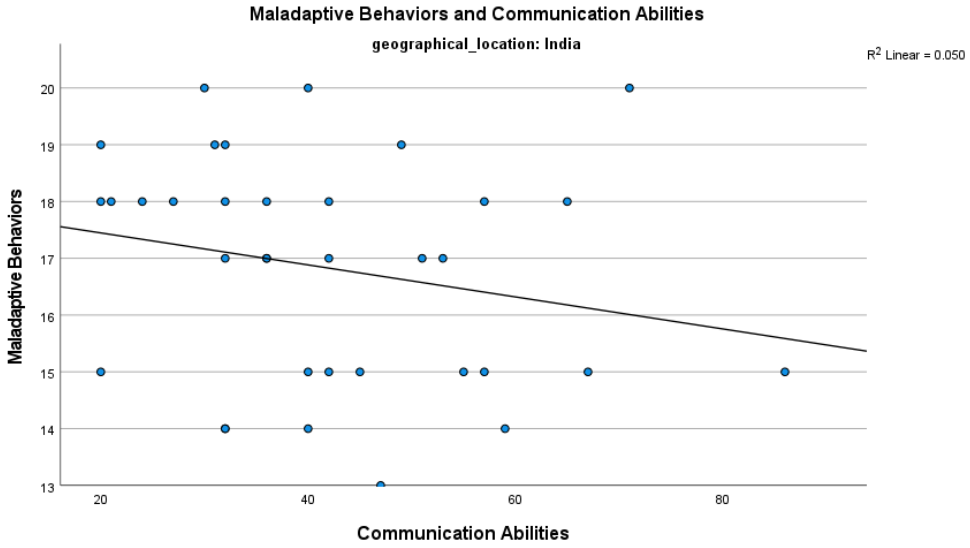


Figure 7

Correlation between ASD Severity and Communication Abilities – South Indian Group

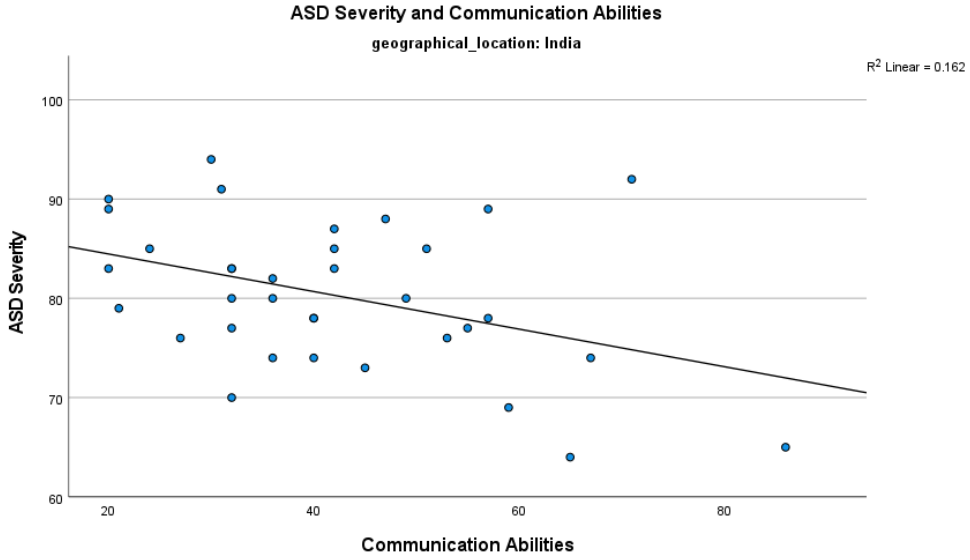
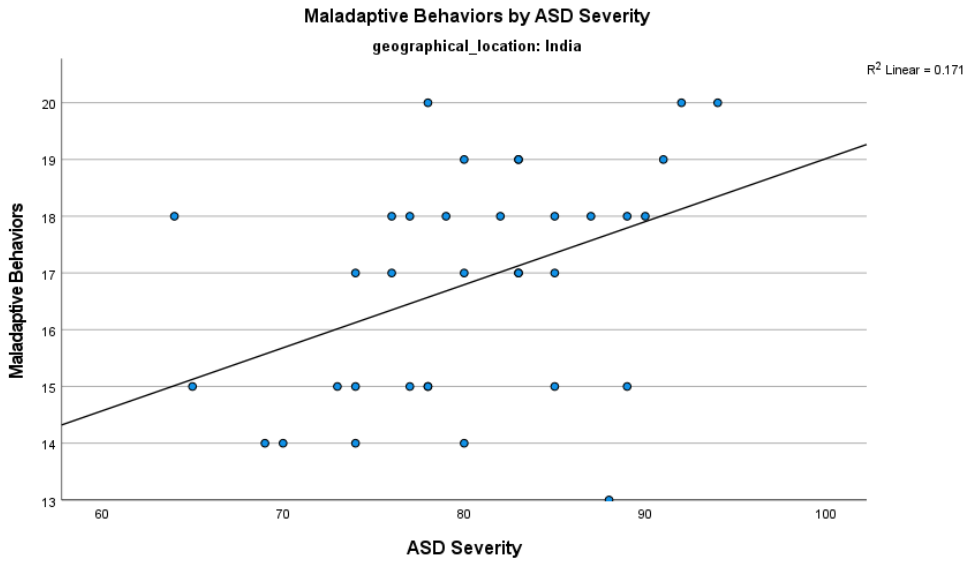


Figure 8

Correlation between ASD Severity and Externalizing Maladaptive Behavior – South Indian Group



Midwestern U.S. Group

In the Midwestern U.S. group, the average *SRS-2*ty (*M* = 83.31, *SD* = 8.401), *Communication Abilities* (*M* = 38.83, *SD* = 12.990), and *Externalizing Maladaptive Behaviors* (*M* = 16.83, *SD* = 1.992) were also similar to the total sample averages (See table 9). Unlike the total sample, but similar to the South Indian sample, the *Communication Abilities* and the *Externalizing Maladaptive Behaviors* scores did not share a statistically significant correlation between each other (see Figure 9). The correlational analysis showed that *Communication* and *SRS-2* scores share a weak negative correlation, r(35) = - .356, p =.036 (see Figure 10), and a weak positive correlation between *Externalizing Maladaptive Behaviors* scores and *SRS-2 scores*, r(70) = .370, p = .029 (see Figure 11).

Table 9

Correlation Between Child Abilities – Midwestern U.S. Group

Midwestern U.S. (n = 35)	M	SD	1	2	3
1. ASD severity	83.3	8.4			
2. Communication abilities	38.8	13	-.356*		
3. EMB[a]	16.8	1.99	.370*	-0.29	

Note. The mean and standard deviation of the scores from *SRS-2*, *Vineland-III Communication* domain scores, and *Vineland-III EMB v-Score* for the Midwestern U.S.group
[a]EMB - Externalizing Maladaptive Behaviors
* $p < .05$

Figure 9

Correlation between Externalizing Maladaptive Behavior and Communication Abilities – Midwestern U.S. Group

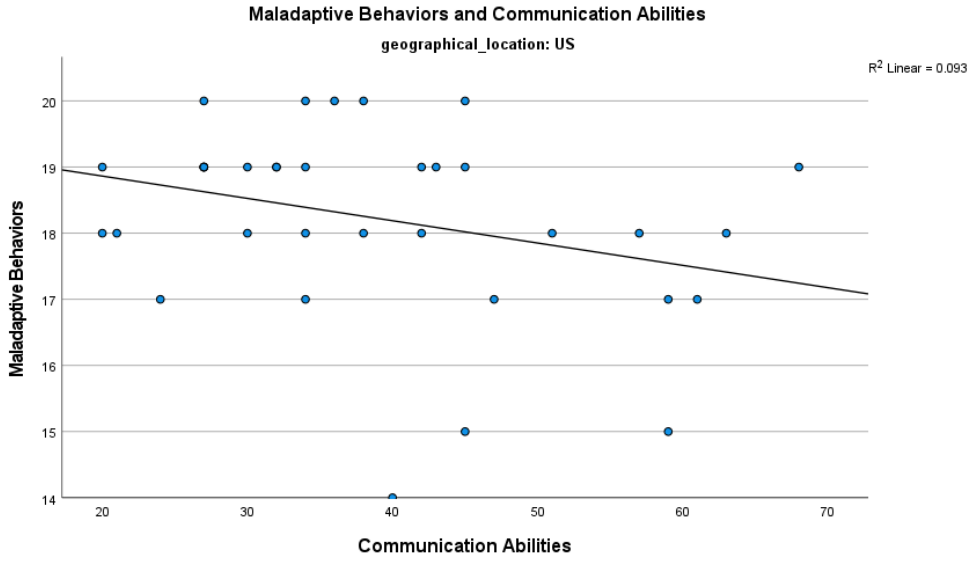


Figure 10

Correlation between ASD Severity and Communication Abilities – Midwestern U.S. Group

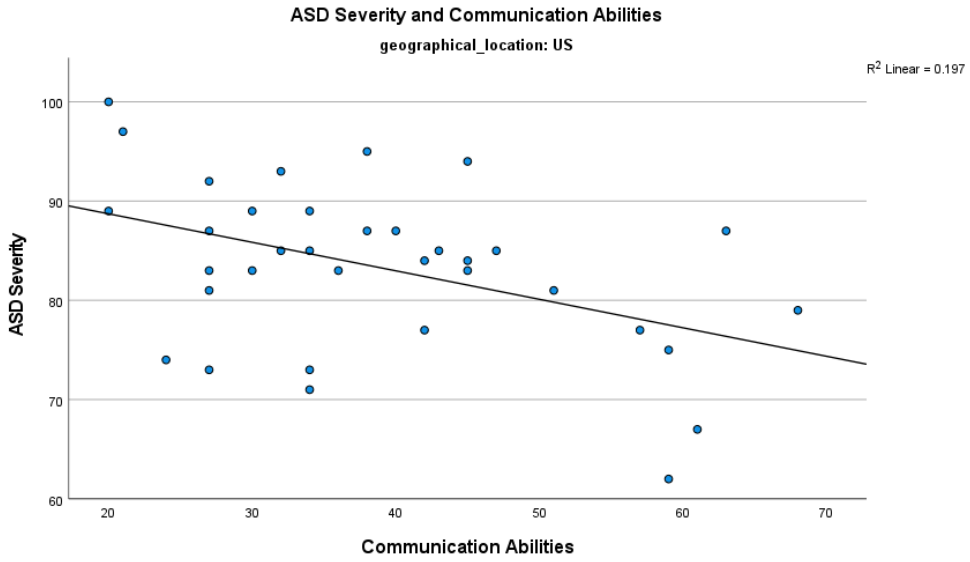
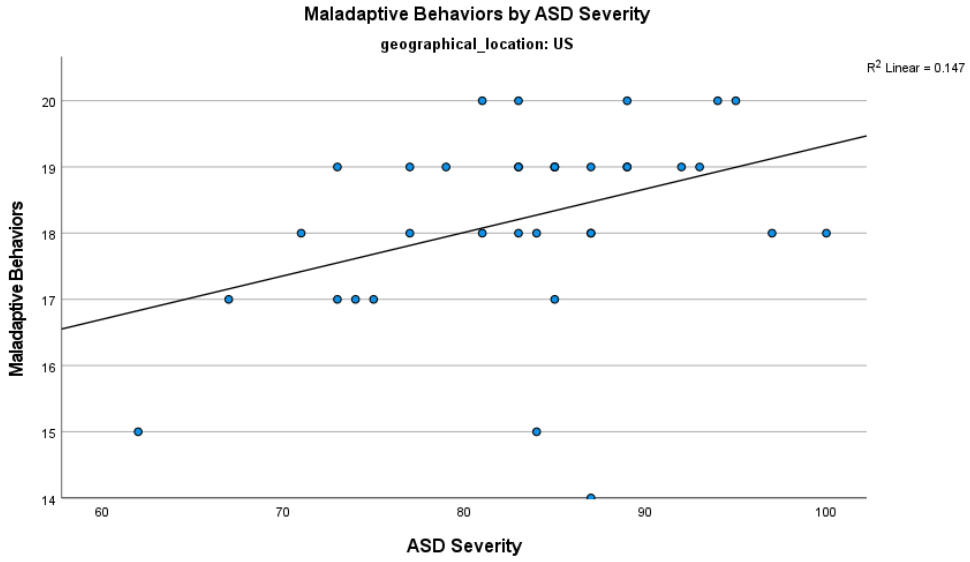


Figure 11

Correlation between ASD Severity and Externalizing Maladaptive Behavior – Midwestern U.S. Group



Results from Hypothesis 2 Testing

Whole Group

The relationship between parenting stress (*PS-T* score) as measured by *PSI-4-SF* and child abilities (*Communication, Daily Living, Socialization, Motor, Externalizing Maladaptive Behaviors* scores) as measured by the *Vineland-III* was assessed in the whole group sample. Spearman rho correlational analysis was conducted both on the whole sample, as well as within groups (see Table 10). The *PS-T* data had three outlying scores; therefore, a sensitivity analysis was performed, wherein the correlational analyses were carried out with and without the outliers to assess the effects of the outlying data points on the overall findings. Considering the correlational effects remained the same before and after the sensitivity analysis, the following findings reflect data, including the outlying values. The scatter plots shared below reflect data, which excludes the outlier values for better visual analysis of the correlational relationships. The strength of correlation was determined based on the Dancey and Reidy (2007) categorization for social sciences.

The correlation between the *PSI-4-SF* sub scores and child abilities are not reported as the pattern of the results echoed with *PS-T* scores and child abilities. In the whole sample, *PS-T* score shared a moderate negative correlation with *Communication*, $r(70) = -.550$, $p < .001$(see Figure 12), *Daily Living*, $r(70) = -.616$, $p < .001$ (see Figure 13), *Socialization*, $r(70) = -.614$, $p < .001$ (see Figure 14), and *Motor*, $r(67) = -605$, $p < .001$ scores (see Figure 15). On the other hand, the correlation between *PS-T* and *Externalizing Maladaptive Behaviors* scores showed a weak positive correlation, $r(70) =.496$, $p < .001$ (see Figure 16).

Table 10

Correlation statistics between Parenting Stress and Child Abilities

	M	*SD*	PS-T (N)	*M*	*SD*	PS-T – India (n)	*M*	*SD*	PS-T – U.S. (n)
Communication	40.4	14.4	-.550**	41.97	15.7	-.606**	38.8	12.9	-.465**
Daily Living	57.3	10.7	-.616**	59.6	11.1	-.643**	54.9	9.9	-.530**
Socialization	52.3	10.0	-.614**	55.03	9.1	-.461**	49.6	10.4	-.740**
Motor	67	70.7	-.605**	74	9.3	-.655**	67.6	11.4	-.441**
EMB[a]	17.5	1.8	.496**	16.8	1.9	.461**	18.2	1.4	.435**

Note. Mean and standard deviations of the domain scores from *Vineland-III* for whole group and subgroups – South India and the Midwestern U.S.
[a]EMB - *Externalizing Maladaptive Behaviors*
** $p < .001$; N = 70; n = 35

Figure 12

Correlation between Parenting Stress and Communication Abilities in Children – Whole Group

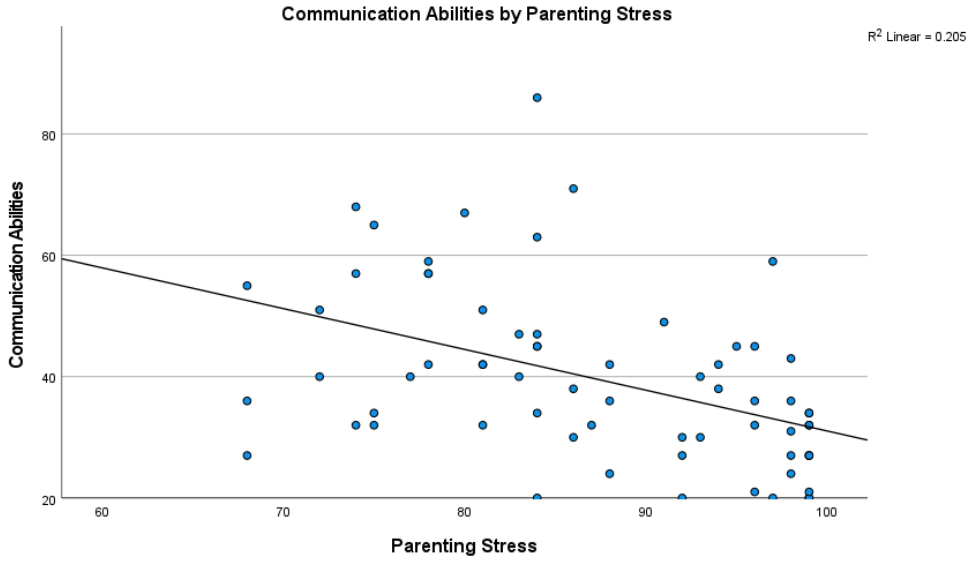


Figure 13

Correlation between Parenting Stress and Daily Living Skills in Children – Whole Group

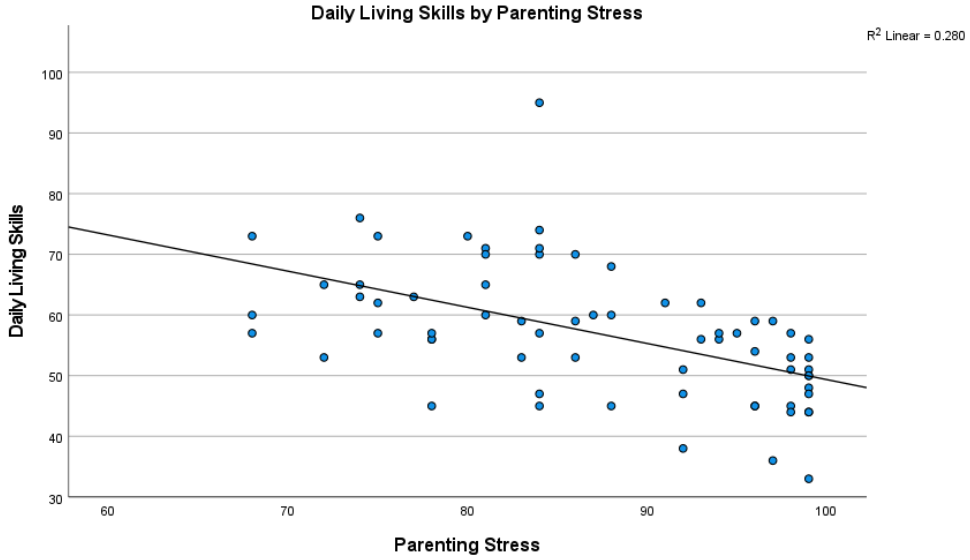


Figure 14

Correlation between Parenting Stress and Socialization Skills in Children – Whole Group

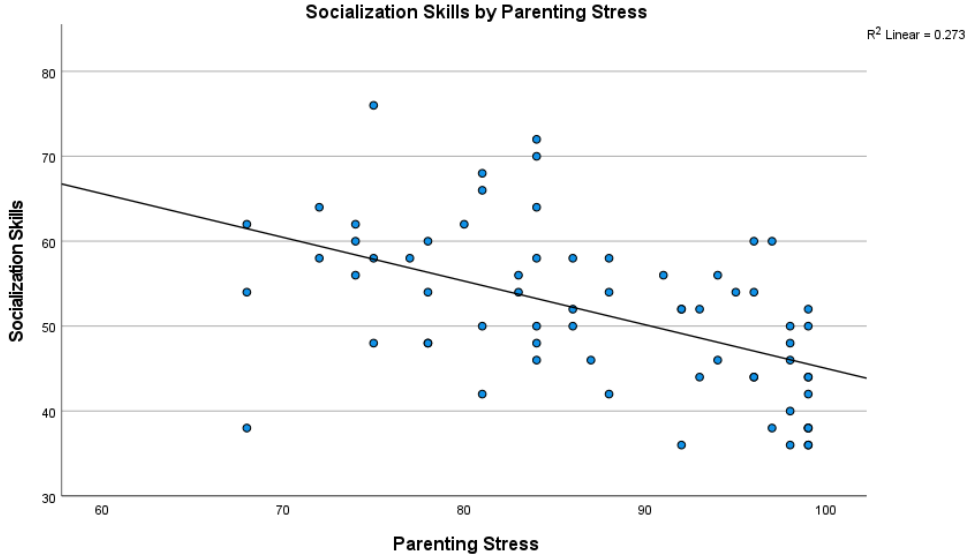


Figure 15

Correlation between Parenting Stress and Motor Skills in Children – Whole Group

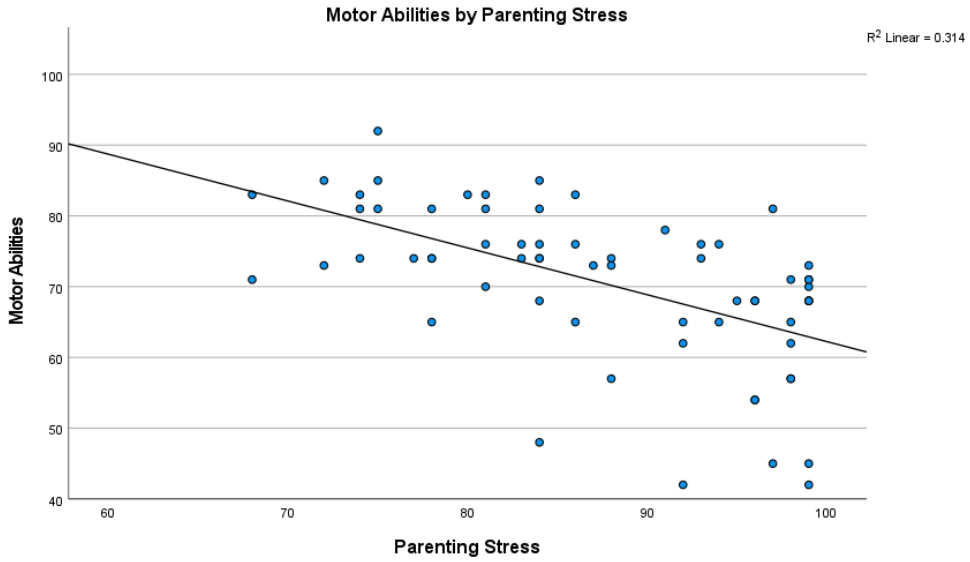
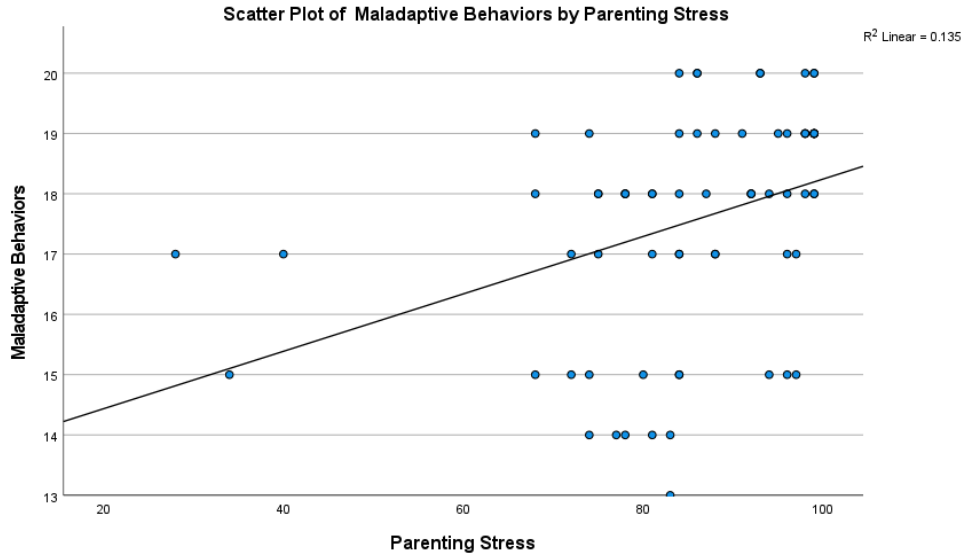


Figure 16

Correlation between Parenting Stress and Externalizing Maladaptive Behaviors in Children – Whole Group

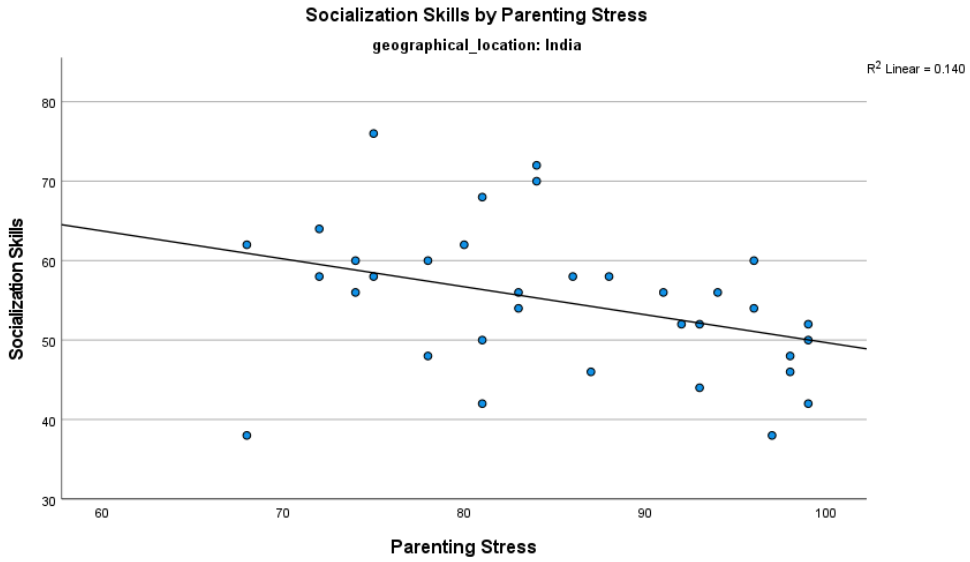


South Indian Group

In the sample from South India, *PS-T* scores shared a moderate negative correlation with *Communication*, r(35) = -.606, p < .001, *Daily Living*, r(35) = -.643, p < .001, and *Motor*, r(35) = -.655, p < .001 scores. Unlike the whole group findings, *PS-T* scores only shared a weak negative correlation with *Socialization* scores, r(35) = -.461, p < .001 (see Figure 17). On the other hand, *PS-T* scores shared a weak positive correlation with *Externalizing Maladaptive Behaviors* scores, r(35) = .461, p < .001.

Figure 17

Correlation between Parenting Stress and Socialization Skills in Children – South Indian Group

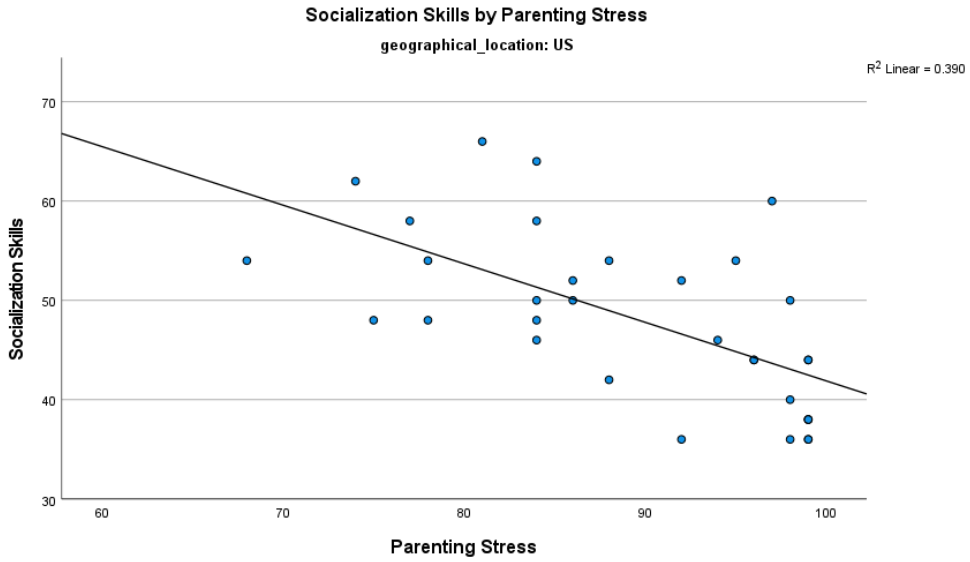


Midwestern U.S. Group

In Midwestern U.S. sample, *PS-T* score shared a strong negative correlation with *Socialization*, r(35) = -.740, p < .001 (see Figure 18), moderate negative correlation with *Daily Living*, r(35) = -.530, p < .001, weak negative correlation with *Communication*, r(35) = -.465, p < .001 and *Motor*, r(35) = -.441, p < .001 scores. On the other hand, *PS-T* score shared a weak positive correlation with *Externalizing Maladaptive Behaviors* scores, r(35) = .435, p < .001.

Figure 18

Correlation between Parenting Stress and Socialization Skills in Children – Midwestern U.S. Group



Results from Hypothesis 3 Testing

Whole Group

The moderating role of parent's cultural orientation on the relationship shared between child communication abilities and parenting stress was assessed. On average, the cultural orientation scores of the parents in the sample suggested that more identified with *Collectivist* cultural values than *Individualist* (M = 7.76, SD = 7.26). Across the participating parents, the level of parenting stress was on the higher end of the *PS-T* normal range (M = 84.96, SD = 14.391). On average, children in the current study had a weak *Communication* score based on the *Vineland-III* assessment (M = 40.40, SD = 14.427; see Table 11).

Table 11

Descriptive Statistics of Cultural Orientation, Parenting Stress, and Communication Skills – Whole Group

Variables	M	SD
Cultural Orientation (Individualist Scores)	7.26	2.104
Parenting Stress (PS-T)	84.96	14.391
Communication Skills (Vineland-III)	40.4	14.427

Note. Mean and standard deviation of the COS-SM, PSI-4-SF, and Communication Domain from Vineland-III across children from both geo-cultural groups – South India and Midwestern U.S.
N = 70

Regression analysis revealed that a significant amount of the variance in the communication abilities in children were explained by the *PS-T* and *COS-SM* scores, ($F(3, 65) = 8.317$, $p < .001$, $R^2 = .240$, R^2Adjusted = .204). Further analysis using the interaction term revealed that the *COS-SM* scores of the parents did not significantly (ns) predict communication abilities in children ($\beta = .214$, $t(66) = 2.035$, ns), nor did it significantly predict the relationship shared between parenting stress and child communication skills ($\beta = -.083$, $t(66) = -.714$, ns). Table 12 presents an overview of the multiple regression analysis with interaction term for *Communication* Domain Scores from the *Vineland-III*.

Table 12

Summary of the Multiple Regression Analysis with Interaction erm for Communication Domain Scores from the Vineland-III

Variables	B	*SD*	β	t	Sig
Parenting Stress (PS-T)	-.521	.116	-.520	-4.484	.000
Cultural Orientation (Individualist Scores PSIxIndiv[b])	1.468	.722	.214	2.035	.046
	-.037	.052	-.083	-.714	.478

[a]Dependent Variable: Communication Domain Scores; [b] Parenting Stress and Cultural Orientation Interaction term

Chapter 4: Discussion

Communication development relies on a variety of factors, both internal and external to a child (Deater-Deckard & Panneton, 2017). According to the socio-cultural theory of learning, mastering developmental skills requires coordination between motor, cognitive, social skills. Parent and the environment factors also critically contribute towards communication development in children (Curtiss, 2018). Similarly, supporting children with ASD requires addressing child needs as well as developing an understanding of the resources available to them through parents and the environment (Maenner et al., 2021). Considerable number of parent and environmental factors support child development; however, not all of these factors produce equivalent effects on the developmental trajectories. In terms of communication development, parenting stress and culture of the parents play a significant role in the quality and quantity of parent-child interactions (Lin et al., 2021). Similarly, cultural factors across personal, social, and physical domains influence child development (Halpin et al., 2019). While social and environmental domains are important, the latent measures of these factors are extremely difficult to quantify for the purpose of child development research; therefore, most studies consider individual traits as a proxy for measuring cultural variables (Schrøder, 2013). The role of child abilities and parenting stress, and to some extent the role of culture on child development are well documented in ASD literature; however, the evidence falls short when examining children with MV-ASD (Ilias et al., 2018; Suen et al., 2022). The current study examined associations between various child abilities, parenting stress, and parent's cultural orientation in children with MV-ASD.

In this chapter, I summarize the results from the three hypotheses testing, as well as discuss the demographic details of the participants for understanding the overall outcomes of the

study. The first hypothesis assessed the relationship between three child abilities: communication skills, externalizing maladaptive behaviors, and ASD severity. The second hypothesis studied the correlation between parenting stress and various child abilities (communication, daily living, socialization, motor skills, and maladaptive behaviors). Finally, the third hypothesis tested the moderating role of parent's cultural orientation on parenting stress and child's communication skills. Finally, I discuss the limitations associated with the study before presenting a section on conclusions and future directions.

Characteristics of the Participant Population

The study intentionally recruited parents of children with MV-ASD from two geo-cultural groups: South India and the Midwestern U.S. to access parents with potentially different cultural orientation. This section discusses the difference between the two participant groups in terms of parent and child characteristics. The two groups significantly differed on parents' employment status, language backgrounds, and religion. While many parents from the Midwestern U.S. were in part-time of full-time employment status, most of the parents from South India were homemakers. In many of the Indian cultures, external help with childrearing, such as day care or Nanny are socially undesirable affecting the prospect of receiving external childrearing supports (Shylasree et al., 2022). Given most of the participants were women, additional family expectations along with higher parenting demands might urge mothers to quit careers in the South Indian context (Scott, 2018). In the study sample, most of the parents from South India were multilingual with English as a common language across participants. On the contrary, most of the parents from the Midwestern U.S. identified with monolingual, with a few identifying with bilingual backgrounds. In terms of religion, many of the parents in the Midwestern U.S. identified with Christianity, whereas parents from South India mostly identified

with Hindu religion. Parent significantly differed on the cultural orientation scores. Resonating with the scientific literature, many of the parents from South India scored lower and parents from the Midwestern U.S. scored higher on the *Individualist* scale (Konsky et al., 2000).

Sampling differences between the groups were noted across a number of variables in terms of demographic identities and child variables. The number of children using SGDs to meet their daily communication needs was higher in the Midwestern U.S. than South Indian group. Similar to parents' linguistic backgrounds, most of the children from India were exposed to multiple languages, whereas most of the children from the Midwestern U.S. had monolingual exposures. Children from the Midwestern U.S. received public schooling at a higher percentage than children from South India. India has a limited number of inclusive and special schools, which restricts access to schooling for children with ASD and other disabilities (Dickinson, 2018). Several sampling differences were noticed in the *Vineland-III* scores. On an average, in the current sample, children with MV-ASD from South India had higher scores on *Socialization and Motor* domains as well as *Interpersonal Relationship, Play and Leisure, Coping Mechanism*, and *Receptive* subdomain scores than children from the Midwestern U.S. In addition, children from South India also had a higher *JA* scores on the *Communication Matrix* than children from the Midwestern U.S. The differences noted between the groups most likely emerges from sampling method used in the study: convenience and purposeful.

Aim 1: Examining the association between communication Skills, externalizing maladaptive behaviors, and ASD severity.

Evidence on the interrelations between various child abilities and their predictive nature towards latter communication development fluctuates between strong correlation and neutral relationships in the literature (Postorino et al., 2019). Understanding the nature of relationships

shared between child abilities provides practical knowledge required for designing supportive programs for child development (Lindsey et al., 2020; Trembath et al., 2020). For example, intervention programs that target maladaptive behaviors also facilitate communication development (Lobban-Shymko et al., 2017). While a number of individual abilities are critical for communication development, externalizing maladaptive behaviors and ASD severity consistently emerges as significant contributors to communication development in children with ASD (Lindsey et al., 2020).

In children with ASD, the presence of maladaptive behaviors affects quality of life both in children and their families (Lorang et al., 2021). Many of the intervention programs aiming to decrease maladaptive behaviors facilitate child development, including communication abilities (Severini et al., 2018; Yunus et al., 2021). The relationship between maladaptive behaviors and communication abilities are mixed in the literature, with many suggesting a negative correlation (Lobban-Shymko et al., 2017). Another factor that predicts communication growth is the ASD severity (Lindsey et al., 2020). Children that present severe forms of ASD symptoms often exhibit greater delays in communication skills than children with milder symptoms of ASD (Frazier et al., 2021). The two predictors of communication development: maladaptive behaviors and ASD severity share a positive relationship between each other. For instance, in many children with ASD, severe ASD symptom often correlates with the presence of severe maladaptive behaviors (Lindor et al., 2019).

In the current study, correlation between parent reported scores of *Communication* and *Externalizing Maladaptive Behaviors* from the *Vineland-III* and ASD severity as measured by the *SRS-2* was examined in children with MV-ASD. The correlation was analyzed for the whole group, which included both parent groups from South India and the Midwestern U.S. All three

variables: *Externalizing Maladaptive Behaviors, SRS-2,* and *Communication* scores, correlated with each other in the whole group analysis. The link between the child abilities in each of the groups slightly varied, with no significant correlation noticed between *Communication* and *Externalizing Maladaptive Behavior*s scores because of the smaller sample size. Even with the heterogeneity in *Communication* scores as documented on the *Vineland-III* (*M* = 40.40, *SD* = 14.427), the correlation between the three child abilities was evident. While the correlation between the three variables is mixed in the literature, in children with MV-ASD the relationship might be more consistent and straightforward. In other words, less heterogeneity in child abilities among the subgroup of children with ASD as compared to the ASD population might make the relationship more stable across children. Drawing a clinical inference, interventions that simultaneously target communication abilities, externalizing maladaptive behaviors, and address the core symptoms of ASD might better facilitate communication growth in children with MV-ASD than intervention that do not simultaneously address the three variables. While further research is required with larger sample sizes, even in children with MV-ASD, early behaviors associated with core symptoms, i.e., social communication and restrictive and repetitive behaviors along with maladaptive behaviors might potentially predict latter language or communication development (Brady et al., 2021).

Aim 2: Examining the relations between parenting stress and child abilities (*Communication, Daily Living, Socialization, Motor, Externalizing Maladaptive Behaviors* scores as measured by the *Vineland-III*).

Parents of children with ASD experience one of the highest levels of parenting stress when compared to parents of children with or without other disabilities, with potential secondary effects on child developmental trajectories (Madigan et al., 2019). Parents might experience

additional stress because of the verbal communication delay in children with MV-ASD. In the ASD literature, the relationship between parenting stress and child abilities mimics the mixed findings noted in correlational studies examining various child abilities (Clauser et al., 2021). In terms of the association with communication abilities, intervention studies that note a decrease in parenting stress also note an increase in communication skills in children with ASD (Giovagnoli et al., 2015). Parenting stress affects properties of parent-child interactions that influence communication development in children (Lin et al., 2021). For instance, parenting stress influences parent responsivity, temperament, involvement, and other parenting characteristics, which impels changes in childrearing practices and ultimately influences child daily living, socialization, and motor development (Miranda et al., 2019). Parents experiencing higher stress might have lower expectations from their children. Parent expectations sets demands that helps children achieve developmental competencies. Stated differently, low parenting expectations might result in delayed child development (Guo, 2015). Unlike the other child abilities, the bidirectional relationship between maladaptive behaviors and parenting stress are extremely well-documented (Madarevic et al., 2022). The relationship between parent and child behaviors provides key information required to address both child (direct) as well as parent (indirect) needs (Madigan et al., 2019).

The association between parenting stress and child abilities are well-documented among children who fit an average profile of those with ASD. Since children with MV-ASD fall below average on their communication abilities as compared to an average child with ASD, knowledge on the relationship between parenting stress and child abilities are lesser well-known. An updated understanding of the relationship between parenting stress and child abilities in MV-ASD is required for refining intervention programs. In the current study, total parenting stress as

measured by the *PSI-4-SF* correlated with child abilities as measured by the *Vineland-III*. The hypothesis was that parenting stress would correlate with all five of the child variables: *Communication, Daily Living, Socialization, Motor skills,* and *Externalizing Maladaptive Behavior* scores. The correlation was analyzed for whole group, which included parent groups from South India and the Midwestern U.S. As hypothesized, all five of the child abilities correlated with parenting stress scores. Parenting stress had negative relations with communication, daily living, socialization, and motor abilities of the children, and a positive relationship with externalizing maladaptive behaviors. When examining the relation between the parent and child variables in and across individual groups, difference was noted in the relationship shared between parenting stress and *Socialization* scores. In the South Indian group, the correlation was weak; but for the Midwestern U.S. group, the parenting stress held a strong correlation with *Socialization* scores.

While the sampling method used in the current study is the most likely explanation for the differences in the *Socialization* scores between the children across the two groups; thus, also explaining its relationship with parenting stress, multiple other explanations are also probable. One such possible explanation is associated with family structures across the two groups. Children in South India might have increased access to social interaction opportunities because of the family structure and cultural expectations around socialization which might help these children to acquire higher social skills as compared to their Midwestern U.S. counterparts (Raj & Raval, 2013; Lavi, 2022). Another potential explanation is that parents in the Midwestern U.S. might be more worried about their child's socialization skills than parents from South India resulting in higher stress because of lower socialization abilities in their children. High parent expectations and low child performance in terms of socialization skills in children might

contribute to greater parenting stress. Another reason for stronger correlation between parenting stress and child's *Socialization* score in the Midwestern U.S. group might relate to parent's social needs. Socialization culture practiced by adults considerably vary across the two cultures, specifically for women (Raval et al., 2013). While a mother in the Midwestern U.S. might not be judged for socializing with their friends, mothers of children with ASD or other disabilities in South India who socialize might be stigmatized (Legros & Cislaghi, 2020; Patra & Patro, 2019). The difference in social expectations and stigma, along with the stress from experiencing social isolation due to having a child with limited socialization skills, might impact parents differently across the two geo-cultural groups (Desai et al., 2012; Runco & Johnson, 2002; Singh et al., 2017). Because social expectations share a complex relationship with parenting stress and communication abilities in children, we need a future population-wide research to confirm the differences in child abilities across the two geo-cultural groups and then study the potential factors contributing the evident differences noted in the current sample.

Aim 3: Understand the moderating role of parents' cultural orientation in the relationship shared between parenting stress and child communication abilities.

The type, availability, and access to socio-cultural resources modify life experiences, including the quality of life in more ways than one. In developmental sciences, the socio-cultural resources influence child development through parenting and childrearing practices, where resources modify the parenting experiences and child outcomes (Chen et al., 2019). Knowledge about the influence of culture on child development assists scientists and service providers to design programs suitable for children with atypical development, including children with ASD, from diverse cultural communities with an intention to maximize child outcomes (Curtiss, 2018). On the contrary, limited knowledge decreases the ability of the scientific communities to

comprehend the interplay between culture and child development, which might compromise the effectiveness of intervention programs to meet the needs of children with ASD and their families from culturally diverse communities.

The influence of personal cultural traits of parents on screening and diagnosis are well documented in the ASD literature (Burkett et al., 2015; Ennis-Cole et al., 2013; Sarrett, 2015). For example, variability in symptom perceptions across cultures alters the identification of ASD which changes the course of diagnosis and treatment (Alonso Esteban et al., 2020). Contrastingly, the effects of culture on developmental trajectories in children with ASD are lesser well-known (Balboni et al., 2021). Typical development literature suggests that parents' cultural values shape their parenting practices and ultimately influence child development (Frewen et al., 2015). In the ASD literature, the relationship between cultural values, parenting stress, and child abilities is elusive but shows similar pathways as noted in the typical development literature (Yorke, 2016). When focusing on communication abilities in children with ASD, the role of culture and parenting stress is less clear. Much of the documented evidence of the shared relationship emerge from international research (research conducted outside the U.S.), rather than cross-cultural research. Research that works with more than one cultural group provides a unique perspective required for understanding the role of culture on child development.

The final aim of the current study examined the moderating role of culture on parenting stress and child communication abilities. Culture of the parents were assessed using the cultural orientation scale (*COS-SM*). Unlike the study's hypothesis, the *COS-SM* scores of the parents did not moderate the relationship shared between parenting stress and child communication abilities. A potential explanation for the lack of moderation effect from cultural orientation might be

explained based on the *COS-SM* scores of the parents across the two groups. While parents between the two groups significantly differed on their *COS-SM* scores, the different did not introduce a particle difference in parenting resources. We need more sensitive and appropriate measures of culture for understanding its role in child development.

Limitations

The study had limiting factors that affected the generalizability of the results. First, the study only recruited participants that spoke English, limiting the diversity among participants. The use of standardized assessments allowed recruitment of participants that spoke English. The use of purposeful, snowball, and convenience sampling in the study further reduces the generalizability of the results. Nonparametric characteristics of the data along with sampling methods, introduced a potential bias in samples across the two geo-cultural groups. The study only used a single measure of culture, which limited the ability to assess the complex interactions between culture, parenting stress, and child abilities. Additionally, the use of parent reported measures to assess child abilities reduced the efficacy of the study. While parent reported child abilities more accurately predict parenting stress than direct child measures, the ability to accurately assess the true relationship between parenting stress and child abilities also requires direct measures (Hutchison et al., 2016; Mackler et al., 2015). Limited number of participants in each of the two geo-cultural groups restricted the study's ability to detect small and medium effects when comparing the groups.

The study recruited participants during the COVID-19 global pandemic, which introduced additional challenges in recruitment and limited the ability to generalize the results of the study. For instance, decentralized health and education system in India restricted the ability to recruit participants from low-economic status, which further restricted the diversity in

participants (Panda & Thakur, 2016). Additionally, COVID-19 global pandemic also introduced additional burdens and challenges to parents which might have affected their parenting stress (Alhuzimi, 2021). Mothers in India shared that they experienced increased household responsibilities that stemmed from changes to their husband's work schedules (e.g., work-from-home policies). Government introduced restrictions, such as lockdowns resulting from COVID-19 global pandemic, also disrupted child services, such as in-person intervention services and childcare (Bharat et al., 2021; Sharma et al., 2021). While virtual mode of delivery was easily accessible in the U.S., most centers in India lacked training and knowledge on tele-therapy, which resulted in discontinuity of intervention services for children with MV-ASD (Sengupta et al., 2021; Singh et al., 2020).

Future Directions

This study reiterated the important role played by parenting stress on child abilities and alluded to its potential effects on the developmental trajectories in children with MV-ASD. Parent supportive programs that target parenting stress show positive outcomes both in terms of child development and parent well-being, yet the use and uptake of such programs are limited, especially for parents of children with ASD from culturally and linguistically diverse communities (Masiran et al., 2020). Similarly, parent-mediated interventions are known to introduce a dual positive effect on children as well as their parents, including a reduction in parenting stress, yet most of the parent-mediated intervention research has predominately worked with White, monolingual families in the West (Trembath et al., 2020). Future studies should assess factors that might facilitate implementation and use of parent-mediated intervention in parents of children with ASD, and more so for children with MV-ASD from culturally and linguistically diverse communities (DuBay et al., 2018). For example, school-based services

(through IDEA Part B) might be the only form of intervention services affordable to parents for their children with ASD from low resource settings (Bottema-Beutel et al., 2020). In such circumstances, parent education, training, or other forms of supportive services might not be readily accessible (Rios et al., 2021). In addition, parents from underserved (socio-economically, culturally, or linguistically diverse) communities are often excluded from or difficult to recruit for research, further limiting our understanding of the implementation factors that need consideration (Shaia et al., 2020). Critically, future research should identify factors affecting implementation and develop strategies in collaboration with established community-based services to implement evidence-based intervention to support children with MV-ASD and their families from underserved communities (Odom et al., 2022).

Future studies should also consider assessing other co-variates that might impact child abilities and/or parent behaviors (including parenting stress). Other studies that also focus on assessing the relationship between culture, parenting stress, and child abilities will benefit from including more sensitive measures of cultures. At present, very limited assessment materials exist that assess the cultural factors that influence child development. Increasing the number of research that view child development through a socio-cultural perspective will speak to the cultural factors that affect child development and help in constructing a measure for practical use when working with children from diverse cultural communities. Therefore, there is a need for simultaneous use of existing but a more sensitive measure of culture, as well as a need for developing new measures of culture in future studies with similar focus. Apart from cultural measures, we also need more studies that combine parent-reported measures as well as direct measures to understand the relationship between child abilities, parent behaviors, and culture. Direct measures provide an objective cross-reference to assess the accuracy of parent-reported

measures. Similarly, we need to also include other parent stressors to evaluate the overall well-being of parents and evaluate the factors that significantly affect their behaviors which shape learning environment for their children. For example, financial or marital stressors might introduce different effects on parent and child well-being than parenting stress (Harper et al., 2013).

Contextualizing an intervention to meet the needs of families from underserved communities also improves the sustained use of evidence-based practices (DuBay et al., 2018). When using interventions that require parent involvement, implementation science research must also understand parent ethnotheories that inform naturally used parent strategies to facilitate child learning (Putnam et al., 2018). Use of parent-child interactions as a means to measure parent strategies and behaviors paired with child responses is recommended by developmental science researchers. Specifically, parents from underserved communities might use diverse teaching-learning styles that might interfere with the implementation and sustained use of parent-mediated interventions (Lewis Ellison & Wang, 2018). For example, Lavi (2022) who worked with Nayaka tribe in South India noted the use of indirect learning methods by the adults to teach social skills in children, which deviated from many of the other cultures that use explicit and direct instructions to teach developmental skills (more likely in school-settings). While neither of the two teaching strategies: direct or indirect, are inferior, many of the intervention programs assume using one over the other produces differential outcomes in children (Brian et al., 2022). While modifying parent behaviors might help to optimize child outcomes, if other family members are not aligned with the proposed change in teaching-learning style, the uptake and sustainability of interventions might suffer (Lavi, 2022). Therefore, in my immediate future research, I will study parent-child interactions across diverse communities with a focus on

understanding teaching-learning styles and assess the association between child verbalization and parent speech and language input/output.

Conclusions

In 2022, a CDC report suggested that one in every 44 children had a diagnosis of ASD (Huang, 2016). This globally prevalent neurodevelopmental disorder affects daily functioning in children and extents the impact on family unit and the larger society (Constantino & Gruber, 2012). When addressing the needs of children with ASD, intervention services must also consider the needs of the family (Parker et al., 2020). Specifically, the interplay between child development, family characteristics, and environmental factors considerably shapes the developmental trajectories in children (Balboni et al., 2021). In terms of family characteristics, the role of parenting stress on child development is well documented (Suen et al., 2022). Scientific evidence consistently shows high correlation between parenting stress and child abilities in children with ASD (Rollins et al., 2019). Among the many factors, parenting stress is salient for child development, which might arise from parental concerns over the child's independence and future (Madigan et al., 2019). Age-appropriate mastery of communication skills is critical for leading a successful and independent life, and on the contrary, communication delay contributes to a lower quality of life (Junaidi et al., 2021). Parents of children with MV-ASD might experience high parenting stress resulting from significant delay in their child's verbal communication skills. The literature lacks depth and diversity in research that examines the relationship between parenting stress and child communication skills in children with MV-ASD. Further, a limited number of studies document the effects of culture on developmental abilities in children with MV-ASD. The few that do study the effect of culture on parenting stress and child abilities show a complex and convoluted relationship that lacks

practical use (Pecukonis et al., 2019). Future studies that examine the role of culture and parenting stress will help in designing and refining holistic intervention programs for optimizing developmental outcomes in children with MV-ASD from diverse cultural backgrounds.

The interest in scientific communities over the role of culture in ASD symptomology and prognosis has significantly increased over the last few decades. Contributing to the growing body of evidence, the current study examined the relationship between parents' cultural orientation, parenting stress, and child abilities. In the current study, results from testing hypotheses 1 and 2 was not surprising based on previous studies, but they extend the findings to another cultural group. Replicating the research, the results from the current study showed correlations between parenting stress and child abilities, such as communication, daily living, socialization, and motor skills. Additionally, parenting stress was also correlated with externalizing maladaptive behaviors. This cross-cultural study also highlighted differences in correlations between parenting stress and children's socialization skills between the two geo-cultural groups: South India and the Midwestern U.S. Specifically, the South Indian group held a weaker correlation as opposed to a stronger correlation noted among the Midwestern U.S. group between parenting stress and socialization skills in children with MV-ASD. Likely a result of the sampling method used in the current study, children in the South Indian group had a higher *Socialization* scores than those from the Midwestern U.S. Finally, the study failed to demonstrate a moderating role of parents' cultural orientation on the relationship shared between parenting stress and communication skills in children with MV-ASD.

While this study did not show a moderating effect of parents' cultural orientation on parenting stress and child abilities, future research should consider examining a more sensitive measure of culture. Hofstede's cultural dimensions might act as a point of reference for

identifying personal and group cultural variables for future cross-cultural studies (Hofstede, 1980). Additionally, home environment and resources in the environment are also associated factors critical to study the effects of culture on child abilities (Balboni et al., 2021). In addition, studies might also need to examine child abilities through direct child observations, in addition to parent reported measures (Hutchison et al., 2016; Romski et al., 2011). Including both direct and parent reported measures might provide additional information on the role of parents' perceptions on parenting stress. In addition, future research should also include other parent characteristics to study along with cultural variables, such as parenting styles, quality of parent-child interactions, parent temperament, emotional health, and psychological health, to draw accurate relationships between parent characteristics and developmental abilities in children with MV-ASD across diverse communities.

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Appendix A: Recruitment Email for India

Dear (Contact name),

I am Suma Suswaram, a Ph.D. candidate in the department of Speech-Language-Hearing: Sciences & Disorders at the University of Kansas, U.S.A. I am seeking for participants for my dissertation research study under the guidance of Dr. Nancy Brady. The focus of the study is to assess the parental stress and its effects on communication abilities in children with Autism Spectrum Disorders (ASD) that speak or sign less than 30 functional words.

In order to participate, the participants between age of 20-45 years must be a parent of a child with ASD between the age of 4 to 10 years.

After participation consent is received, the participants will participate in audio only interviews calls. Total duration for participation is estimated to be anywhere between up to 4 hours divided over 2 or 3 calls. Each participant will receive a participation compensation of Rs 730/- after the completion of the required interviews.

Participating in the study is completely voluntary and depends on the satisfaction of the study requirement. Additionally, participating in the study will provide valuable information regarding the importance of parent related behaviors on child's communication development required for future intervention and practice modification specific to Indian setting.

This study has been approved by the Institutional Review board (IRB) at the University of Kansas (KU). If you have additionally questions about your rights, you may contact the IRB at KU at (785) 864-7429 or (785) 864-7385 or write the Human Research Protection Program (HRPP), University of Kansas, 2385 Irving Hill Road, Lawrence, Kansas 66045-7568, or email irb@ku.edu.

Thank you for your time and consideration.

Sincerely,
Suma Suswaram
Principal Investigator
Speech-Language-Hearing: Sciences & Disorders
The University of Kansas, U.S.A.
Lawrence, KS 66045
suswaram_suma@ku.edu | (785) 331-8805

Appendix B: Recruitment Email for United States

Dear (Contact name),

I am Suma Suswaram, a Ph.D. candidate in the department of Speech-Language-Hearing: Sciences & Disorders at the University of Kansas. I am seeking participants for my dissertation research study under the guidance of Dr. Nancy Brady. The focus of the study is to assess the parental stress and its effects on communication abilities in children with Autism Spectrum Disorders (ASD) that speak or sign less than 30 functional words.

In order to participate, the participants between age of 20-45 years must be a parent of a child with ASD between the age of 4 to 10 years.

After participation consent is received, the parents will participate in audio only interviews calls. Total duration for participation is estimated to be anywhere between up to 4 hours divided over 2 or 3 calls. Each participant will receive a monetary compensation of $40 after the completion of the required interviews.

Participating in the study is completely voluntary and depends on the satisfaction of the study requirement. Additionally, participating in the study will provide valuable information regarding the importance of parent related behaviors on child's communication development required for future intervention and practice modification.

This study has been approved by the Institutional Review board (IRB) at the University of Kansas (KU). If you have additionally questions about your rights, you may contact the IRB at KU at (785) 864-7429 or (785) 864-7385 or write the Human Research Protection Program (HRPP), University of Kansas, 2385 Irving Hill Road, Lawrence, Kansas 66045-7568, or email irb@ku.edu.

Thank you for your time and consideration.

Sincerely,

Suma Suswaram
Principal Investigator
Speech-Language-Hearing: Sciences & Disorders
The University of Kansas, U.S.A.
Lawrence, KS 66045
suswaram_suma@ku.edu | (785) 331-8805

Appendix C: Consent Form for Participants from India

KEY INFORMATION

- This research study is examining the effect of parenting stress on communication skills in children, while comparing the participants from India and the United States.
- Your participation in this research project is completely voluntary.
- Your participation will take anywhere up to 4 hour.
- You will be asked to *answer standardized questions related to parenting stress and communication abilities of your child.* More detailed information on the procedures can be found below.
- There are no anticipated risks or harms associated with participation in this study beyond those of everyday life.
- You will not receive any direct benefit from this study. However, your participation in the study will advancing the knowledge on the effects of parenting stress on communication abilities in children.
- You will receive a monetary compensation for your participation of 730/- Rs.
- Your alternative to participating in this research study is not to participate.

DETAILED INFORMATION

INTRODUCTION

The Department of Speech-Language-Hearing at the University of Kansas, United States, supports the practice of protection for human subjects participating in research. The following information is provided for you to decide whether you wish to participate in the present study. You may refuse to sign this form and not participate in this study. You should be aware that even if you agree to participate, you are free to withdraw at any time. If you do withdraw from this study, it will not affect your relationship with this unit, the services it may provide to you, or the University of Kansas.

PURPOSE OF THE STUDY

This is an audio interview to explore the effects of parental stress on the communication skills in children.

PROCEDURES

After receiving this written consent, an interviewer will obtain your demographic information to determine whether you qualify to participate. Demographic items request details regarding your child and as well as your demographic details such as age, gender, race, ethnicity, religion, etc. Inclusion criteria for required for participants includes your child's communication, hearing, visual abilities, child's age must be between the age of 4 to 10 years and speak or sign less than 30 functional words. Additionally, your current age must be between 20-45 years. If you meet the inclusion criteria, the interviewer will provide an overview of the study and obtain verbal consent. Your participation will include participating in Zoom interview estimated to be 4 hours long. Break down on the commitment by activity, duration and frequency of calls are provided below (see table1). The interviewer will utilize standardized assessment for assess stress and your child's communication abilities. The interviewer will audio-recorded the interview. The information from the interview will not be attached to your name or any other direct identifiers. You can request the

audio recording to stop at any time during the interview. However, if the interview is not audio recorded the study will not include you as a participant. The audio recording will be used to score the respective assessments by the research team members, that is Suma Suswaram. All the recordings and notes will be stored in a secure encrypted location on the server with data accessibility to IRB approved research team members. All recordings and notes of the interview will be deidentified from your demographic information by storing the identifiable information (e.g., informed consent forms) separate from recordings and notes. Your response, audio-recording and the notes will be saved under an unidentifiable alpha code and/or participant number. All data will be stored on secure, dedicated and encrypted servers. Data will be stored indefinitely for the purpose of further data analysis. In the case that data analysis has ended, all audio-recordings will be destroyed after 5 years using secure methods. You may withdraw from research at any time without any negative repercussions. As soon as a you indicate you would like to withdraw from the study, all study activities will end.

Table 1. *Time commitment*

Interview type	**Activity**	**Anticipated Duration**
First Contact/Interview	Verbal Consent, Demographic Information Interview, and Screening	30-45 minutes
Second Interview	Parent reported Child's Communication abilities measures	1-2 hours
Third Interview	Parenting stress, cultural orientation, and socio-economic Status measures	30- 45 minutes

RISKS

There are no anticipated risks or harms associated with participation in this study beyond those of everyday life.

BENEFITS

You will not receive any direct benefit from this study. However, your participation in the study will advancing the knowledge on the effects of parenting stress on communication abilities in children.

PAYMENT TO PARTICIPANTS

You will receive 730/- Rs after your participation in the study. Unfortunately, if you choose to terminate your participation before you compete the study requirement, you will not be eligible to receive the participation compensation. Additionally, if you do not meet the eligibility criteria you will be withdrawn from the study and will not receive compensation.

You can choose not to answer any of the personal demographic questions, and still be considered for completed participation payment. However, if you choose to not answer any of the standardized assessment questions, (i.e., child communication, stress level, cultural orientation, and socio-economic status) you will be withdrawn from the study and will not receive compensation.

PARTICIPANT CONFIDENTIALITY

Your name will not be associated in any publication or presentation with the information collected about you or with the research findings from this study. Instead, the researcher(s) will use a study

number or a pseudonym rather than your name. Your identifiable information will not be shared unless (a) it is required by law or university policy, or (b) you give written permission.
Permission granted on this date to use and disclose your information remains in effect indefinitely. By signing this form, you give permission for the use and disclosure of your information for purposes of this study at any time in the future.

PRIVATE INFORMATION (DATA) AND/OR BIOSPECIMENS
Your identifiable information may be removed from the data collected during the interview, and the de-identified data will be used for future research without additional consent from you.
Your identifiable information will not be used or distributed for future research studies even if your identifiable information is removed.

REFUSAL TO SIGN CONSENT AND AUTHORIZATION
You are not required to sign this Consent and Authorization form and you may refuse to do so without affecting your right to any services you are receiving or may receive from the University of Kansas or to participate in any programs or events of the University of Kansas. However, if you refuse to sign, you cannot participate in this study.

CANCELLING THIS CONSENT AND AUTHORIZATION
You may withdraw your consent to participate in this study at any time. You also have the right to cancel your permission to use and disclose further information collected about you, in writing, at any time, by sending your written request to:

Suma Suswaram
Principal Investigator
Speech-Language-Hearing: Sciences & Disorders
The University of Kansas, U.S.A.
Lawrence, KS 66045
suswaram_suma@ku.edu | (785) 331-8805

Nancy Brady
Faculty Advisor
Speech-Language-Hearing: Sciences & Disorders
The University of Kansas, U.S.A.
Lawrence, KS 66045
nbrady@ku.edu | (785) 864-0762

If you cancel permission to use your information, the researchers will stop collecting additional information about you. However, the research team may use and disclose information that was gathered before they received your cancellation, as described above.

QUESTIONS ABOUT PARTICIPATION
Questions about procedures should be directed to the researcher(s) listed at the end of this consent form.

PARTICIPANT CERTIFICATION:
I have read this Consent and Authorization form. I have had the opportunity to ask, and I have received answers to, any questions I had regarding the study. I understand that if I have any additional questions about my rights as a research participant, I may call (785) 864-7429 or (785) 864-7385, write the Human Research Protection Program (HRPP), University of Kansas, 2385 Irving Hill Road, Lawrence, Kansas 66045-7568, or email irb@ku.edu.

I agree to take part in this study as a research participant. By my signature I affirm that I am at least 18 years old and that I have received a copy of this Consent and Authorization form.

_____ _____

Type your Name Today's Date

_____

Signature (type or sign you name)

My preferred mode of contact (required*):

Phone Number (mobile)*: Email ID*:

Appendix D: Consent Form for Participants from United States

KEY INFORMATION

- This research study is examining the effect of parenting stress on communication skills in children, while comparing the participants from India and the United States.
- Your participation in this research project is completely voluntary.
- Your participation will take anywhere up to 4 hour.
- You will be asked to *answer standardized questions related to parenting stress and communication abilities of your child.* More detailed information on the procedures can be found below.
- There are no anticipated risks or harms associated with participation in this study beyond those of everyday life.
- You will not receive any direct benefit from this study. However, your participation in the study will advancing the knowledge on the effects of parenting stress on communication abilities in children.
- You will receive a monetary compensation for your participation of $40.
- Your alternative to participating in this research study is not to participate.

DETAILED INFORMATION

INTRODUCTION

The Department of Speech-Language-Hearing at the University of Kansas supports the practice of protection for human subjects participating in research. The following information is provided for you to decide whether you wish to participate in the present study. You may refuse to sign this form and not participate in this study. You should be aware that even if you agree to participate, you are free to withdraw at any time. If you do withdraw from this study, it will not affect your relationship with this unit, the services it may provide to you, or the University of Kansas.

PURPOSE OF THE STUDY

This is an audio interview to explore the effects of parental stress and parenting styles on the communication skills in children.

PROCEDURES

After receiving this written consent, an interviewer will obtain your demographic information to determine whether you qualify to participate. Demographic items request details regarding your child and as well as your demographic details such as age, gender, race, ethnicity, religion, etc. Inclusion criteria for required for participants includes your child's communication, hearing, visual abilities, child's age must be between the age of 4 to 10 years and speak or sign less than 30 functional words. Additionally, your current age must be between 20-45 years. If you meet the inclusion criteria, the interviewer will provide an overview of the study and obtain verbal consent. Your participation will include participating in Zoom interview estimated to be 4 hours long. Break down on the commitment by activity, duration and frequency of calls are provided below (see table1). The interviewer will utilize standardized assessment for assess stress and parental styles, and your child's communication abilities. The interviewer will audio-recorded the interview. The information from the interview will not be attached to your name or any other direct identifiers. You can request the audio recording to stop at any time during the interview. However, if the

interview is not audio recorded the study will not include you as a participant. The audio recording will be used to score the respective assessments by the research team members, that is Suma Suswaram. All the recordings and notes will be stored in a secure encrypted location on the server with data accessibility to IRB approved research team members. All recordings and notes of the interview will be deidentified from your demographic information by storing the identifiable information (e.g., informed consent forms) separate from recordings and notes. Your response, audio-recording and the notes will be saved under an unidentifiable alpha code and/or participant number. All data will be stored on secure, dedicated and encrypted servers. Data will be stored indefinitely for the purpose of further data analysis. In the case that data analysis has ended, all audio-recordings will be destroyed after 5 years using secure methods. You may withdraw from research at any time without any negative repercussions. As soon as a you indicate you would like to withdraw from the study, all study activities will end.

Table1. *Time commitment*

Number of Interview(s)	Activity	Anticipated Duration
First Contact/Interview	Demographic Information Interview and Screening	30-45 minutes
Second Interview	Parent reported Child's Communication abilities measures	1-2 hours
Third Interview	Parent measures (stress and styles) and measure of Socio-economic Status.	30- 45 minutes

RISKS

There are no anticipated risks or harms associated with participation in this study beyond those of everyday life.

BENEFITS

You will not receive any direct benefit from this study. However, your participation in the study will advancing the knowledge on the effects of parenting stress on communication abilities in children.

PAYMENT TO PARTICIPANTS

You will receive $40 after your participation in the study. Unfortunately, if you choose to terminate your participation before the competition of the study, you will not be eligible to receive the participation compensation. Additionally, if you do not meet the eligibility criteria you will be withdrawn from the study and will not receive compensation.

You can choose not to answer any of the personal demographic questions, and still be considered for completed participation payment. However, if you choose to not answer any of the standardized assessment questions, (i.e., child communication, stress level, cultural orientation, and socio-economic status) you will be withdrawn from the study and will not receive compensation.

Investigators may ask for your social security number in order to comply with federal and state tax and accounting regulations.

PARTICIPANT CONFIDENTIALITY

Your name will not be associated in any publication or presentation with the information collected about you or with the research findings from this study. Instead, the researcher(s) will use a study number or a pseudonym rather than your name. Your identifiable information will not be shared unless (a) it is required by law or university policy, or (b) you give written permission.
Permission granted on this date to use and disclose your information remains in effect indefinitely. By signing this form, you give permission for the use and disclosure of your information for purposes of this study at any time in the future.

PRIVATE INFORMATION (DATA) AND/OR BIOSPECIMENS
Your identifiable information may be removed from the data collected during the interview, and the de-identified data will be used for future research without additional consent from you.
Your identifiable information will not be used or distributed for future research studies even if your identifiable information is removed.

REFUSAL TO SIGN CONSENT AND AUTHORIZATION
You are not required to sign this Consent and Authorization form and you may refuse to do so without affecting your right to any services you are receiving or may receive from the University of Kansas or to participate in any programs or events of the University of Kansas. However, if you refuse to sign, you cannot participate in this study.

CANCELLING THIS CONSENT AND AUTHORIZATION
You may withdraw your consent to participate in this study at any time. You also have the right to cancel your permission to use and disclose further information collected about you, in writing, at any time, by sending your written request to:

Suma Suswaram
Principal Investigator
Speech-Language-Hearing: Sciences & Disorders
The University of Kansas, U.S.A.
Lawrence, KS 66045
suswaram_suma@ku.edu | (785) 331-8805

Nancy Brady
Faculty Advisor
Speech-Language-Hearing: Sciences & Disorders
The University of Kansas, U.S.A.
Lawrence, KS 66045
nbrady@ku.edu | (785) 864-0762

If you cancel permission to use your information, the researchers will stop collecting additional information about you. However, the research team may use and disclose information that was gathered before they received your cancellation, as described above.

QUESTIONS ABOUT PARTICIPATION
Questions about procedures should be directed to the researcher(s) listed at the end of this consent form.

PARTICIPANT CERTIFICATION:
I have read this Consent and Authorization form. I have had the opportunity to ask, and I have received answers to, any questions I had regarding the study. I understand that if I have any additional questions about my rights as a research participant, I may call (785) 864-7429 or (785)

864-7385, write the Human Research Protection Program (HRPP), University of Kansas, 2385 Irving Hill Road, Lawrence, Kansas 66045-7568, or email irb@ku.edu.

I agree to take part in this study as a research participant. By my signature I affirm that I am at least 18 years old and that I have received a copy of this Consent and Authorization form.

_____ _____

Type your Name Today's Date

_____

Signature (type or sign you name)

My preferred mode of contact (required*):

Phone Number (mobile)*: Email ID*:

Appendix E: Parent Interview Questionnaire
Developed based on Desai et al. (2012) and Sarrett (2014) and personal experiences as an SLP in India

Date
Interviewer (Name):
Translator (if used):
Location (geographic location): India/U.S.
State of Residence

Child Related demographics

1. Date of birth:
2. Sex Assigned at birth:
3. Birth order:
    a. Youngest
    b. Middle
    c. Oldest
    d. Only child
4. Additional children:
    a. Number:
    b. Sibling diagnosis or developmental diabilies
        i. Yes, Medical status/Physical status/Psychological status
        ii. No
5. Abilities:
    a. Hearing
    b. Vision
    c. Verbal
        i. How many words can you child say independently to communicate (without prompts: verbal or none-verbal)?
        ii. What is the child's typical mode of communication? verbally, sign, SGD, PECS
6. Diagnosis (if applicable):
    a. Type of diagnosis: Clinical/Educational/Medical
    b. Age at diagnosis:
7. Child's education
    a. Mainstream or Regular School (e.g., public or private school)
    b. Specialized classes within a mainstream school setting
    c. Special School (0% inclusion into mainstream education)
    d. Does not attend school
8. Child's access to intervention (access, frequency/week, home/school)
    a. Speech therapy
    b. Occupational therapy
    c. Physiotherapy
    d. Others _____
9. Primary caretaker of the child with MV-ASD:
    a. Meeting daily needs of the child (child rearing):
    b. Financial support only
10. How many language is your child exposed to?

   a. Name:
   b. What settings is your child exposed to these language?
   c. What language does your child receive speech language pathology interventions?

11. How many member live with you and your child:

Primary Caregiver

1. What is your age?

2. Please indicate your biological sex (the sex that was assigned to you at birth):
   a. Male
   b. Female
3. Please indicate your race (check all that apply):
   a. White/Caucasian
   b. Black/African American
   c. Asian
   d. Hispanic or Latino
   e. Native American or American Indian
   f. Pacific Islander
   g. Other (please specify) _____
4. What is your highest education?
   a. No schooling
   b. Primary or elementary school
   c. Middle school (6^{th} to 8^{th} Grade)
   d. High school (9^{th} to 12^{th} Grade)
   e. Trade/technical/Vocational training
   f. Diploma
   g. College – Undergraduate
   h. College – Graduate (Master's)
   i. College – Undergraduate (Ph.D.)
5. What is your current employment status?
   a. Actively working
   b. Self-employed
   c. Student
   d. Homemaker/stay at home
   e. Military
   f. Unemployed
      i. Reason:
6. What religion do you identify yourself with?
   a. Hindu
   b. Christianity
   c. Jain
   d. Muslim
   e. Others:
7. Spoken languages abilities?
   a. Primary Language:
   b. Number:
   c. Names:

Kannada/Tamil/Telugu/Malayalam/Hindi/English/Spanish/German/Vietnamese/French

   d. How fluent are you in English? (for participants with English as their second language)
      i. Use it in official capacity (speaking/writing)
      ii. Use it in unofficial capacity – conversation level
      iii. Use it occasionally for practical use, but never with my child
      iv. Use it occasionally for practical use, including with my child
      v. Comprehend only
      vi. Novice (not much practical use)

8. Parents marriages status:
   a. Single
   b. Married
   c. Divorce
   d. Domestic partners
   e. Widowed
   f. Other:
9. How is your overall general health?
   a. Excellent
   b. Very good
   c. Good
   d. Fair
   e. Poor

Appendix F: Scenario-Based Cultural Orientation Measure by Triandis et al. (1998)

Key: C – Collectivist | I – Individualist

Participant Instruction: I am going to present you with 16-scenarios followed by four options. Please imagine yourself in those situations and rank your top two options. The option that you consider the best, or the most "right" or "appropriate for you" receives the highest rank. The next best option receives the second rank. Remember there are no "correct" answers, just opinions of what is best for you.

1. You and your friends decided spontaneously to go out to dinner at a restaurant. What do you think is the best way to handle the bill?
    a. Split it equally, without regard to who ordered what (C)
    b. Split it according to how much each person makes (I)
    c. The group leader pays the bill or decides how to split it (C)
    d. Compute each person's charge according to what that person ordered (I)
2. You are buying a piece of art for your office. Which one factors is the most important in deciding whether to buy it?
    a. It is a good investment (I)
    b. Your coworkers will like it (C)
    c. You just like it (I)
    d. Your superior will approve of it (C)
3. Suppose you had to use one word to describe yourself. Which one would you use?
    a. Unique (I)
    b. Competitive (I)
    c. Cooperative (C)
    d. Dutiful (C)
4. Happiness is attained by
    a. Gaining a lot of status in the community (C)
    b. Linking with a lot of friendly people (C)
    c. Keeping one's privacy (I)
    d. Winning in competitions (I)
5. You are planning to take a major trip that is likely to inconvenience a lot of people at your place of work, during your absence. With whom will you discuss it, before deciding whether or not to take it?
    a. No one (I)
    b. My parents (C)
    c. My spouse or close friend (C)
    d. Experts about the place I plan to travel to so I can decide if I want to go (I)
6. Which one of these four books appears to you to be the most interesting?
    a. How to make friends (C)
    b. How to succeed at work (I)
    c. How to enjoy yourself inexpensively (I)
    d. How to make sure you are meeting your obligations (C)
7. Which is the most important factor in an employee's promotion, assuming that all other factors such as abilities and performance are equal? Employee is or has
    a. Loyalty to the corporation (C)
    b. Obedient to the instructions form management (C)

    c. Able to think for him- or herself (I)
    d. Contributed to the corporation much in the past (I)
8. When you buy clothing for a major social event, you would be most satisfied if
    a. You like it (I)
    b. Your spouse likes it (C)
    c. Your friend likes it (C)
    d. It is elegant that it will dazzle everyone (I)
9. In your opinion, in an ideal society national budgets will be determined so that
    a. All people have adequate incomes to meet basic needs (C)
    b. Some people will be rewarded for making brilliant contributions (I)
    c. There will be maximal stability, law, and order (C)
    d. People can feel unique and self-actualized (I)
10. When people ask me about myself, do you
    a. Talk about my ancestors and their traditions (C)
    b. Talk about my friends, and what we like to do (C)
    c. Talk about my accomplishments (I)
    d. Talk about what makes me unique (I)
11. Suppose your spouse and your parents do not get along very well. What would you do?
    a. Nothing (I)
    b. Tell my spouse that I need my parents' financial support and he or she should learn to handle the politics (I)
    c. Tell my spouse that they should make a greater effort to "fit in with the family" (C)
    d. Remind my spouse that my parents and family are very important to me and they should submit to their wishes (C)
12. Terms of five people entered a contest. Your team won first place and a prize of $100/₹10,000. You and another person did 95% of the work for this contest. How should the money be distributed?
    a. Split it equally, without regard to who did what (C)
    b. The other person and I get 95% of the money and the rest goes to the group (I)
    c. The group leader decides how to split the money (C)
    d. Divide the money the way that gives me the most satisfaction (I)
13. Imagine you are selecting a band for a fund-raising event given by your organization. Which are the most important factors in making your decision?
    a. I really like the band (I)
    b. My friends approve of this band (C)
    c. The administration of my organization approves of the band (C)
    d. The band will draw a large crowd (I)
14. For a job promotion you need to take a course. Which course will you be most interested in attending?
    a. The one that will help me get ahead of everyone else (I)
    b. The one friends and family suggest I take (C)
    c. The one my colleagues plan to take (C)
    d. The one that seems most interesting to me (I)
15. You are at a pizza restaurant with a group of friends. How should you decide what kind of pizza to order?

a. The leader of the group orders for everyone (C)
b. I order what I like (I)
c. We select the pizza that most people prefer (C)
d. We order the most extravagant pizza available (I)

16. Which candidate will you vote as the leader of a local group you are a part of?
    a. The one most group members are voting for (C)
    b. The one I like best (I)
    c. The one who will reward me personally (I)
    d. The one who is a member of an organization important to me. The status of the origination will improve if that candidate is elected (C)

Scoring: Highest ranked Individualist opinions will receive a score of 1. The scores of all 16-scenarios will be added to develop a total Cultural Orientation score. Scores of 9 and above will be categorized as Collectivist and scores of 8 and below will be categorized as Individualist.

Appendix G: MacArthur Scale of Subjective Social Status
Adult Version

This survey accompanies a measure in the SPARQTools.org Measuring Mobility toolkit*, which provides practitioners curated instruments for assessing mobility from poverty and tools for selecting the most appropriate measures for their programs.To get a copy of this document in your preferred format, go to "File" and then "Download as" in the toolbar menu.*

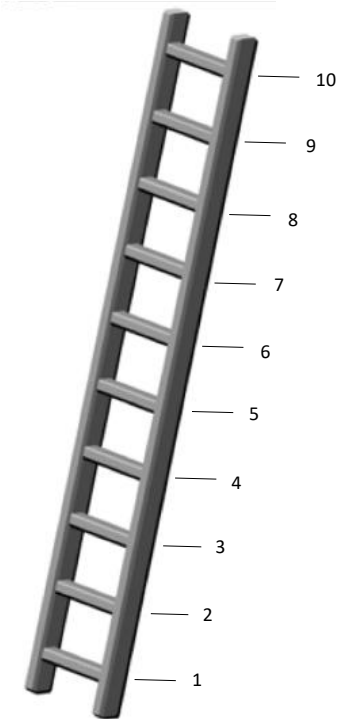
Age: Adult
Duration: < 3 minutes
Reading Level: 6th to 8th grade
Number of items: 2
Answer Format: 1-10 placement on the ladder

Scoring:
The Socioeconomic Status Ladder subscale item is Q1. The Community Ladder subscale item is Q2. Each rung of the ladder corresponds with numbers from 1 through 10. If a participant marks an "X" on the bottom rung, their response is scored as *1*. If they mark an "X" on the middle rung, their response is scored as *5*. If they mark an "X" on the top rung, their response is scored as *10*.

Sources:
Adler, N. E., Epel, E. S., Castellazzo, G., & Ickovics, J. R. (2000). Relationship of subjective and objective social status with psychological and physiological functioning: Preliminary data in healthy, White women. *Health Psychology, 19*(6), 586-592.

Instructions: Think of this ladder as representing where people stand in the United States.
Instruction: Imaging that this ladder is a picture of how India/U.S. is set up. At the top of this ladder are the people who have most money, the highest amount of schooling, the best jobs, and the most respect. At the bottom of the ladder are the people who have least money, little or no education, no jobs or jobs that no one wants, and the least respect.

Now think about your family. Tell us where you think your family would be on the ladder?


10
9
8
7
6
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4
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1