SOCIAL SUPPORT AND PARENTAL STRESS AMONG PARENTS OF YOUNG CHILDREN WITH AUTISM SPECTURM DISORDER: AN INTERNATIONAL COMPARISON OF UNITED STATES AND CHINA

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Parents of young children with autism spectrum disorder (ASD) are more likely to experience high parental stress compared to other parents, and social support has been identified in previous research as an effective buffer against stress. However, limited research has evaluated the associations between different types of social support and stress in parents of young children with ASD, the possible impact of cultural background on parents' stress levels, and their use and experience of social support. The goal of this study was to examine the association between perceived, received, informal, and formal social support and parental stress level among U.S. and Chinese parents of young children (ages 0-6) suspected or diagnosed with ASD. Results showed that a high percentage of parents in both samples experienced high levels of parental stress: 81% in the U.S. sample and 96% in the Chinese sample. U.S. parents' (n = 64, mean age = 35 years) stress levels decreased as their perceived support increased. However, none of the four types of social support, individually or combined, were significantly associated with parental stress among Chinese parents (n = 45, mean age = 32 years). The results implied that ASD programs in the United States and China need to include parental stress as one of the foci of

intervention. Additionally, due to the growing foreign and immigrant populations in the United States, ASD programs need to have a service delivery model that can accommodate to the needs of families with diverse cultural backgrounds.

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1.0 INTRODUCTION

According to the most recent National Health Interview Survey (NHIS), the estimated lifetime prevalence of Autism Spectrum Disorder (ASD) in the United States (U.S.) is 2.24% among children between ages 3-17 (Zablotsky, Black, Maenner, Schieve, & Blumberg, 2015), and the ASD prevalence rate has tripled since year 2000 (Center for Disease Control and Prevention [CDC], 2016). The Diagnostic and Statistical Manual of Mental Disorders (DSM-5), which is one of the most commonly used tools for psychiatric diagnosis, defines ASD as "persistent deficits in social communication and social interaction across multiple contexts" (American Psychiatric Association, 2013, p. 27). ASD occurs in all races and ethnicities in the United States, and it has been identified in Asia and Europe (CDC, 2016). However, the national prevalence of ASD in China is unknown due to the lack of a national database system (Chang, Dou, & Liu, 2013). Based on published studies, it is estimated that 12.8 per 10,000 (0.128%) Chinese children have ASD (Wan et al., 2013). It is suspected that ASD is currently under-detected and under-diagnosed in China (Sun et al., 2013).

Caring for young children with ASD is highly stressful for many parents in the United States and China (Caroll, 2013; Gon, Du, Li, Zheng, An, & Wu, 2012). High parental stress needs to be taken seriously because it negatively affects parents' well-being (Berk, 2014) and ultimately children's development and well-being. First, for example, high parental stress has a direct association with insecure attachment (Jarvis & Creasey, 1991; Reda & Hartshorne, 2008),

and insecure attachment could create anxiety in the parent-child relationship and could lead to children's minimizing affect or exaggerating distress (Howe, 2006). Second, high parental stress can lead to a higher rate of parental depressive symptoms (Singer, Elthridge, & Aldana, 2007), and depressive symptoms are associated with negative parent-child bonding and interactions (Downey & Coyne, 1990; Moehler, Brunner, Wiebel, Reck, & Resch, 2006). Third, high maternal stress is significantly related to high potential for child abuse (Rodriguez & Murphy, 1997).

Social support has been identified as one of the main healthy techniques to reduce stress (American Psychological Association [APA], 2015; Caroll, 2013; Cheng & Pickler, 2009; Dagenais et al., 2006; Kazak & Wilcox, 1984). Nevertheless, there are at least two main limitations among existing studies that demonstrate significant associations between social support and parental stress. First, not all types of social support have a significant positive association with parental stress (Cheng & Pickler, 2009; Hadadian, 1994; Singer et al., 2007), and none of the studies with parents of children with ASD examine the impact of different types of social support. Therefore, the present study examined four types of social support which were deemed effective in previous research with parents and other populations—perceived versus received support and formal versus informal support—and examined their impact on parental stress among parents of young children (ages 0-6) with ASD. Perceived support is the individuals' belief that support is available when they need it, and received support is the actual help that individuals receive from others. Formal support includes services that individuals received from organized groups or agencies, and informal support is the support that individuals receive from their friends and families.

The second limitation of existing research on parental stress and social support is that the majority of studies with parents of children with disabilities were conducted on middle-class Caucasian mothers in the United States (Button, Pianta, & Marvin, 2001; Figueiredo & Costa, 2009; Singer et al., 2007). This bias in research is problematic because the United States is known for ethnic diversity. For example, the number of Chinese and Chinese Americans in the United States doubled between 1990 to 2010. The latest report in 2010 showed that there are more than three million Chinese immigrants in the United States, not including the illegal and unreported immigrants, and the population is still increasing (U.S. Census Bureau, 2001, 2011). Prior studies report that the perception of disabilities and social support could vary among cultures. For example, Chinese culture views children's disabilities as punishments for the sin from the child or the parents' past life (Chiang & Hadadian, 2010; Holroyd, 2003). Such a perspective may impact parents' psychological adjustment and levels of received social pressure; parents could feel shameful and want to hide the disability from people outside their families. Moreover, a recent study demonstrated that Asian and Asian Americans (including Chinese) benefit from different types of social support than do European Americans. Specifically, Asians and Asian American adults prefer and benefit more from social support when they do not need to directly share their concerns and feelings, but the opposite is true in European Americans (Taylor, Welch, Kim, & Sherman, 2007). Nevertheless, this study was conducted on college students in laboratory settings, and no studies have examined whether such differences are generalizable across contexts and situations, such as raising a young child with disabilities.

The increasing Chinese population in the United States indicates that early childhood educators and service providers have an increasing likelihood of working with Chinese parents of children with ASD, and many of those parents would still retain their indigenous norms.

Given that 1) high parental stress is also common among Chinese parents of young children with ASD (Gon et al., 2012; Qing, Su, & Kao, 2008) and 2) the types of support that have been found to benefit Caucasian parents of young children with disabilities may not be generalizable to Chinese parents, it is important to understand ways to best support these parents. Therefore, the present study included a U.S. and a Chinese parent sample to examine if the association between different types of social support and parental stress vary between the two groups.

Jezewski and Sotnik (2005) stated that "disability service systems are cultural systems themselves" with their own values and beliefs, and clients enter services with their own cultural backgrounds. The differences between these two cultural systems need to be understood for effective and relevant service to take place. The aim of the present study is to identify the most effective support for Chinese and U.S. parents, so early education and early intervention professionals may become more culturally competent when supporting family well-being and child development. Additionally, differences between the U.S. and Chinese parents will inform early education programs about the importance of adapting their service delivery model to accommodate for cultural and ethnic diversity.

2.0 REVIEW OF LITERATURE

2.1 A THEORETICAL FRAMEWORK FOR EXPLORING ASSOCIATIONS BETWEEN PARENTAL STRESS AND SOCIAL SUPPORT

The present study is guided by three main theories—family systems theory, stress-buffering hypothesis, and the ecological systems theory. First, the family systems theory (Kazak, 1989, Kazak, Simms, & Rourk., 2002; Seligman & Darling, 2007) states that a family is an organized, complex, and interrelated system. Families are often the primary and most powerful system that impacts individual development. All individuals in a family are interactive and interdependent, so anything that occurs to one individual also affects all other members in the same family system. The family systems theory explains why a child's ASD is not just limited to impacting the child, but instead, it has an impact on all the members in the family system. Specifically, the child's disability often interrupts the system's organization, stability, and homeostasis and requires significant changes in several of its members. For example, family members often need to adjust their expectation and goals for the child, adopt new roles, examine their values and beliefs towards disabilities and ASD, cope with their emotions and stigma towards disabilities and ASD within themselves and in the environment, and learn new information about the disability and ways to best care for the child.

Each family system responds to the child's disability, adjusts to changes, and finally obtains a new sense of stability, in different ways. These variations are largely determined by the family's adaptability, and the *ABCX* family crisis model summarizes factors that affect a family's adaptability to life events (Hill, 1949, 1958, Seligman & Darling, 2007). The *ABCX* model states that *A* (the stressful event) interacts with *B* (the family's resources) and *C* (the meaning the family ascribed to the event) to produce *X* (the crisis). For example, all families of children with ASD experience the diagnostic process (*A*). However, families have difference resources at the time of their child's diagnosis, such as their access to treatments, their ability to afford treatments, the quality of services and support offered by physicians and developmental specialists at diagnosis, and the support parents receive from friends and extended families (*B*). Additionally, families vary in their perception of ASD and of having a child with a developmental disability (*C*). All these factors could impact whether families perceive the diagnosis of ASD as a crisis (*X*) and eventually how they adapt to the child's disability.

The family systems theory further states that "family is more than an assemblage of individuals who function in a dynamic interrelationship to each other" (Seligman & Darling, 2007, p. 21). There are also different subsystems within each family system, and the parental subsystem is one of the central subsystems. The parental subsystem consists of reciprocal interactions between parents and children regarding discipline, education, and caretaking. For example, compared to parents of typically developing children, parents of children with ASD are more likely to encounter communication challenges and problem behaviors (Caroll, 2013; Davis & Carter, 2008; Estes et al., 2013). Moreover, some parents need to stop working or work fewer hours to fulfill all the caregiving needs, such as accompanying their children to various medical and specialty service appointments. All the changes associated with caring for a child with a

disability often result in the disruption of the system's homeostasis and thus lead to both long-term and short-term discomfort and distress (Kazak, 1989). This prediction is well supported by research, which points out that parents of young children with ASD are more likely than other parents to experience high levels of parental stress (Estes et al., 2013; Hayes & Watson, 2013; Valicenti-McDermott et al., 2015). Therefore, parental stress is one of the major variables examined in the present study (see Figure 1).

The second guiding theory of the present study is the stress-buffering hypothesis of social support (Cohen & Pressman, 2004; Cohen & Will, 1985; Shonkoff, Hauser-Cram, Krauss, & Upshur, 1992). First introduced in 1976 by John Cassel and by Sidney Cobb (Cassel, 1976; Cobb, 1976), this hypothesis states that social support can decrease negative effects and promote adaptation during both acute and chronic stressful experiences. In other words, social support can both prevent an individual's stress reaction to stressors and intervene after stress is experienced (Seligman & Darling, 2007). According to the theory, social support can be provided by individuals in informal relationships or by professionals in formal settings.

As pointed out earlier by the family systems theory, caring for children with ASD is stressful for many parents, and the stress-buffering hypothesis suggests that social support would help them cope with this stressful experience. The impact of social support was also addressed earlier by the *ABCX* model, which states that resources available to families when encountering stressful events could impact their response and adaptability to the events. Although the stress-buffering hypothesis is generally supported by correlational research (Cohen & Pressman, 2004), studies have pointed out that not all forms of social support have the same beneficial effects (Bolger, Zuckerman, & Kessler, 2000; Cheng & Pickler 2009; Hadadian, 1994). The potential benefits of different types of support vary depending on the types of stressful events. For

example, Hadadian (1994) found that higher perceived but not received social support was associated with lower parental stress. As depicted in the conceptual model (Figure 1), the second outcome examined in the present study is the different types of social support and their associations with parental stress (see Figure 1).

The third guiding theory is the ecological systems theory (Bronfenbrenner, 2005; Bronfenbrenner & Morris, 2006), which addresses the impact of culture on individuals, families, and social support demonstrated in the conceptual model (see Figure 1). This theory states that an individual develops in a complex and nested set of systems, and each individual and his surrounding systems have complex and bidirectional impact on each other. The theory divides the systems into four different levels—microsystem, mesosystem, exosystem, and macrosystem. The first level, the microsystem, consists of people and activities in an individual's immediate surrounding that have direct impact on the individual, such as families, peers, and teachers. Second, the mesosystem consists of the connections between microsystems. For example, parents and teachers of a child with ASD can collaborate to promote the child's language development. The third layer is the exosystem, which consists of social settings that have immediate impact on the microsystem but not the individual. For example, parents' workplace could be an exosystem: if the workplace allows parents a flexible work schedule, then parents would be able to accompany their child to different specialty services.

The outermost layer, the macrosystem, consists of the larger context, such as cultural values, ideology, laws, and customs. The operation of individuals, families, and social support systems are all affected by the macro-level cultural factors that are present in the society (Seligman & Darling, 2007). For example, culturally based beliefs of disability and children can affect how families adapt to their children's ASD, and cultural beliefs and customs can affect the

family's perception and use of social support. Therefore, the conceptual model (Figure 1) shows that cultural background could modify the connection between parental stress and social support.

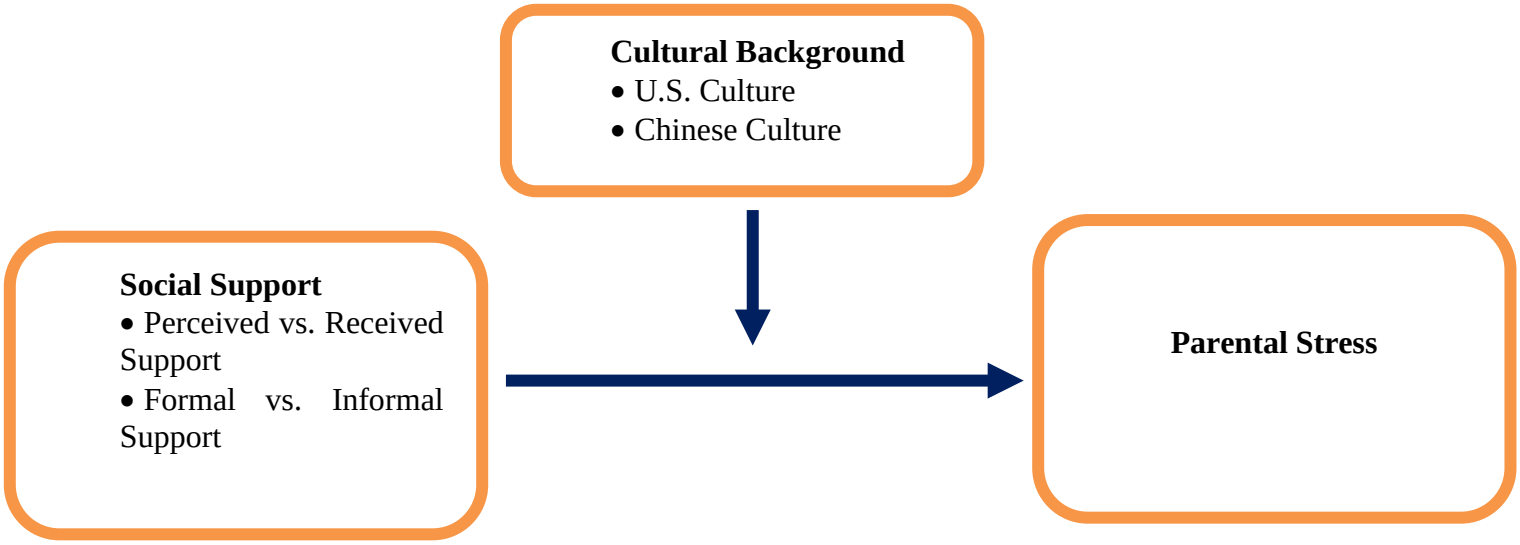

Figure 1. Theoretical and conceptual model for parental stress and social support and the impact of cultural background, based on the stress-buffering hypothesis, the ecological systems theory, and the family systems theory.

Figure 1 demonstrates the connections among parental stress, social support, and cultural background based on the family systems theory, the stress-buffering hypothesis of social support and the ecological systems theory. These three theories complement each other and form a strong foundation for the present study. Both family systems and ecological theorists view family members as having mutual impact on each other; therefore, parents are affected by their children's disabilities, and parents' well-being could affect their children's well-being and development. The ecological systems theory and the stress-buffering hypothesis then state that social support could buffer parental stress. Finally, according to the ecological systems theory, the connection between social support and parental stress could be affected by differences in cultural backgrounds.

2.2 DIAGNOSIS OF AUTISM SPECTRUM DISORDER

In the United States, the mean age of diagnosis of ASD is over 4 years old (Centers for Disease Control and Prevention Department of Health and Human Services [CDC-HHS], 2007). However, research shows that reliable and valid diagnoses could be made as young as age 2 (Lord et al., 2006). Zuckerman and colleagues (2015) found a mean delay of 2.7 years between parents' initial conversation with a provider and diagnosis of ASD; studies found that there is often a delay between parents' initial concern and the final diagnosis of ASD due to several reasons (Newschaffer et al., 2007; Woods & Saffo, 2011). First, ASD is a spectrum disorder that varies in severity, so it is not always easy for parents and medical professionals to clearly identify the disability. Second, early care providers, educational professionals, and medical professionals receive limited training on the early signs of ASD. Some red flags of ASD could be observed as early as during the infancy, including the lack of intentional communication acts (i.e. babbling, use of gestures, joyful expressions), unusual visual fixation and examination, and decreased social interest and engagement (Rogers et al., 2014; Woods & Saffo, 2011). Third, there is limited health-care plan coverage and access to comprehensive diagnostic evaluation (Caroll, 2013; Woods & Watherby, 2003). Research found that poorer children and children living in rural areas are diagnosed with ASD at a later age than their peers (Mandell, Novak, & Zubritsky, 2005). On the other hand, higher levels of parental income and educational levels are associated with earlier diagnosis and higher satisfaction with the diagnostic process (Foundation, King, & Barman, 2011; Goin-kochel, Mackinstosh, & Myers, 2006). In the U.S., multiple efforts have been made to improve early identification and diagnosis of ASD because it is believed that early intervention leads to better child and family outcomes (Woods & Saffo, 2011). Several

ASD studies examined the impact of intervention on children younger than 3 years old and reported improvements in their social and communication skills (Dawson et al., 2010; Kasari, Paparella, Freeman, & Jahromi, 2008).

Most diagnoses of ASD in China occur after age 3. The directors of child development centers (data collection sites of the Chinese sample of the present study) in China and an expert in special education, Professor Zeng of Special Education at East China Normal University, stated that, due to the lack of knowledge and treatment resources for ASD, most Chinese children are not diagnosed with ASD and/or referred to child development centers for specialty services until after age 3. Most of the Chinese children attend kindergarten (kindergarten in China includes both preschool and kindergarten) at age 3, and children with symptoms of ASD are often identified by their teachers due to their challenges in learning and social interaction. As a consequence, most of their students are enrolled at age 3 and older. Due to the recent effort to improve parents' and health care professionals' awareness of ASD and other developmental disabilities, the centers have noticed a slow but constant increase in the number of children enrolled before age 3 (J. Chen, personal communication, July 18, 2013).

The present study limited the age range of children to ages birth to 6 because the majority of children with ASD receive their formal diagnosis within this age range. The present study did not include parents of children at older ages because parents tend to encounter different challenges and stressors at different stages of their children's development (Caroll, 2013; Saligman & Darling, 2007; Wilker, Wasow, & Hatfield, 1981). Moreover, research pointed out that parents of younger children with ASD may experience higher stress levels compared to parents of older children with ASD (Behr & Murphy, 1993; Schieve et al., 2011). Therefore, all

parents enrolled in the present study had at least one child birth to 6 years who was suspected or diagnosed with ASD.

2.3 PARENTAL STRESS

Raising a child with ASD is challenging for many parents in the United States and China. Nevertheless, the specific stressors experienced by parents in both countries could vary due to differences in cultural backgrounds and levels of resources, which will be explained in details later in this chapter and Chapter 2.5. In the United States, parents of children with ASD report higher levels of stress compared to parents of typically developing children and even parents of children with other developmental disabilities (Eisenhower, Baker, & Blacher, 2005; Estes et al., 2013; Hayes & Watson, 2013; Hoffman, Sweeney, Hodge, Lopez-Wagner, & Looney, 2009; Valicenti-McDermott et al., 2015). The high stress levels experienced by parents caring for their child with ASD are explained and predicted by the family systems theory (Kazak, 1989), which states that a child's disability often interrupts the homeostasis of the family system and the parent-child subsystem. Such lack of homeostasis could thus lead to chronic and temporary distress. For example, a parent may need to take frequent time-off from work or stop working to accompany her child to multiple medical and specialty appointments.

Stress experienced by parents when caring for young children with disabilities could come from a variety of sources, such as medical and behavioral issues, medical expenses, availability and quality of intervention and education, and society's attitudes towards individuals with disabilities (Carroll, 2013). Additionally, several characteristics that are especially common among children with ASD are associated with high parental stress, such as language delays,

communication difficulties, cognitive impairments, and behavior problems (Davis & Carter, 2008; Dunn, Bulbine, Bowers, & Tantgleff-Dunn, 2001; Estes et al., 2013; Gabriels, Cuccaro, Hill, Ivers, & Goldson, 2005). Moreover, most children with ASD are not identifiable by their physical appearance, so their parents are often blamed and criticized for poor discipline and control when their children demonstrate problem behaviors in public (Carroll, 2013). Other common stressors experienced by parents of young children with ASD and other developmental disabilities include delayed diagnosis, acceptance of diagnosis, acquisition of information about the disability, and the management of specialty services, early intervention services, and childcare placement. When children reach the age of preschool or kindergarten, around the time when diagnoses often occur, parents also need to help children transition to new educational environments and collaborate with professionals and educators to arrange appropriate educational placements for their children (Seligman & Darling, 2007).

Parents of young children with ASD are more likely to experience high parental stress, and high levels of stress need to be addressed due to its potential negative impact on parents and child development. First, high levels of stress could have a negative impact on parents' physical and emotional well-being. Research found that high psychological stress could weaken an individual's immune response, which both increases ones' susceptibility to illness and decreases ones' ability to recover from illness (Fagundes, Bennett, Denrry, & Kiecolt-Glaser, 2011; Robles & Carroll, 2011). Studies have also found that high parental stress is associated with poor quality of sleep in parents of children with developmental disabilities (Gallagher, Phillips, & Carroll, 2010), and poor sleep quality is associated with hypertension, aggression, and irritability (Bruno et al., 2013; Kamphuis, Meerlo, Koolhaas, & Lancel, 2012). Additionally, high parental stress is associated with higher rates of depressive symptoms (Caroll, 2013; Singer, 2006). Depressive

symptoms for parents need to be handled appropriately because they are associated with negative parent-child bonding and interactions, poor parental adaption and adjustment, and increased perceived difficulty in the parenting role (Creasey & Jarvis, 1994; Carroll, 2013; Downey & Coyne, 1990; Moehler et al., 2006; Weissman & Paykel, 1974).

Second, high parental stress could hinder parents' ability to meet their children's needs and thus impact the children's well-being and development. Children naturally seek "protection, care, and guidance" from their parents, and parents naturally respond to meet their children's needs (Shapiro & White, 2014, p. 67); this mutual parent-child interaction and relationship is essential for children's development and well-being (Klaus, Kennell, & Klaus, 1995; Shapiro & White, 2014). However, high parental stress is often associated with lower levels of parental sensitivity and positive responses when caring for their children and is thus associated with higher rates of negative psychosocial outcomes in children, such as increased behavioral problems (Creasey & Jarvis, 1994; Zaidman-Zait et al., 2014). Third, high parental stress is associated with insecure attachment between parent and child (Jarvis & Creasey, 1991; Lovejoy, Graczyk, O'Hare, & Neuman, 2000; Reda & Hartshrone, 2008). Insecure attachment could lead to both immediate and long-term negative consequences on children's development, such as minimizing affect or exaggerating distress (Ainsworth, Blehar, Waters, & Wall, 1978; Howe, 2006). Studies have also identified insecure attachment as a predictor of anxiety, depression, and low self-esteem when children reach adolescence (Lee & Hankin, 2009).

Finally, high maternal stress was found to be associated with high potential for child maltreatment (Algood, Hong, Gourdine, & Williams, 2011; Crouch & Behl, 2001; Rodriguez, & Murphy, 1997). Rodriquez and Murphy studied 33 mothers of children with developmental disabilities and found that high parental stress was strongly correlated with child abuse potential.

Jonson-Reid and colleagues (2012) concluded that chronic child maltreatment is a robust indicator of negative outcomes in childhood (such as head injury, mental health treatment, violent delinquency, STD treatment, substance use, and suicide attempts) and in adulthood (such as perpetrators of child maltreatment, substance abuse, and need for mental health treatment). This ongoing bidirectional impact between children's development and parents' stress levels are clearly described by both the family systems theory and the ecological systems theory, which state that parents and children have reciprocal impact on each other.

In China, there are limited studies on stress levels of parents caring for young children with ASD. Existing studies show that Chinese parents of children with ASD also experience high levels of parental stress compared to parents of typically developing children (Gon et al., 2012; Qing et al., 2008). In a qualitative study, researchers conducted focus groups and individual interviews with Chinese families of children with developmental disabilities and concluded that there are seven categories of resources needed by these families (Hu, Turnbull, Summers, & Wang, 2015). First, families need financial resources to cover their basic living needs and expenses associated with caring and educating their children with disabilities. Financial resources are especially needed by families who need to relocate from rural areas to large cities to gain access to special education and specialty services. Second, families expressed difficulties obtaining appropriate medical and professional services for the child with disabilities and other family members. Third, families expressed needs for higher quality education and therapy for their children. Fourth, caregivers need home-based education and information on their children's disabilities and development. Fifth, families need better social inclusion for both parents and children. Sixth, families in urban areas expressed needs for support to improve caregivers' emotional health, such as stress management. Such support was considered as not needed by

families in rural areas because emotion support was perceived as “an excessive desire” (Hu et al., 2015, p. 70). Seventh, both parents in urban and rural areas expressed needs for support regarding their children’s future planning. According to the ecological systems theory and the *ABCX* model, such inadequacy of resources for Chinese families could have an impact on parents’ responses and adaptability to caring for a child with ASD and could thus increase the likelihood of high parental stress.

Parental stress levels in ASD research are mostly measured using self-report questionnaires. The most commonly used parental stress measures in the United States and China are the Parenting Stress Index (PSI) and the PSI-Short Form (Abidin, 1995). Self-report instruments are easy to administer and provide information on participants’ personal experiences and perspectives. Nevertheless, this method of data collection is prone to social desirability bias, misinterpretation of questions, and low accuracy of responses. Both versions of the PSI address these possible problems by obtaining high results of test-retest reliability and validity in the United States and China.

2.4 SOCIAL SUPPORT

Social support is an important buffer for people in stressful situations, including raising a child with a developmental disability (AbuAlrub, 2004; Fischer, Corcoran, & Fischer, 2007; Ozbay, Flitterling, Charney, & Southwick, 2008). The potential impact of social support on parental stress and well-being is also addressed by the stress-buffering hypothesis and the ABCX model. Wills (1991) defined social support as “the perception or experience that one is loved and cared for, esteemed and valued, and part of a social network of mutual assistance and

obligations" (cited in Taylor et al., 2004). Social support is complex and multidimensional (Lindsey & Yates, 2004), and not all types of social support were found to have significant positive associations with lower stress (Cheng & Pickler, 2009; Hadadian, 1994; Singer et al., 2007). Consequently, each form of social support needs to be examined to better understand its different effects on various stressful experiences. However, due to the complexity of social support and its lack of a universally accepted definition, many measures were created to measure specific categories and dimensions of social support (Lindsey & Yates, 2004). The lack of standard measurements of social support creates challenges when comparing results from various social support studies.

The following subsections describe two of the most common ways to categorize social support: perceived versus received social support and formal versus informal social support. As shown in Figure 2, theoretically, perceived and received social support could be either informal or formal, and formal and informal social support could be either perceived or received by an individual. However, due to the design of the social support measures used by the present study, the formal and informal support could not be categorized as perceived or received support; only perceive and received support items could be categorized as informal or formal resources.

	Formal support	Informal support
Received support		
Perceived support		

Figure 2 A matrix of four types of social support: received, perceived, formal, and informal support

2.4.1 Perceived vs. received social support

Social support can be received or perceived. Received social support is the actual help that one receives from others, and perceived social support is the belief that support will be available when needed (Barrera, 1986). As implied by the definition, the levels of perceived support are based on subjective perception of support, which could be affected by individual differences in perceptual and judgment processes. In other words, perceived support may not always reflect the actual support available in the environment; support that people perceive as available may not be actually provided when needed (Haber, Cohen, Lucas, & Baltes, 2007). On the other hand, received support is a better indication of the actual availability of support.

Although received support, compared to perceived support, may be a more realistic reflection of resources in an individual's environment, perceived social support has been more consistently found to promote psychological health and have stress-buffering effects (Kessler & McLeod, 1985; Norris & Kaniasty, 1996). Wethington and Kessler (1986) found that perceived support is more important than received support in predicting individuals' adjustment to stressful events. Research also concluded consistent positive effects of perceived social support specifically on parental stress (Bristol, 1984; Tak & McCubbin, 2002). Bristol (1984) found that low-stress mothers of children with autism reported higher levels of perceived support, and mothers with greater perceived support reported fewer depressive symptoms and happier marriages. Nevertheless, unlike the general studies that showed inconsistent stress-buffering effect of received social support, studies specifically on parents of children with disabilities show that received formal social support delivered by professionals has consistent positive effect on parental stress (Carroll, 2013; Plant & Sanders, 2007; Singer et al., 2007).

These studies showed that this division of social support (received versus perceived support) could be a good way to identify supports that benefit or do not benefit parents of children with ASD. Currently, there is a need for more recent studies that examine the possible different impact of received and perceived social support on the stress levels among parents of children with ASD. Updated research is needed because the quality and availability of ASD services are constantly changing, which could have an impact on children and parents' responses to them. Conducting social support studies directly with parents of children with ASD is important because different populations (including parents of children with other developmental disabilities) may have different needs for perceived and received support.

Understanding of the effects of social support on parents in China is limited. One of the leading experts in early childhood education in China stated that there are few studies on parents' use and response to social support in China (F. L. Zeng, personal communication, July 20, 2013). In addition, the researcher proposing the present study was unaware of any studies that examined the impact of different forms of social support on parental stress among Chinese parents of children with ASD. A Chinese study on the association between parental stress and social support was conducted with mothers who physically abused their children in Hong Kong. Chan (1994) found that 1) the number of people to count on in time of need, 2) perceived neighborhood support, 3) satisfaction with spousal relationship, and 4) degree of community involvement all have a buffering effect on Chinese parents' stress levels. Literature also pointed out that, compared to Americans, Asians in general are more likely to use problem avoidance and social withdrawal to cope with stress (Chang, 2001). Therefore, the present study hypothesizes that, compared to received support, perceived social support will be more beneficial to decreasing parental stress levels among Chinese parents.

There is no existing instrument that measures and distinguishes levels of both received and perceived support among parents in the United States and China. Therefore, the present study selected one instrument for received support (Inventory of Socially Supportive Behavior; ISSB) and one instrument for perceived support (Sense of Social Support; SSS) from the list of instruments identified by Lindsey and Yates (2004) as having stronger evidence of validity and reliability. ISSB was also one of the most extensively used measures of received support (Haber et al., 2007).

2.4.2 Formal vs. informal social support

Another way to categorize social support is formal versus informal social support. The present study examined the impact of formal and informal support on parental stress because this categorization of social support has been frequently used on families with children (Boyd, 2002). Formal social support is the assistance that parents receive from an organized group or agency, and informal social support is the support that parents receive from "the immediate and extended family, friends, neighbors, and other parents of children with disabilities" (Schopler & Mesibov, 1984, p. 297). Both formal and informal social support have shown significant positive effects on parental stress in the United States (Chiang, 2014; Estes et al., 2014; Hassall, Rose, & McDonald, 2005; Singer et al., 2007; Smith, Oliver, & Innocenti, 2001). For example, mothers of children with autism have identified informal social support as the most important support for them—specifically support from spouse, mother's relatives, and other parents of children with disabilities (Bristol, 1984).

The Family Support Scale (FSS), created by Dunst, Trivette, and Jenkin (2007), is the only self-report social support instrument designed to 1) measure formal and informal support

and 2) measure social support of parents of young children. It is also the most commonly used instrument to measure family social support among parents of young children with disabilities. Nevertheless, most of the studies that used FSS only reported the total stress score (a combination of formal and informal support); they did not report the separate informal and formal support scores and their association with parental stress (Hall & Graff, 2011; Hassall et al., 2009; Theule, Wiener, Rogers, & Marton, 2011).

To our knowledge, no research has distinguished the different impact of formal and informal support among Chinese parents. There is one study that found stress-buffering benefits of formal support (parent education program) on parents of Chinese American children with ASD in the United States (Chiang, 2014). However, findings on Chinese American parents in the United States may not be generalizable to parents in China due to possible differences in their cultural background; Chinese Americans may have been acculturated by the U.S. culture. In addition, there are major differences between formal services for families of young children with ASD in the United States and China, and these differences are likely to have an impact on parents' experience with formal support. Formal support for families of children with ASD in these two countries will be described in the following paragraphs.

In the United States, the Individuals with Disabilities Education Act (Individuals with Disability Education Act Amendments of 1997 [IDEA], 2004) mandates free services and education to all children with disabilities. IDEA, Part C requires states to provide voluntary early intervention to children (from birth to 3 years old) with disabilities or at risk for disabilities. IDEA, Part B requires states to provide free public education to all children with disabilities from ages 3 to 21 (IDEA, 2004; Smith & Rous, 2011).

If children from birth to 3 receive a formal diagnosis of ASD, parents can voluntarily enroll them in free early intervention services. ASD is a complex neurodevelopmental disorder, and children demonstrate different patterns of characteristics. Moreover, autism interventions vary in their treatment approach. Therefore, it is important to select the most appropriate interventions for each child based on the child's and the family's unique needs. There are seven general characteristics that are associated with effective interventions for young children with ASD: begin intervention programs as soon as ASD is suspected, receive intensive instruction (minimum five hours per day, five days for week), apply repeated planned teaching opportunities, provide sufficient individualized adult attention, include family intervention, conduct ongoing assessments and adjustment, and prioritize instruction on communication, socialization, and problem behaviors and the maintenance and generalization of newly learned skills (Woods & Saffo, 2011). After children with ASD turn 3 years old or if they receive a diagnosis at age 3 or older, the public schools in their areas of residence are required to assess the children and coordinate needed educational and specialty services, including transportation.

China is a country with vast cultural, economic, and geographic diversities, and there are great disparities among standards of living across regions. The Compulsory Education Law (Disability Rights Education and Defense Fund, Seventh National People's Congress, 1986) led to improved integration of children with special needs into regular school classrooms, but such integration was often done for practical reasons; many regions did not have adequate resources to build special schools (Eichner, Groark, & Palmov, 2011). A few years later, the 1990 Law of the People's Republic of China on the Basic Protection of Disabled Person encouraged the implementation of special education programs in early childhood, which states that preschools must accept students with disabilities if they are able to adapt in regular schools and classrooms

(Disability Rights Education and Defense Fund, Seventh National People's Congress, 1990; Eichner et al., 2011). Currently, education and specialty services for young children with disabilities (including ASD) vary widely among regions, and there are needs for improved availability, capacity, and quality of services for these children and their families (Eichner et al., 2011; Hu et al., 2015; J. Chen, personal communication, July 18, 2013).

Currently, parents in China need to pay out of pocket for autism specialty services. Some cities (i.e. Shanghai) offer annual reimbursement for specialty services, but it is available only to registered residents of the cities (not all residents of the cities could become the cities' registered residents) and it covers only a portion of the annual tuition (J. Chen, personal communication, July 18, 2013). For example, in 2013, an autism specialty program in Shanghai charged 35,400 Chinese Yuan (CNY) annually for their part-time program (40 hours per month) and 59,400 CNY annually for their full-time program (100 hours per month). The annual reimbursement for children with ASD in Shanghai was 12,000 CNY. Moreover, the availability of autism specialty services varies greatly among areas in China; some families had to relocate to big cities so that their children could receive appropriate services.

Autism programs in China vary in their content of services and treatment approaches, but most of them only focus on child development; very few programs provide formal services to support parents' well-being. Nevertheless, many programs required children to be accompanied by an adult caregiver when receiving services, and those caregivers (including parents) naturally formed informal support for each other (J. Chen, personal communication, July 18, 2013). Overall, Chinese caregivers of children with developmental disabilities reported that they needed better formal and informal support for their children and families, such as social inclusion, high

quality special education and specialty services (both during childhood and adulthood), and education and information for caregivers (Hu et al., 2015).

2.5 U.S. AND CHINESE CULTURES: PERCEPTION OF DISABILITY AND SOCIAL SUPPORT

Although numerous studies have confirmed the stress-buffering effect of social support on parental stress, most of this research has been conducted with Caucasian parents in the United States (Figueiredo & Costa, 2009; Singer et al., 2007). The underrepresentation of the Chinese population in this area of research may be problematic because their cultural background may impact their perception of disabilities and their use and response to social support. As addressed by the ecological systems theory, culture could have an impact on individual development and the bidirectional impact between an individual and her support system. This suggests that services designed to meet the needs of the majority of parents (Caucasian parents) may not be equally beneficial or culturally appropriate for Chinese parents.

2.5.1 Perception of disabilities: Comparison of United States and China

The perception of disabilities in the United States can be summarized by three models of disabilities (Caroll, 2013; Olkin 2002; Seligman & Darling, 2007). The moral model views disabilities as tests for one's faith or as consequences of moral lapse or sin. Although this religious perspective of disabilities is less prevalent in the present day, its influence can still be

found. For example, some people believe that there is “a reason” why some parents give birth to children with disabilities.

The medical and social models are more relevant to the current U.S. view of disability, and both models have important contributions to the deinstitutionalization of individuals with disabilities. The medical model views disabilities as conditions that require medical treatment. The social model views disabilities as caused by society; society creates social and physical barriers that prevent full integration of people with disabilities in the society, such as curbs for wheelchairs and stigma towards disabilities. Stigma that are often associated with people with disabilities include 1) they relegate their own separate place in society and this segregation is viewed as beneficial to them, 2) they are inferior compared to people without disabilities, and 3) they are evaluated by the category of having a disability rather than their individual characteristics (Safilio-Rothschild, 1970; Seligman & Darling, 2007).

Chinese culture has its unique perspective on children with disabilities. “Disability is viewed as a punishment for the disabled person’s sins in a past life or the sins of the person’s parents” (Liu, 2005, p. 68). This stigma could make Chinese families experience mixed feelings of guilt and shame towards having children with disabilities (Lam, 1992). Parents of children with ASD could feel guilty towards their children if they believe that their sins or their ancestor’s sins are responsible for their children’s disability. Parents may also feel shameful towards people outside the family because having a child with ASD implies that someone in the family has done something disgraceful enough to deserve such a severe punishment. Additionally, Chinese parents generally have high educational aspirations for their children (Seligman & Darling, 2007; Wang, Michaels, & Day, 2011), and certain symptoms of ASD could interfere with academic

performance. Consequently, some Chinese parents prefer to hide their children's diagnosis of ASD from others (Ling, Mark, & Cheng, 2010).

2.5.2 Perception and use of social support: Comparison of United States and China

One important cultural difference that could influence people's view and use of social support in the United States and China is individualism versus collectivism. The majority of people in the United States are more individualistic (Kim, Sherman, & Taylor, 2008). People with an individualistic perspective focus on individual independence and value the importance of individual decisions, including relationships. When needing support, they assume that it is their responsibility to proactivity seek their needed support and resources, and others could choose whether to provide help (Taylor et al., 2007).

In contrast, Chinese culture adopts the collectivistic perspective, which emphasizes the importance of interdependence and in-group harmony (Kim et al., 2008). Individuals are viewed as connected to others, and group goals are considered as more important than individual beliefs and needs. They generally prefer giving to rather than receiving from their interconnected groups. During stressful times, people in collectivistic cultures are cautious about bringing personal issues and needs to others. This avoids creating burdens for their social networks and losing face (Chang, 2014; Kim et al., 2008; Taylor et al., 2007).

Earlier research and literature show that Asian and Asian Americans are less willing to seek social support and benefit less even from perceived social support compared to European Americans (Kim, Sherman, Ko, & Taylor, 2006; Pearson & Chan, 1993; Taylor et al., 2004). However, most of these studies measured social support from the Western perspective that focused on the explicit seeking and receiving of support (Kim et al., 2008), which is often

considered as undesirable in collectivistic cultures. When such cultural differences were addressed in the research design, studies showed that both European Americans and Asian and Asian Americans benefit from social support but in different forms (Taylor et al., 2007).

Specifically, Asians and Asians Americans benefit both physically and psychologically more from implicit social support, while European Americans benefit more from explicit social support in stressful situations (Taylor et al., 2007). Kim and colleagues (2008) defined explicit social support as people directly seeking advice and expressing emotions openly to others; explicit support could be either formal or informal or either perceived or received support. In contrast, implicit social support means that people feel a sense of belonging to a group without openly disclosing the stressful events; implicit support could also be either formal or informal or either perceived or received support. Studies also found that Chinese families of children with developmental disabilities most frequently use avoidance to cope with disability-related stress (Lam & Mackenzie, 2002; Wang et al., 2011). All these findings suggest that the patterns of association between parental stress and different types of social support could differ among parents with different cultural backgrounds.

2.6 DEMOGRAPHICS

The present study collected parent and child demographic information from all parent participants. The questions regarding parents included their age, gender, ethnicity, number of years lived in the United States (only the U.S. sample), income, education, and number of children diagnosed with disabilities. The child items included the child's current age, diagnosis, and age when autism intervention started. All the demographic items addressed in the present

study have been identified as having important influence on parental stress and parental experience when caring for a child with disabilities. All the demographic items and their supporting literature are summarized in Table 1.

Table 1. Demographic questions and their supporting literature

Demographic Item	Purpose & Supporting Research
Parent Information	
Age	Higher maternal and parental ages are associated with child's diagnosis of ASD (King & Bearman, 2011). Parents' age could also impact their readiness to parent (Gager, McLanahan, & Glei, 2002) and thus their stress levels.
Gender	Prior studies found that mothers and fathers of children with ASD could vary in their parental stress and experience with child caring (McStay, Trembath, & Dissanayake, 2014; Rivard, Terroux, Parent-Boursier, & Mercier, 2014).
Ethnicity	Categories used for this item are taken from the Colby and Ortman's article, published by U.S. Census Bureau (2015). Perception of disabilities and the impact of social support could vary among different cultures (Chiang & Hadadian, 2010; Taylor et al., 2004; Taylor et al., 2007).
Number of years lived in the United States	Number of years living in the receiving country is commonly used as a marker of acculturation (Schwartz, Pantin, Sullivan, Prado, & Szapocznik, 2006).
Income	Parents of children with autism are more likely to experience economic hardship associated with caring for their children (Valicenti-McDermott et al., 2015), and economic hardship has been associated with higher levels of stress (Jewell, Luecken, Gress-Smith, Crnic, & Gonzales, 2015). Studies also found that age of ASD diagnosis is later for poorer children (Mandell et al., 2005). The income categories for this item were used in McStay, Trembath, and Dissanayake's study (2014).

Table 1 (continued)

Education	Low level of parental education is identified as a primary risk factor of economic hardship (National Center for Children in Poverty, 2015), and the impact of economic hardship was described above. The categories of education attainment for this item were used in the U.S. census (U.S. Census Bureau, 2015).
Number of children diagnosed with disabilities	Research identified higher levels of stress among parents caring for multiple children with disabilities compared to one child with disabilities (Harley et al., 2012).
Child Information	
Age	The child's age is collected to ensure that the child is within the age range of birth to 6 years. Parents' experience with child caring could vary according to children's ages (Wilker et al., 1981).
Diagnosis	Prior to the release of the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) in 2013, Autism Spectrum Disorder was divided into three diagnoses—autistic disorder, Asperger's disorder, and pervasive developmental disorder. Based on the age range of the U.S. and Chinese samples, it is possible that some children were diagnosed using DSM-4. The categories of this item were used in the study of McStay and colleagues (2014). The present study added the last choice: suspected for autism spectrum disorder. Meeting one of these diagnostic categories is necessary for eligibility in the present study.
Age autism intervention started	Beginning intervention before age 3 is associated with better child's outcome, such as joint attention, language development (Woods & Saffo, 2011), which could have an impact on parental stress levels.

2.7 RESEARCH QUESTIONS & HYPOTHESES

The present study aimed to examine three research questions.

1. Do all dimensions (perceived, received, formal, and informal) of social support combined have inverse associations with parental stress among U.S. and Chinese parents of children with ASD?

   It is hypothesized that, for U.S. parents, social support will be significantly associated with lower stress levels; but for Chinese parents, social support will not be associated with lower levels of parental stress.

2. Does the relation between perceived and received social support and parental stress differ for U.S. and Chinese parents?

   The present study hypothesized that, for U.S. parents, both received and perceived social support will be associated with lower parental stress levels. In contrast, for Chinese parents, only perceived social support but not received social support will be associated with lower parental stress levels.

3. Does the relation between formal and informal social support and parental stress differ for U.S. and Chinese parents?

   The present study hypothesized that both formal and informal social support will be associated with lower parental stress among both U.S. and Chinese parents.

3.0 METHODS

3.1 PARTICIPANTS

3.1.1 Chinese sample

Forty-five participants (37 mothers and 8 fathers) were recruited from three autism specialty service centers in China in 2013. The inclusion criteria were parents who 1) identified themselves as Chinese, 2) had at least one child between birth and 6 years old who was suspected or diagnosed with Autism Spectrum Disorder (ASD) and qualified for specialty services, 3) did not have a diagnosis of ASD, and 4) were at least 18 years old.

All of the participants lived in China and identified themselves as Chinese. All parents were married in this sample at the time of data collection. Due to the lack of medical resources and a standard measure of child development in China, only 56 percent of the children in this sample received a diagnosis of autism even though they were all receiving autism services. Due to the low percentage of children with a diagnosis of ASD, only the age of starting autism intervention but not the age of diagnosis was included in the analysis. Table 2 presents the comparison of the Chinese and the U.S. demographic information.

3.1.2 U. S. sample

The U.S. sample was recruited in years 2015 and 2016. Sixty-four participants (58 mothers, 1 father, 5 parents did not specify their gender) in the U.S. sample were recruited from community agencies, autism clinics, local ASD science and advocacy organizations, and ASD research projects. The inclusion criteria were parents who 1) lived in the United States, 2) had at least one child between birth and 6 years old who was suspected or diagnosed with ASD, 3) did not have a diagnosis of ASD, and 4) were at least 18 years old. The participants filled out the questionnaire either online, over the phone, or in person with the principle investigator (PI). All of the 64 parents completed at least one of the four measures included in the questionnaire.

Fifty-eight (91%) parents filled out the questionnaire online, 5 (8%) parents filled it out over the phone, and 1 (2%) parents filled it out in person. Seventeen percent of the parents in the U.S. sample had more than one child with a known diagnosis of disabilities. 72% of the parents' ethnicity were White, 9% were Black or African American, 6% were Asian, and 5% were Hispanic. Their average number of years living in the United States was 33 years. Fifty-nine of the 64 parents filled out the demographic section, and all them indicated that their child received an intervention for autism; the average starting age for the intervention was 2.13 years. Twelve children received a DSM-IV diagnosis (autistic disorder, Asperger's disorder, and pervasive developmental disorder), and 45 children received a DSM-V diagnosis (ASD). Eleven parents indicated that they had more than one child with a known diagnosis of developmental disability. Table 2 presents the comparison of the Chinese and the U.S. demographic information.

Table 2. Demographic information: Chinese and U.S. comparisons

Characteristic	China (n = 45)	United States (n = 64)	
Parents' age: *M(SD)*	32.12 (5.43)	35.49 (6.47)	
Children's age: *M(SD)*	4.38 (.97)	3.97 (1.23)	
Children's age when starting an intervention for autism: *M(SD)*	3.41 (.94)	2.13 (.71)	
Children's diagnosis	Autism or ASD: 56% Developmental delay: 22% Suspected for ASD:22%	Autistic disorder: 11% ASD: 70% Asperger's disorder: 2% PDD: 6% Suspected for ASD: 3%	
Parents' level of education	Junior high school: 13% High school: 24% College/university: 51% Graduate school and above: 9%	High school: 11% Some college: 23% Associate's degree: 15% Bachelor's degree: 19% Master's degree: 20% Doctoral degree: 3%	
Family annual income	Shanghai: 24,000 CNY (3,850 USD) - 240,000 CNY (38,500 USD) Changzhou: 12,000 CNY (1,930 USD) - 180,000 CNY (29,000 USD)	< $25,000 $25,000-$40,000 $40,000-$55,000 $55,000-$70,000 $70,000-$85,000 $85,000-$100,000 $100,000-$115,000 $115.000-$130,000 >$130,000	14% 13% 13% 13% 3% 23% 3% 1% 8%

The U.S. sample was approximately comparable to the Chinese sample on a number of variables. First, participants in both samples were parents of children who were between birth to 6 years and were suspected or diagnosed with ASD. It was important to ensure that children in both samples were within the same age range because parents often encounter different challenges at different phases of their children's development (Wilker et al., 1981), such as initial acceptance and adaption to the child's disability, education, employment, and housing issues (Caroll, 2013). Parents of children birth to 6 years with ASD often experience unexpected realization that their children diverge from normal cognitive and social development. Additionally, they often experience the diagnostic process and formal diagnosis of their children, the complex organization of various specialty services, and the difficulties during transition to the school system. Studies found that parents of younger children with ASD may experience higher levels of stress compared to parents of older children with ASD (Behr & Murphy, 1993; Schieve et al., 2011). Therefore, the present study recruited U.S. parents of children within the same age range as used in the Chinese sample.

Second, both samples included participants from various SES backgrounds. Many parents of children with disabilities report experiencing economic hardship associated with caring for their children (Carroll, 2013; Valicenti-McDermott et al., 2014). Low-SES has been associated with poor parent well-being (Santiago, Wadsworth, & Stump, 2011), and higher parental education and income were associated with children's earlier diagnosis of autism (Goin-Kochel et al., 2006). The Chinese government did not categorize people into different SES groups, but the participants' incomes could be compared to the city average. The city average was used instead of the national average because average salaries could vary widely in different regions. The average annual salary in Shanghai was 60,435 Chinese Yuan Renminbi (CNY) in 2013,

which approximately was equivalent to 9,700 USD (Shanghai Census Bureau, 2014). And the average annual salary of the Chinese participants in Shanghai was 117,600 CNY (18,865 USD), ranging from 24,000 CNY (3,850 USD) to 240,000 CNY (38,500 USD). In 2013, the average annual salary in Changzhou was 60,802 CNY (9,800 USD) in government agencies and 37,101 CNY (6,000 USD) in private companies (Changzhou Census Bureau, 2016). And the average annual salary of the Chinese participants in Changzhou was 74,784 CNY (12,000 USD), ranging from 12,000 CNY (1,930 USD) to 180,000 CNY (29,000 USD). Because of the wide range of incomes in the Chinese sample, this study recruited U.S. parents from a similarly wide range of incomes.

Third, severity of ASD, was not possible to be used in the present study because most Chinese parents did not know the severity level of their children's ASD. China did not have a standard measure of child development (Eichner et al., 2011), and Chinese doctors did not always identify the severity of ASD when making diagnoses (J. Chen, personal communication, July 18, 2013). Moreover, there were inconsistent findings on the relation between the severity of children's ASD and parental stress (Bebko, Konstantareas, & Springer, 1987; Freeman, Perry, & Factor, 1991; Rivard et al., 2014); some studies did not find a significant association between severity of disorder and parental stress (Rivard et al., 2014; Rodriguez & Murphy, 1997).

GPower was conducted to determine the minimum sample size needed for each sample to have sufficient statistical power to detect significant effects. Social support shows a low to medium relation with parenting stress: Cohen's f^2 = .05 to .11 (Britner, Morog, Pianta, & Marvin, 2003; Cheng & Peckler, 2009). The effect size is expected to increase to a medium effect with the overall demographic variables in the model (Cohen's f^2 = .15, and increase of R^2

= .03 to .09). To detect this increased effect with a power of .80 and α = .05, 55 subjects are required (Cohen, 1992).

3.2 DATA COLLECTION SITES AND PROCEDURE

The present study collected data from the Chinese sample in 2013 and collected data from the U.S. sample in 2015 and 2016. The 45 Chinese participants were recruited from three private child development centers in China, two in Shanghai and one in Changzhou. The 66 U.S. participants were recruited from multiple sites in the Northeast of the United States in years 2015 and 2016. The data collection sites for both samples were chosen based on accessibility and convenience.

3.2.1 Chinese sample

Forty-five Chinese parents were recruited by the directors and the teachers at three child development centers for children with ASD. Parents filled out printed questionnaires in the order described in the Measures section (section 3.3), either in a small group or individually with the Principle Investigator (PI) at the centers' conference rooms; most parents completed the questionnaires within 30 minutes, but some parents needed more time. When the questionnaires were administered in small groups, parents were told to focus on their own questionnaires and not to discuss their answers with their neighbors while filling out the questionnaires. The participation was voluntary, and the participants did not receive any incentives. Nevertheless, the

parents were encouraged to stay after the study to ask the PI questions related to autism and the service delivery model in the United States.

3.2.2 U. S. sample

The second sample of the present study was made of 64 parents recruited from community agencies, clinics for children with autism, research labs, and local ASD science and advocacy organizations distributed printed or electronic flyers describing the present study to parents. Some printed fliers had a second page that asks parents to fill out their name and phone number or email if they were interested in participating in the present study. The electronic copy instructed qualified participants to fill out an online survey or contact the PI of the present study. The questionnaires were administered to parents in three different ways (in person, over the phone, online), depending on parents' preference and locations. First, the PI administered printed questionnaires to parents in a private area at the centers (either individually or in small group) or at the university; only one participant filled out the questionnaire in person with the PI. Second, the PI administered questionnaires to parents over the phone: 5 participants filled out the questionnaire this way. The PI called parents at a scheduled time, read each question to parents, and recorded their answers. Third, 58 parents chose to fill out the questionnaires online on the Qualtrics survey system. Social desirability could have had different impact on in-person, online and phone survey administration; the possible effects of different methods of survey delivery were analyzed and reported in the Result section.

3.3 MEASURES

The present study included a questionnaire with four existing measures and one demographic form. These four measures were the Parenting Stress Index (the long form for the Chinese sample and the short form for the U.S. sample), the Sense of Support Scale, the Inventory of Socially Supportive Behavior, and the Family Support Scale.

3.3.1 Parenting Stress Index (PSI) & Parenting Stress Index- Short Form (PSI-SF)

The parents' stress levels were measured using the Parenting Stress Index (PSI; Abidin, 1995), which is available in both English and Chinese. PSI is a self-report measure that has been widely used to measure parental stress in families of children with psychiatric or developmental disabilities. It contains 120 items in three domains: child characteristics, parent characteristics, and life stress. Most of the items are on a 5-point Likert scale, ranging from 1 (*strongly agree*) to 5 (*strongly disagree*). A few items are in the multiple-choice format, and three items use a 4-point Likert scale. The total stress scores above the 85^{th} percentile indicate significantly high levels of stress and appropriate referrals are recommended. The PSI manual reports that the test-retest reliability coefficient of PSI is .95, and the internal consistency alpha coefficient is .90 (Abidin, 1995). A recent study in the U.S. reported that the PSI's test-retest reliability ranged from 0.63 to 0.96 and internal consistency alpha coefficient ranged from 0.70 to 0.90 (Chiang, 2014). The completion of the measure is estimated to take 20 minutes. PSI has been validated and used in several Chinese studies (Chan, 1994; Huang et al., 2013; Pearson & Cha, 1993; Tam, Chan, & Wong, 1994).

Several parents during the first round of data collection (Chinese sample) mentioned that the PSI was too lengthy, and some parents spent 40-60 minutes completing all measures. Therefore, to ensure the quality of response, the PI decided to use the PSI-Short Form (instead of the complete PSI) with the U.S. sample (Abidin, 1995). The 36 questions of the PSI-SF are taken directly from the complete PSI, with identical wording and rating scales. The questions are divided into three domains: parental distress (PD), parent-child dysfunctional interaction (P-CDI), and difficult child (DC). The total stress scores above the 85th percentile in PSI-SF also indicate significantly high levels of stress and appropriate referrals are recommended. The PSI manual reports an overall test-retest reliability coefficient of PSI-SF is .84, and the internal consistency alpha coefficient is .91 (Abidin, 1995). A recent study reported that PSI-SF has internal consistency alphas ranged from 0.78 to 0.92 (Ben-Sasson, Soto, Martinez-Padraza, & Carter, 2013). It generally takes less than 10 minutes to complete the PSI-SF. The present study compared the PSI-SF results of the Chinese and the U.S. samples, and it calculated the internal consistency of both samples (see Table 7).

3.3.2 Perceived Social Support: Sense of Support Scale (SSS)

Sense of Support Scale (SSS; Dolbier & Steinhardt, 2000) is available in English. It was translated into Simplified Chinese by a native Chinese speaker enrolled in a psychology graduate program in the United States, and it was back translated into English. It includes 21 self-report items to measure a person's perceived availability of social support. On a 4-point Likert scale, "0" means "not at all true" and "3" means "completely true." Items 4, 6, 12, 15, 18, 20, and 21needed to be reverse coded when calculating the total score. This measure has an internal consistency of alpha = .84-.86, and a test-retest stability correlation of .91 (Dolbier & Steinhardt,

2000; Kearney et al., 2014). The present study compared the SSS results of the Chinese and the U. S. samples and included the internal consistency of both samples (see Table 7).

3.3.3 Received Social Support: Inventory of Socially Supportive Behavior (ISSB)

The Inventory of Socially Supportive Behavior (ISSB; Barrera, Sandler, & Ramsay, 1981) is available in English. It was translated into Simplified Chinese by a native Chinese speaker enrolled in a psychology graduate program in the United States, and it was back translated into English. It includes 40 self-report items to measure a person's received social support. On a 5-point Likert scale, "0" means "not at all" and "4" means "about every day." This measure has an internal consistency with an alpha of .93 to .94, and a test-retest stability correlation of .88 (Barrera et al., 1981); the internal consistency reported in a recent study was a Cronbach α of .96 (DeFreese & Smith, 2013). The present study compared the ISSB results of the Chinese and the U.S. samples. The present study also calculated the internal consistency of both samples (see Table 7).

3.3.4 Informal and Formal Social Support: Family Support Scale (FSS)

The Family Support Scale (FSS; Dunst et al., 2007) is available in English. It was translated into Simplified Chinese by a native Chinese speaker enrolled in a psychology graduate program in the United States, and it was back translated into English. It includes 18 self-report items to measure the helpfulness of the support and the network complexity people receive from family, informal and formal sources. On a 5-point Likert scale, "1" presents "not at all helpful," and "5" presents "extremely helpful." The measure has an internal consistency alpha of .77, and

the test-retest reliability of the measure over a one-month interval was .91 (Dunst et al., 2007); a recent study report that the FSS has an internal consistency alpha of .75 (Theule et al., 2011). The present study will compare the FSS results between the Chinese and the U.S. samples. The present study will calculate the internal consistency of both samples. The present study made a modification when interpreting the formal and informal support score. The original measure categorizes item 17 (school/daycare center) as informal support, but many parents in both samples perceived their children's teachers as trained professionals and many children received specialty services at school settings. Therefore, this item was considered as formal support when the scores were computed (see Table 7).

3.3.5 Demographic Form

Demographic forms were designed for the present study to collect parents and their children's demographic information. The demographic form for the Chinese sample included 1) parents' gender, age, income, education, marital status, profession, and birthplace, and 2) children's insurance, age, diagnosis, age of diagnosis, formal support services, and the time enrolled in the services. The demographic form was modified for the U.S. sample to collect data on relevant factors that match current literature (see section 2.5 for the U.S. demographic items).

3.4 ANALYSIS PLAN

3.4.1 Missing Data

When there were missing data in social support scales, a *t*-test was conducted to compare the full data set and the ones with missing data to determine whether the data were missing completely at random (MCAR; Little, 1988). If there was no relation with the demographics or the outcomes, Multiple Imputation was applied to impute the missing data. When there were missing data in the PSI, a potential score was calculated for the item based on the average score of the subscale. This potential score computation method for all missing data was included in the PSI handbook (Abidin, 1995; R. Abidin, personal communication, October 19, 2015).

3.4.2 Data Analysis—Step One

The data analysis plan was divided into three steps. During the first step of data analysis, the means and standard deviations of the PSI-SF total stress score, PSI-SF three sub-scores (PD: Parental Distress, P-CDI: Parent-Child Dysfunction Interaction, DC: Difficult Child), SSS, ISSB, and FSS were calculated for the U.S. and Chinese samples. The descriptive statistics (means, standard deviations, and sample sizes) of the U.S. and Chinese samples are summarized and presented in Table 7.

3.4.3 Data Analysis—Step Two

Data analysis at Step Two determined 1) which PSI-SF scores and 2) the demographic information that needed to be included in the next step of data analysis (Step Three). Table 3 includes the list of analyses that were conducted at this step.

Table 3. Data analyses at Step Two

Data analysis	Purpose
Pearson correlations were calculated between the PSI-SF sub-scores (PD: Parental Distress, P-CDI: Parent-Child Dysfunction Interaction, DC: Difficult Child) in both the Chinese and U.S. samples.	Based on the size of correlation between the sub-scores, the researcher determined whether to include the PSI-SF sub-scores (in addition to the total stress scores) at data analysis Step Three.
Pearson correlations (interval and ratio data) and Spearman correlations (ordinal data) were calculated between all the demographic information (covariates) in both the Chinese and U.S. samples.	The researcher would consider combining or removing certain demographic information if there were any significant correlations between covariates.
Pearson correlations were calculated between the demographic information (covariates) and the results from all social support and parental stress measures (PSI-SF, SSS, ISSB, FSS).	Any demographic items that had high correlation with one or more of the social support and parental stress measures ($p < .05$) were included in data analysis Step Three as covariates.

3.4.4 Data Analysis—Step Three

The data analysis plan at this step, guided by the three research questions of the present study, is summarized in Table 4.

Table 4. Data analysis at Step Three: research questions, measures, and data analysis plan

Research Questions	Measures	Data Analysis
Research Question 1: Do all dimensions (perceived, received, formal, and informal) of social support combined have inverse associations with parental stress among U.S. and Chinese parents of children with ASD?	PSI-SF, SSS, ISSB, FSS, Demographics	A two-stage hierarchical multiple regression was performed with parental stress as the dependent variable. The demographic items that significantly correlated with parental stress and social support measures were entered at stage one, and the perceived, received, formal, and informal social support (from SSS, ISSB, FSS) were entered at stage 2. The results allowed us to examine the unique contribution of social support after controlling for demographic background. This regression model was conducted on both the U.S. and Chinese samples. The data were screened for the assumptions (linearity, normality, multicollinearity, homoscedasticity, outliers) and influential cases.
Research Question 2: Does the relation between perceived and received social support and parental stress differ for U.S. and Chinese parents?	PSI-SF, SSS, ISSB, Demographics	• A simple regression was conducted between parental stress as the dependent variable and perceived support (SSS) as the independent variable in the U.S. and Chinese samples. The regression coefficients of both samples were compared.

Table 4 (continued)

			• A simple regression was conducted between parental stress as the dependent variable and received support (ISSB) as the independent variable in the U.S. and Chinese samples. The regression coefficients of both samples were compared • A multiple linear regression was performed between parental stress as the dependent variable and perceived and received social support (from SSS, ISSB) as independent variables in the U.S. and Chinese samples. The SPSS output of this analysis included 1) the correlation between perceived support and parental stress, 2) the correlation between received support and parental stress, 3) the semipartial correlation between perceived support and parental stress (unique contribution of perceived support towards predicting parental stress), 4) the semipartial correlation between received support and parental stress (unique contribution of received support towards predicting parental stress), and 5) the multivariate correlation (R).

Table 4 (continued)

		• The result of R^2 minus the sr^2 of perceived support and parental stress and the sr^2 of received support and parental stress was the shared contribution of perceived and received support towards predicting parental stress. • The demographic items that significantly correlated with parental stress and social support measures (found in Step Two) were entered in all regression models as covariates. • The data were screened for the assumptions (linearity, normality, multicollinearity, homoscedasticity, outliers) and influential cases.
Research Question 3: Does the relation between formal and informal social support and parental stress differ for U.S. and Chinese parents?	PSI-SF, FSS, Demographics	• A simple regression was conducted between parental stress as the dependent variable and formal support as the independent variable in the U.S. and Chinese samples. The regression coefficients of both samples were compared. • A simple regression was conducted between parental stress as the dependent variable and informal support as the independent variable in the U.S. and Chinese samples. The regression coefficients of both samples were compared

Table 4 (continued)

		• A multiple linear regression was performed between parental stress as the dependent variable and formal and informal social support as independent variables in the U.S. and Chinese samples. The SPSS output of this analysis included 1) the correlation between formal support and parental stress, 2) the correlation between informal support and parental stress, 3) the semipartial correlation between formal support and parental stress (unique contribution of formal support towards predicting parental stress), 4) the semipartial correlation between informal support and parental stress (unique contribution of informal support towards predicting parental stress), and 5) the multivariate correlation (R). • The result of R^2 minus the sr^2 of informal support and parental stress and the sr^2 of formal support and parental stress was the shared contribution of formal and informal support towards predicting parental stress.

Table 4 (continued)

		• The demographic items that significantly correlated with parental stress and social support measures (found in Step Two) were entered in all regression models as covariates. • The data were screened for the assumptions (linearity, normality, multicollinearity, homoscedasticity, outliers) and influential cases.

4.0 RESULTS

The Results section starts with the section on missing data (Section 4.1). The following section (Section 4.2) presents the impact of different data collection methods in the U.S. sample. Section 4.3 presents the means and standard deviations of all parental stress and social support measures. Section 4.4 includes the correlations between parental stress and social support measures. Section 4.5 presents all the data analyses for the three research questions, and the final section (Section 4.6) is about the impact of different data collection methods on the U.S. sample.

4.1 MISSING DATA

4.1.1 Chinese sample

All of the data from the Chinese sample were collected in person by the Principal Investigator (PI). Before parents handed in their questionnaire, the PI reminded them to look over their questionnaire to ensure that they did not accidently skip any questions. During data analysis, no missing data were found in the social support measures. Only one missing item was found in the PSI-SF, and the PI computed the potential score for the items as instructed by the PSI handbook (Abidin, 1995).

4.1.2 U.S. sample

The U.S. sample had missing data in social support scales. An independent sample *t*-test was conducted to test whether U.S. participants with the full data set versus those with missing data differed in their parental stress levels or their demographics (when they were interval and ratio variables). The independent *t*-tests (Table 5) showed that participants with the full data set and those with missing data were not significantly different in their parental stress levels, their age, the number of years they lived in the United States, their number of children with a known diagnosis, their child's ages, and the age of their child when he/she started an intervention for autism.

A Chi-square test was conducted to test whether the participants with the full data set and the ones with missing differ in their demographics when the demographic items were categorical variables. The Chi-square tests (Table 5) showed that whether participants completed the questionnaire were not related to their gender, ethnicity, income category, level of education completed, whether they had more than one child with a known diagnosis, and their child's specific diagnosis.

Table 5. Participants with complete questionnaire vs. participants with missing data – means, standard deviations, and statistical tests of parental stress and demographic items (U.S. sample)

Variable	Group with Complete Questionnaire	Group with Missing Data	Statistical Tests	
Interval or ratio data	*M(SD)*	*M(SD)*	*t*-test	*P*
Parental stress (PSI-SF Total)	105.21 (23.57)	111.47 (17.59)	$t(61) = -.95$	.46
Parents' age	35.22 (6.52)	36.64 (6.42)	$t(57) = -.65$	.93
Years parents live in United States	32.35 (9.42)	33.27 (10.89)	$t(57) = -.28$	.96
Number of children with known diagnosis	1.29 (.69)	1.09 (.30)	$t(56) = .97$	.56
Child's age	4.05 (1.26)	3.64 (1.02)	$t(57) = 1.01$	.73
Age of child starting intervention	2.11 (.74)	2.23 (.61)	$t(56) = -.51$	.68
Categorical data			χ^2	Carmer's *v*	*p*
Parents' gender			$\chi^2(1, n=59) = .23$	.06	.63
Parents' ethnicity			$\chi^2(3, n=59) = 3.34$	.24	.34
Income categories			$\chi^2(8, n=58) = 8.71$	.39	.37
Level of education			$\chi^2(5, n=59) = 4.70$	.28	.45
Whether had more than 1 child with diagnosis			$\chi^2(1, n=59) = .80$	.12	.37
Child's specific diagnosis			$\chi^2(4, n=59) = 2.02$	.19	.72

The *t*-tests and Chi-square tests presented above showed that the missing data were missing completely at random (MCAR) and were not systematically related to other measures in the study. Therefore, the Multiple Imputation was performed to impute the missing data for the following social support items: FSS 8 and ISSB 13, 26, 31, 35, 39. The pooled means of these six social support items are presented in Table 6.

Table 6. Pooled means computed by Multiple Imputation for social support items with missing data – U.S. sample

Social Support Measure	Item	Number of U.S. Participants used the Pooled Mean	Pooled Mean
Family Support Scale (FSS)	8: [Helpfulness of] my older child(ren)	1	1.32
Inventory of Socially Supportive Behavior (ISSB)	13: Made it clear what was expected of you	1	1.87
Inventory of Socially Supportive Behavior (ISSB)	26: Agreed that what you wanted to do was right.	1	2.28
Inventory of Socially Supportive Behavior (ISSB)	31: told you that she/he feels very close to you.	1	2.41
Inventory of Socially Supportive Behavior (ISSB)	35: Taught you how to do something.	1	1.58
Inventory of Socially Supportive Behavior (ISSB)	39: Pitched in to help you do something that needed to be done.	1	2.17

As instructed by the PSI handbook (Abidin, 1995), the potential scores (the average score of the subscale) were computed for the five missing items in PSI-SF. The entire subsection of the PSI-SF was not included in the analysis when there was more than one missing item in a subsection.

4.2 IMPACT OF DIFFERENT DATA COLLECTION METHODS IN THE U.S. SAMPLE

A one-way ANOVA was performed on the PSI-SF total, SSS, ISSB, FSS informal, and FSS formal as a function of the methods of data collection (online, over the phone, in person). There was no significant difference on the mean of the PSI-SF total scores among the three methods of data collection, $F(2, 60) = .51$, $p = .61$. There was no significant difference on the mean of the SSS scores among the three methods of data collection, $F(2, 58) = 2.06$, $p = .14$. There was no significant difference on the mean the ISSB score among the three methods of data collection, $F(2, 57) = 1.91$, $p = .16$. There was no significant difference on the FSS informal scores among the three methods of data collection, $F(2, 56) = 1.27$, $p = .29$. There was no significant difference on FSS formal scores among the three methods of data collection, $F(2, 56) = .74$, $p = .48$.

4.3 STEP ONE – MEANS AND STANDARD DEVISIONS OF STRESS AND SOCIAL SUPPORT MEASURES

The means, standard deviations, and internal consistency of PSI-SF total score, the PSI-SF three sub-scores (PD, P-CDI, DC), SSS, ISSB, and FSS (total, formal support, and informal support) are presented in Table 7, separately for the two samples. All available data from the 64 U.S. participants were used for analysis, but not all participants completed all measures in the questionnaire. Therefore, the U.S. sample size for each measure varied. Independent sample *t*-

tests were also performed to examine whether the results of each parental stress and social support were significantly different between the Chinese and the U.S. samples.

Table 7 shows U.S. parents have significantly lower parental stress means but larger standard deviations than the Chinese parents. Also, both samples have parental stress scores substantially above what is considered typical for parents of children with a disability, based on the PSI manual (Abidin, 1995). U.S. parents received more support and found formal support more helpful than Chinese parents.

Table 7. Mean, standard deviation, and internal consistency of stress and social support measures

	China				United States				China and U.S. comparison	
Measure	*M*	*SD*	*n*	Cronbach's α	*M*	*SD*	*n*	Cronbach's α		*p*
PSI-SF total: parental stress	115.69	13.66	45	.83	106.70	22.32	63	.92	$t(106) = 2.40$	.02
Percentage of PSI-SF total stress at 85th percentile or above – clinical intervention recommended	96%		45		81%		63		$\chi^2 (1, n=108) = 4.96$ Carmer's $v = .21$	.03
PSI-SF: parental distress (PD)	39.71	6.21	45		36.38	9.54	63		$t(106) = 2.05$	.04
PSI-SF: parent-child dysfunction interaction (P-CDI)	34.44	5.03	45		29.60	8.38	63		$t(106) = 3.46$	.001
PSI-SF: difficult child (DC)	41.53	6.06	45		40.66	9.43	64		$t(107) = .55$	.58
SSS: perceived support	37.96	8.39	45	.83	36.21	11.28	61	.88	$t(104) = .87$	.39
ISSB: received support	90.67	26.19	45	.95	133	24.59	60	.95	$t(103) = 3.17$	.002

Table 7 (continued)

FSS: informal and formal	32.62	10.46	45	.78	35.51	13.33	59	.82	$t(102) = -1.20$	.23
FSS: informal support	22.58	8.16	45		21.00	11.26	59		$t(102) = .79$	.43
FSS: formal support	10.40	4.61	45		14.51	4.62	59		$t(102) = -4.50$	< .01

4.4 STEP TWO – CORRELATIONS BETWEEN PSI AND DEMOGRAPHIC INFORMATION

4.4.1 PSI-SF Total and Subscales

Pearson correlations were computed between the PSI-SF total score and PSI-SF sub-scores in the Chinese sample. The correlations between the PSI-SF total and the PSI-SF: PD ($r(45) = .74$, $p < .01$), the PSI-SF: P-CDI ($r(45) = .82$, $p < .01$), and the PSI-SF: DC ($r(45) = .82$, $p < .01$) were all statistically significant. The correlations between all three sub-scores were also significant. The PSI-SF: PD was significantly correlated with the PSI-SF: P-CDI ($r(45) = .38$, $p = .01$) and the PSI-SF: DC ($r(45) = .32$, $p = .03$), and the PSI-SF: P-CDI was significantly correlated with the PSI-SF: DC ($r(45) = .62$, $p < .01$). Pearson correlations were also computed between the PSI-SF total score and sub-scores in the U.S. sample. The correlations between the PSI-SF total and the PSI-SF: PD ($r(63) = .79$, $p < .01$), the PSI-SF: P-CDI ($r(63) = .83$, $p < .01$), and the PSI-SF: DC ($r(63) = .83$, $p < .01$) were all statistically significant. The correlations between all three sub-scores were also significant. The PSI-SF: PD was significantly correlated

with the PSI-SF: P-CDI ($r(63) = .47$, $p < .01$) and the PSI-SF: DC ($r(63) = .44$, $p < .01$), and the PSI-SF: P-CDI was significantly correlated with the PSI-SF: DC ($r(63) = .59$, $p < .01$). Given these high correlations, only the PSI-SF total score was included in data analysis Step Three.

4.4.2 Demographic items: combined, removed, or not

Pearson correlations were computed between the parents' age, the children's age, the age of the child when he/she started an intervention for autism, and the family income in both the Chinese and U.S. samples. Scatterplots were generated for all possible pairs of variables, and none of the outputs showed a nonlinear relationship. This meant that all of them met the assumption of linearity. Spearman rank-order correlations were conducted between the parents' age, the children's age, the age of the child when he/she started an intervention for autism, the family income, and the level of education (ordinal variable) in both samples. None of the correlations were at the level of $r = .8$ or above, so these demographic items were not combined or removed in further analyses. The results are presented in Table 8.

An independence sample *t*-test was conducted to test whether the parents' age, the children's age, the age of children when starting an intervention, and the family income were significantly different between mothers and fathers in both the Chinese and U.S. samples. A one way between-subject ANOVA was performed on the parents' age, the children's age, the age of children when starting an intervention, and the family income as a function of the children's diagnosis in both samples. A one way between-subject ANOVA was performed on the parents' age, the children's age, the age of children when starting an intervention, and the family income as a function of the parents' ethnicity in the U.S. sample. Only the relationships between parents' gender and family income and the one between parents' ethnicity and children's age in the U.S.

sample were found significant, so the present study did not remove or combine these demographic items in further analyses. The results were presented in Table 8.

Due to the low percentage of children in the Chinese sample received a diagnosis of ASD, the age of diagnosis was not included in the analysis; instead, the age of starting an autism intervention was used in the analyses. The results found that, in both samples, neither the family income nor the parents' level of education significantly correlated with the children's age of starting an intervention for autism.

Table 8. Analysis of demographic items – China and U.S. sample

	China		United States	
Pearson Correlations (interval or ratio variables): Parents' Age, Child's Age, Child's Age of Starting Intervention, Family Income				
		p		*p*
Parents' Age & Child's Age	$r(43) = .25$	.10	$r(59) = .25$	.06
Parents' Age & Child's Age of Starting Intervention	$r(42) = .36$	.02	$r(58) = .21$	.12
Parents' Age & Family Income	$r(42) = .23$	.14	$r(58) = .29$	.03
Child's Age & Child's Age of Starting Intervention	$r(44) = .69$	< .01	$r(58) = .33$	.01
Child's Age & Family Income	$r(43) = .04$	.80	$r(58) = -.02$	.89
Family Income & Child's Age of Starting Intervention	$r(42) = -.70$	.66	$r(57) = .05$	.70
Spearman rank-order correlations (ordinal variable): Parent's Level of Education				
Parent's Level of Education & Parents' Age	$r(43) = .24$	.12	$r(59) = .21$	.10
Parent's Level of Education & Child's Age	$r(44) = .07$	.67	$r(59) = .08$	.53
Parent's Level of Education & Child's Age of Starting Intervention	$r(43) = -.15$	.33	$r(58) = .10$	.47
Parent's Level of Education & Family Income	$r(43) = .40$	.01	$r(58) = .37$	.004
Independent-sample t-tests (categorical variable-2 levels): Parents' Gender				
Parents' Gender & Parents' Age	$t(41) = -1.17$	.25	$t(57) = -.70$	.49
Parents' Gender & Child's Age	$t(43) = -.49$	.63	$t(57) = -.80$	.43
Parents' Gender & Child's Age of Starting Intervention	$t(42) = -.04$	.97	$t(56) = -.18$	.86
Parents' Gender & Family Income	$t(41) = -1.72$	.09	$t(56) = 2.01$	.049

Table 8 (continued)

A one way between-subject ANOVA (categorical variable- more than 2 levels): Child's Diagnosis				
Child's Diagnosis & Parents' Age	$F(2, 40) = 2.82$	.07	$F(4, 54) = 1.93$	.12
Child's Diagnosis & Child's Age	$F(2, 42) = .24$	.79	$F(4, 54) = 1.29$	.29
Child's Diagnosis & Child's Age of Starting Intervention	$F(2, 41) = .01$	.99	$F(4, 53) = .98$	.43
Child's Diagnosis & Family Income	$F(2, 40) = 2.02$	.15	$F(4, 53) = 1.25$	0.30
A one way between-subject ANOVA (categorical variable- more than 2 levels): Parents' Ethnicity				
Parents' Ethnicity && Parents' Age			$F(3, 55) = .44$	.72
Parents' Ethnicity & Child's Age			$F(3, 55) = 4.51$	.007
Parents' Ethnicity & Child's Age of Starting Intervention			$F(3, 54) = 1.24$	.30
Parents' Ethnicity & Family Income			$F(3, 54) = .62$	.61

4.4.3 Demographic items: covariates in data analysis Step Three

Pearson correlations were calculated between the demographic information and all the social support and parental stress scores (PSI-SF, SSS, ISSB, FSS) in the Chinese and U.S. samples. No significant correlations were found in the Chinese sample (see Tables 9). In the U.S. sample, parents' age, family income, and parent's ethnicity showed significant correlation with at least one parental stress or social support scores; therefore, they were included as covariates in data analysis Step Three (see Table 10).

Because Chinese parents needed to pay for the majority (or all) of autism services, family income was included as a covariate for the Chinese sample. Therefore, at the Step Three of data analysis, all analyses for both samples were performed twice: the first time with no covariate(s)

and the second time with covariate(s).

Table 9. The Pearson correlations between demographic information and social support and parental stress measures (China sample)

	Parent age (n = 43)	Parent gender (*n* = 45)	Family income (*n* = 43)	Parent education (*n* = 44)	Child age (*n* = 45)	Child diagnosis (*n* = 45)	Age start intervention (*n* = 44)
PSI-SF Total	-.05	-.17	-.23	.002	.04	.15	.08
PSI-SF: pd	.05	-.24	-.06	.12	-.03	-.05	.10
PSI-SF: pdci	-.18	.02	-.18	-.06	.01	.28	-.01
PSI-SF: dc	-.02	-.16	-.29	-.07	.12	.16	.09
SSS Total	.04	.09	.02	.13	.29	.05	.27
ISSB Total	-.05	-.10	.20	.10	.18	-.07	.12
FSS Total	-.01	.00	-.01	.19	.09	-.03	-.11
FSS informal	-.03	.03	-.02	.10	.04	-.04	-.09
FSS formal	.03	-.09	-.01	.24	.20	-.13	.03

* $p < .05$

Table 10. The Pearson correlations between demographic information and social support and parental stress measures (U.S. sample)

	Parent age (n = 58)	Parent gender (*n* = 58)	Family income (*n* = 57)	Parent education (*n* = 58)	Child age (*n* = 58)	Child diagnosis (*n* = 58)	Age start intervention (*n* = 57)	Ethnicity (*n* = 58)
PSI-SF Total	-.30*	-.01	-.36*	-.16	.00	-.02	-.07	-.15
PSI-SF: pd	-.19	-.03	-.28*	-.13	.03	-.02	.00	-.10
PSI-SF: pcdi	-.48*	-.06	-.28*	-.22	-.05	-.10	-.07	-.31*
PSI-SF: dc	-.09	.05	-.31*	-.06	.03	.07	-.08	.03
SSS Total	.10	.04	.34*	-.04	.09	-.11	.10	-.00
ISSB Total	-.11	.16	-.03	-.11	.12	-.07	-.02	-.11
FSS Total	.15	.05	.35*	.05	.03	-.06	-.02	.29*
FSS informal	.12	.05	.29*	.00	-.01	-.01	-.07	.23
FSS formal	.15	.02	.32*	.15	.10	-.17	.14	.27*

* $p < .05$

4.5 CORRELATIONS OF SOCIAL SUPPORT MEASURES AND PARENTAL STRESS

Pearson correlations were calculated between the four types of social support and parental stress in the Chinese sample (Table 11). Table 12 presents the Pearson correlations between the four types of social support and parental stress in the U.S. sample. The perceived and received social support are significantly correlated in both samples. The informal and formal support are also significantly correlated in both samples. In the U.S. sample, perceived social support is significantly correlated with received, informal, and formal support.

Table 11. The Pearson correlations between social support measures and parental stress (Chinese sample)

	Perceived support (SSS) (n = 45)	Received support (ISSB) (*n* = 45)	Informal support (FSS-informal) (*n* = 45)	Formal support (FSS-formal) (*n* = 45)	Parental stress (PSI-SF) (*n* = 45)
Perceived support	-				
Received support	.52*	-			
Informal support	.38*	.40*	-		
Formal support	.20	.35*	.41*	-	
Parental stress	-.26	-.10	-.10	.03	-

* $p < .05$

Table 12. Pearson correlations between social support measures and parental stress (U.S. sample)

	Perceived support (SSS) (n = 61)	Received support (ISSB) (*n* = 60)	Informal support (FSS-informal) (*n* = 59)	Formal support (FSS-formal) (*n* = 59)	Parental stress (PSI-SF) (*n* = 63)
Perceived support	-				
Received support	.56*	-			
Informal support	.56*	.35*	-		
Formal support	.32*	.16	.28*	-	
Parental stress	-.41*	-.04	-.17	-.18	-

* $p < .05$

4.6 STEP THREE – RESEARCH QUESTIONS

For each simple and multiple regression below, the major assumptions (linearity, normality, multicollinearity, and homoscedasticity) and influential cases were screened and no violations were found. In addition, the outliers were checked; there were varying numbers of outliers (0 to 6). Such outliers may influence the size and weighting ascribed to predictors. However, the identified outliers tended not to be the same participants from one analysis to

another, suggesting that any influence on outcomes was not obviously associated with a specific few respondents.

4.6.1 Research Question 1: Do all dimensions (perceived, received, formal, and informal) of social support combined have inverse associations with parental stress among U.S. and Chinese parents of children with ASD?

Hypothesis 1: It is hypothesized that, for U.S. parents, social support will be significantly associated with lower stress levels; but for Chinese parents, social support will not be associated with lower levels of parental stress.

4.6.1.1 Chinese sample

A simultaneous multiple regression was performed between parental stress as the dependent variable and the level of perceived social support, received social support, formal social support, and informal social support as independent variables for the Chinese sample, without any covariates. There was no significant prediction of parental stress by the level of these four types of social support, $F(4, 40) = .84$, $p = .51$, $R^2 = .08$, *adjusted* $R^2 = -.02$. The regression analysis summary is presented in Table 13, including the unstandardized regression coefficients (B), their standard errors (SEB), their confidence intervals, the standardized regression coefficient (β), and the squared semipartial correlations (sr^2). The comparison with the U.S. sample is presented in Table 17.

The data met the assumptions of linearity, normality, multicollinearity, homoscedasticity, and outliers, and the influential cases were screened. The VIFs ranged from 1.27 to 1.55, which were lower than 10 and suggested that multicollinearity was not much of concern (Cohen,

Cohen, West, & Aiken, 2003). A scatterplot of standardized residuals against standardized predicted values was generated. Linearity seems to hold because the scatter cloud was around the horizontal line of zero; there was no curvilinear pattern. Homoscedasticity seems to hold because the scatter cloud had approximately constant variability except a couple of outliers; the Breusch-Pagan test (p = .58) was not significant at the 5% level, which also indicated that the error terms were homoscedastic (Breusch & Pagan, 1979). The normal Q-Q plot was generated and suggested approximate normal distribution. The Shapiro-Wilk test with a p-value of .31 was not significant at the 5% level, which also suggested that the assumption of normality was satisfied. For a normal distribution, 5% distribution outside of 2 standard deviations was expected. Having 3 out of 45 subjects (about 7%) fell outside of 2 SD was higher than expected. The studentized deleted residuals and the Leverage values were also performed. For the studentized deleted residuals, no case had a magnitude above 3 and thus no case was of concern (Cohen et al., 2003). For the Leverage values, no case had leverage values greater than .27 (3*4/45) and thus no case was of concern. The largest Cook's D was .14, which was smaller than 1. Therefore, there were no influential cases in this sample (Cohen et al., 2003).

Table 13. Regression analysis summary for predicting parental stress – China sample, research question 1 (all social support), no covariate

IVs	B	SEB	95% CI	β	sr^2
Perceived Support (SSS)	-.46	.30	[-1.06, .15]	-.28	.05
Received Support (ISSB)	.01	.10	[-.19, .21]	.03	.00
FSS Informal	-.07	.30	[-.68, .53]	-.04	.00
FSS Formal	.27	.51	[-.76, 1.29]	.09	.01

A two-stage hierarchical multiple regression was performed between parental stress as the dependent variable and the level of perceived social support, received social support, formal social support, and informal social support as independent variables for the Chinese sample, controlling for the family income. The family income was entered at stage one, and the perceived, received, formal, and informal social support (SSS, ISSB, FSS formal, FSS informal) were entered at stage 2. When family income was entered, it did not significantly predict parental stress, $F(1, 41) = 2.18$, $p = .15$, $R^2 = .05$, *adjusted* $R^2 = .03$. When the perceived, received, informal and formal support were added, they did not significantly improve the prediction, R^2 *change* = .07, $F(4, 37) = .78$, $p = .55$. The entire group of variables did not significantly predict parental stress, $F(5, 37) = 1.05$, $p = .40$, $R^2 = .12$, *adjusted* $R^2 = .01$. It was concluded that there was no significant prediction of parental stress by the four types of social support, after controlling for family income. The regression analysis summary is presented in Table 14, including the unstandardized regression coefficients (B), their standard errors (SEB), the standardized regression coefficient (β), the squared semipartial correlations (sr^2), R square, and adjusted R square. The comparison with the U.S. sample is presented in Table 17.

The data met the assumptions of linearity, normality, multicollinearity, homoscedasticity, and outliers, and the influential cases were screened. The VIFs ranged from 1.07 to 1.64, which were lower than 10 and suggested that multicollinearity was not much of concern (Cohen et al., 2003). A scatterplot of standardized residuals against standardized predicted values was generated. Linearity seems to hold because the scatter cloud was around the horizontal line of zero; there was no curvilinear pattern. Homoscedasticity seems to hold because the scatter cloud had approximately constant variability except a couple of outliers; the Breusch-Pagan test ($p = .82$) was not significant at the 5% level, which also indicated that the error terms were

homoscedastic (Breusch & Pagan, 1979). The normal Q-Q plot was generated and suggested approximate normal distribution. The Shapiro-Wilk test with a *p*-value of .66 was not significant at the 5% level, which also suggested that the assumption of normality was satisfied. For a normal distribution, 5% distribution outside of 2 standard deviations was expected. Therefore, having 2 out of 45 subjects (about 4%) fell outside of 2 SD was expected. The studentized deleted residuals and the Leverage values were also performed. For the studentized deleted residuals, no case had a magnitude above 3 and thus no case was of concern (Cohen et al., 2003). For the Leverage values, no case had leverage values greater than .33 (3*5/45) and thus no case was of concern. The largest Cook's D was .15, which was smaller than 1. Therefore, there were no influential cases in this sample (Cohen et al., 2003).

Table 14. Regression analysis summary for predicting parental stress – China sample, research question 1 (all social support), covariate: family income

IVs	B	SEB	β	sr^2	R^2	ΔR^2
Step1						
Family Income	-.001	.00	-.23	.05	.05	
Step 2						
Family Income	-.001	.00	-.24	.05	.12	.07
Perceived Support (SSS)	-.43	.30	-.26	.05		
Received Support (ISSB)	.04	.10	.08	.00		
FSS Informal	-.09	.30	-.06	.00		
FSS Formal	.42	.53	.14	.01		

4.6.1.2 U.S. sample

A simultaneous multiple regression was also performed between parental stress as the dependent variable and the level of perceived social support, received social support, formal

social support, and informal social support as independent variables for the U.S. sample, without any covariates. There was a significant multivariate prediction of parental stress by the four types of social support, $F(4, 53) = 4.00$, $p = .01$, $R^2 = .23$, *adjusted* $R^2 = .17$. Table 15 presents the unstandardized regression coefficients (B), their standard errors (SEB), their confidence intervals, the standardized regression coefficient (β), and the squared semipartial correlations (sr^2). Among all the independent variables, only the SSS Total (perceived social support) contributed significantly to the prediction of parental stress, $B = -1.19$, $t(53) = -3.56$, $p = .001$, $sr^2 = .18$. The comparison with the Chinese sample is presented in Table 17.

The data met the assumptions of linearity, normality, multicollinearity, homoscedasticity, and outliers, and the influential cases were screened. The VIFs ranged from 1.14 to 1.93, which were lower than 10 and suggested that multicollinearity was not much of concern (Cohen et al., 2003). A scatterplot of standardized residuals against standardized predicted values was generated. Linearity seems to hold because the scatter cloud was around the horizontal line of zero; there was no curvilinear pattern. Homoscedasticity seems to hold because the scatter cloud had approximately constant variability except a couple of outliers; the Breusch-Pagan test ($p = .28$) was not significant at the 5% level, which also indicated that the error terms were homoscedastic (Breusch & Pagan, 1979). The normal Q-Q plot was generated and suggested approximate normal distribution. The Shapiro-Wilk test with a *p*-value of .66 was not significant at the 5% level, which also suggested that the assumption of normality was satisfied. For a normal distribution, 5% distribution outside of 2 standard deviations was expected. Having 2 out of 57 subjects (about 4%) fell outside of 2 SD was expected. The studentized deleted residuals and the Leverage values were also performed. For the studentized deleted residuals, one case (#44) had a magnitude above 3, which may be of concern (Cohen et al., 2003). For the Leverage

values, 2 cases had leverage values greater than .21 (3*4/57): cases 42 and 56 may be of concern. The largest Cook's D was .18, which was smaller than 1. Therefore, there were no influential cases in this sample (Cohen et al., 2003).

Table 15. Regression analysis summary for predicting parental stress – U.S. sample, research question 1 (all social support), no covariate

IVs	B	SEB	95% CI	β	sr^2
Perceived Support (SSS)	-1.19*	.34	[-1.87, -.52]	-.60	.18
Received Support (ISSB)	.26	.13	[-.01, .53]	.28	.06
FSS Informal	.19	.29	[-.41, .78]	.09	.01
FSS Formal	-.33	.62	[-1.58, .92]	-.07	.00

* $p < .05$

A two-stage hierarchical multiple regression was performed between parental stress as the dependent variable and the level of perceived social support, received social support, formal social support, and informal social support as independent variables for the U.S. sample, controlling for parents' age, family income, and parents' ethnicity. The three covariates (parents' age, family income, and parents' ethnicity) were entered at stage one, and the perceived, received, formal, and informal social support (SSS, ISSB, FSS formal, FSS informal) were entered at stage 2. When the three covariates were entered, they significantly predicted parental stress, $F(3, 53) = 3.96$, $p = .01$, $R^2 = .18$, *adjusted* $R^2 = .14$. The regression weights (Table 16, step1) suggest that, among the three covariates, only the family income contributes significantly to predict parental stress.

When the perceived, received, informal and formal support were added to the analysis, they significantly improved the prediction, R^2 *change* $= .17$, $F(4, 49) = 3.15$, $p = .02$. The entire group of variables significantly predicted parental stress, $F(7, 49) = 3.77$, $p = .002$, $R^2 = .35$,

adjusted R^2 = .26. It was concluded that there was a significant prediction of parental stress by the four types of social support, after controlling for parents' age, family income, and parents' ethnicity. Nevertheless, the regression weights (Table 16, step 2) suggest that only the perceived support contributes significantly to predict parental stress, when entered with the three covariates. Table 16 presents the unstandardized regression coefficients (B), their standard errors (SEB), the standardized regression coefficient (β), the squared semipartial correlations (sr^2), R square, and adjusted R square. The comparison with the Chinese sample is presented in Table 17.

The data met the assumptions of linearity, normality, multicollinearity, homoscedasticity, and outliers, and the influential cases were screened. The VIFs ranged from 1.12 to 2.22, which were lower than 10 and suggested that multicollinearity was not much of concern (Cohen et al., 2003). A scatterplot of standardized residuals against standardized predicted values was generated. Linearity seems to hold because the scatter cloud was around the horizontal line of zero; there was no curvilinear pattern. Homoscedasticity seems to hold because the scatter cloud had approximately constant variability except a couple of outliers; the Breusch-Pagan test (p = .53) was not significant at the 5% level, which also indicated that the error terms were homoscedastic (Breusch & Pagan, 1979). The normal Q-Q plot was generated and suggested approximate normal distribution. The Shapiro-Wilk test with a *p*-value of .28 was not significant at the 5% level, which also suggested that the assumption of normality was satisfied. For a normal distribution, 5% distribution outside of 2 standard deviations was expected. Therefore, having 2 out of 57 subjects (about 4%) fell outside of 2 SD was expected. The studentized deleted residuals and the Leverage values were also performed. For the studentized deleted residuals, no case had a magnitude above 3 and thus no case was of concern (Cohen et al., 2003). For the Leverage values, no case had leverage values greater than .37 (3*7/57) and thus no case

was of concern. The largest Cook's D was .12, which was smaller than 1. Therefore, there were no influential cases in this sample (Cohen et al., 2003).

Table 16. Regression analysis summary for predicting parental stress – U.S. sample, research question 1 (all social support), covariates: parents' age, family income. parents' ethnicity

IVs	B	SEB	β	sr^2	R^2	ΔR^2
Step1						
Parents' Age	-.76	.44	-.22	.04	.18*	
Family Income	-2.56	1.19	-.28*	.07		
Parents' Ethnicity	-2.08	2.77	-.09	.01		
Step 2						
Parents' Age	-.67	.42	-.20	.03	.35*	.17*
Family Income	-1.12	1.24	-.12	.01		
Parents' Ethnicity	-3.13	2.77	-.14	.02		
Perceived Support (SSS)	-1.20	.34	-.60*	.16		
Received Support (ISSB)	.23	.14	.25	.04		
FSS Informal	.29	.29	.15	.01		
FSS Formal	.15	.63	.03	.00		

* $p < .05$

4.6.1.3 Research Question 1 – analysis summary and conclusion

As hypothesized, a significant association was found between parental stress and the four types of social support for the U.S. sample but not for the Chinese sample. Please refer to Table 14.

Table 17. Research Question 1- China and U.S. comparison

IV(s)	DV	China	United States
1. perceived social support 2. received social support 3. formal social support 4. informal social support	parental stress	No covariate R^2 = .08, *adjusted* R^2 = -.02, $F(4, 40) = .84$, $p = .51$ Covariate: family income R^2 *change* = .07, $F(4, 37) = .78$, $p = .55$	No covariate R^2 = .23, *adjusted* R^2 = .17, $F(4, 53) = 4.00$, $p = .01$ Covariates: parents' age, family income, parents' ethnicity R^2 *change* = .17, $F(4, 49) = 3.15$, $p = .02$

4.6.2 Research Question 2: Does the relation between perceived and received social support and parental stress differ for U.S. and Chinese parents?

Hypothesis 2: The present study hypothesized that, for U.S. parents, both received and perceived social support will be associated with lower parental stress levels. In contrast, for Chinese parents, only perceived social support but not received social support will be associated with lower parental stress levels.

4.6.2.1 Chinese sample

A simple linear regression was conducted to investigate how well the perceived social support predicts parental stress in the Chinese sample. The results were not statistically significant $F(1, 43) = 3.21$, $p = .08$, $r = -.26$. The comparison with the U.S. sample is presented in Table 28. The data met the assumptions of linearity, normality, multicollinearity, and homoscedasticity, and the influential cases were screened. The outliers may be of concern in this data set. The VIF was 1, which were lower than 10 and suggested that multicollinearity was not much of concern (Cohen et al., 2003). A scatterplot of standardized residuals against

standardized predicted values was generated. Linearity seems to hold because the scatter cloud was around the horizontal line of zero; there was no curvilinear pattern. Homoscedasticity seems to hold because the scatter cloud had approximately constant variability except a couple of outliers; the Breusch-Pagan test (p = .44) was not significant at the 5% level, which also indicated that the error terms were homoscedastic (Breusch & Pagan, 1979). The normal Q-Q plot was generated and suggested approximate normal distribution. The Shapiro-Wilk test with a p-value of .16 was not significant at the 5% level, which also suggested that the assumption of normality was satisfied. For a normal distribution, 5% distribution outside of 2 standard deviations was expected. Having 5 out of 45 subjects (about 11%) fell outside of 2 SD was higher than expected. The studentized deleted residuals and the Leverage values were also performed. For the studentized deleted residuals, no case had a magnitude above 3 and thus no case was of concern (Cohen et al., 2003). For the Leverage values, 3 cases had leverage values greater than .07 (3*1/45): cases 39, 11, and 3 may be of concern here. The largest Cook's D was .23, which was smaller than 1. Therefore, there were no influential cases in this sample (Cohen et al., 2003).

A two-stage hierarchical multiple regression was performed between parental stress as the dependent variable and the level of perceived social support as the independent variable for the Chinese sample, controlling for family income. The family income was entered at stage one, and the perceived social support (SSS) was entered at stage 2. When the family income was entered, it did not significantly predict parental stress, $F(1, 41) = 2.18$, p = .15, R^2 = .05, *adjusted* R^2 = .03. When the perceived support was added, it did not significantly improve the prediction, R^2 *change* = .05, $F(1, 40) = 2.21$, p = .15. The entire group of variables did not significantly predict parental stress, $F(2, 40) = 2.23$, p = .12, R^2 = .10, *adjusted* R^2 = .06. It was

concluded that there was not a significant prediction of parental stress by the perceived social support, after controlling for family income. Table 18 presents the unstandardized regression coefficients (B), their standard errors (SEB), the standardized regression coefficient (β), the squared semipartial correlations (sr^2), R square, and adjusted R square. The comparison with the U.S. sample is presented in Table 28.

The data met the assumptions of linearity, normality, multicollinearity, and homoscedasticity, and the influential cases were screened. Outliers may be of concern in this data set. The VIFs were 1, which were lower than 10 and suggested that multicollinearity was not much of concern (Cohen et al., 2003). A scatterplot of standardized residuals against standardized predicted values was generated. Linearity seems to hold because the scatter cloud was around the horizontal line of zero; there was no curvilinear pattern. Homoscedasticity seems to hold because the scatter cloud had approximately constant variability except a couple of outliers; the Breusch-Pagan test (p = .66) was not significant at the 5% level, which also indicated that the error terms were homoscedastic (Breusch & Pagan, 1979). The normal Q-Q plot was generated and suggested approximate normal distribution. The Shapiro-Wilk test with a p-value of .41 was not significant at the 5% level, which also suggested that the assumption of normality was satisfied. For a normal distribution, 5% distribution outside of 2 standard deviations was expected. Having 5 out of 45 subjects (about 11%) fell outside of 2 SD was higher than expected. The studentized deleted residuals and the Leverage values were also performed. For the studentized deleted residuals, no case had a magnitude above 3 and thus no case was of concern (Cohen et al., 2003). For the Leverage values, 2 cases had leverage values greater than .13 (3*2/45): cases 42 and 15 may be of concern here. The largest Cook's D was

.18, which was smaller than 1. Therefore, there were no influential cases in this sample (Cohen et al., 2003).

Table 18. Regression analysis summary for predicting parental stress – Chinese sample, perceived support, covariate: family income

IVs	B	SEB	β	sr^2	R^2	ΔR^2
Step1						
Family Income	-.001	.00	-.23	.05	.05	
Step 2						
Family Income	-.001	.00	-.22	.05	.10	.05
Perceived Support (SSS)	-.37	.25	-.22	.05		

A simple linear regression was conducted to investigate how well the received social support predicts parental stress in the Chinese sample. The results were not statistically significant $F(1, 43) = .41$, $p = .50$, $r = -.10$. The comparison with the U.S. sample is presented in Table 28. The data met the assumptions of linearity, normality, multicollinearity, and homoscedasticity, and the influential cases were screened. Outliers may be of concern in this data set. The VIF was 1, which were lower than 10 and suggested that multicollinearity was not much of concern (Cohen et al., 2003). A scatterplot of standardized residuals against standardized predicted values was generated. Linearity seems to hold because the scatter cloud was around the horizontal line of zero; there was no curvilinear pattern. Homoscedasticity seems to hold because the scatter cloud had approximately constant variability except a couple of outliers; the Breusch-Pagan test ($p = .35$) was not significant at the 5% level, which also indicated that the error terms were homoscedastic (Breusch & Pagan, 1979). The normal Q-Q plot was generated and suggested approximate normal distribution. The Shapiro-Wilk test with a p-value of .65 was not significant at the 5% level, which also suggested that the assumption of

normality was satisfied. For a normal distribution, 5% distribution outside of 2 standard deviations was expected. Having 4 out of 45 subjects (about 9%) fell outside of 2 SD was higher than expected. The studentized deleted residuals and the Leverage values were also performed. For the studentized deleted residuals, no case had a magnitude above 3 and thus no case was of concern (Cohen et al., 2003). For the Leverage values, 3 cases had leverage values greater than .07 (3*1/45): cases 39, 23, and 3 may be of concern here. The largest Cook's D was .17, which was smaller than 1. Therefore, there were no influential cases in this sample (Cohen et al., 2003).

A two-stage hierarchical multiple regression was performed between parental stress as the dependent variable and the level of received social support as the independent variable for the Chinese sample, controlling for family income. The family income was entered at stage one, and the received social support (ISSB) was entered at stage 2. When the family income was entered, it did not significantly predict parental stress, $F(1, 41) = 2.18$, $p = .15$, $R^2 = .05$, *adjusted* $R^2 = .03$. When the received support was added, it did not significantly improve the prediction, R^2 *change* $= .001$, $F(1, 40) = .05$, $p = .83$. The entire group of variables did not significantly predict parental stress, $F(2, 40) = 1.09$, $p = .35$, $R^2 = .05$, *adjusted* $R^2 = .004$. It was concluded that there was not a significant prediction of parental stress by the received social support, after controlling for family income. Table 19 presents the unstandardized regression coefficients (B), their standard errors (SEB), the standardized regression coefficient (β), the squared semipartial correlations (sr^2), R square, and adjusted R square. The comparison with the U.S. sample is presented in Table 28.

The data met the assumptions of linearity, normality, multicollinearity, and homoscedasticity, and the influential cases were screened. Outliers may be of concern in this data set. The VIFs were 1.04, which were lower than 10 and suggested that multicollinearity was

not much of concern (Cohen et al., 2003). A scatterplot of standardized residuals against standardized predicted values was generated. Linearity seems to hold because the scatter cloud was around the horizontal line of zero; there was no curvilinear pattern. Homoscedasticity seems to hold because the scatter cloud had approximately constant variability except a couple of outliers; the Breusch-Pagan test (p = .70) was not significant at the 5% level, which also indicated that the error terms were homoscedastic (Breusch & Pagan, 1979). The normal Q-Q plot was generated and suggested approximate normal distribution. The Shapiro-Wilk test with a p-value of .77 was not significant at the 5% level, which also suggested that the assumption of normality was satisfied. For a normal distribution, 5% distribution outside of 2 standard deviations was expected. Having 3 out of 45 subjects (about 7%) fell outside of 2 SD was higher than expected. The studentized deleted residuals and the Leverage values were also performed. For the studentized deleted residuals, no case had a magnitude above 3 and thus no case was of concern (Cohen et al., 2003). For the Leverage values, 2 cases had leverage values greater than .13 (3*2/45): cases 42 and 5 may be of concern here. The largest Cook's D was .19, which was smaller than 1. Therefore, there were no influential cases in this sample (Cohen et al., 2003).

Table 19. Regression analysis summary for predicting parental stress – Chinese sample, received support, covariate: family income

IVs	B	SEB	β	sr^2	R^2	ΔR^2
Step1						
Family Income	-.001	.00	-.23	.05	.05	
Step 2						
Family Income	-.001	.00	-.22	.05	.05	.001
Received Support (ISSB)	-.02	.08	-.04	.00		

A multiple linear regression was performed between parental stress as the dependent variable and the level of perceived social support and received social support as independent variables on the Chinese sample. There was no significant prediction of parental stress by these two types of social support, $F(2, 42) = 1.60$, $p = .21$, $R^2 = .07$, *adjusted* $R^2 = .03$. The regression analysis summary is presented in Table 18, including the unstandardized regression coefficients (B), their standard errors (SEB), their confidence intervals, the standardized regression coefficient (β), and the squared semipartial correlations (sr^2). The comparison with the U.S. sample is presented in Table 28.

The data met the assumptions of linearity, normality, multicollinearity, and homoscedasticity, and the influential cases were screened. Outliers may be of concern in this data set. The VIFs were 1.37, which were lower than 10 and suggested that multicollinearity was not much of concern (Cohen et al., 2003). A scatterplot of standardized residuals against standardized predicted values was generated. Linearity seems to hold because the scatter cloud was around the horizontal line of zero; there was no curvilinear pattern. Homoscedasticity seems to hold because the scatter cloud had approximately constant variability except a couple of outliers; the Breusch-Pagan test ($p = .55$) was not significant at the 5% level, which also indicated that the error terms were homoscedastic (Breusch & Pagan, 1979). The normal Q-Q plot was generated and suggested approximate normal distribution. The Shapiro-Wilk test with a *p*-value of .15 was not significant at the 5% level, which also suggested that the assumption of normality was satisfied. For a normal distribution, 5% distribution outside of 2 standard deviations was expected. Therefore, having 4 out of 45 subjects (about 9%) fell outside of 2 SD was higher than expected. The studentized deleted residuals and the Leverage values were also performed. For the studentized deleted residuals, no case had a magnitude above 3 and thus no

case was of concern (Cohen et al., 2003). For the Leverage values, 1 case had leverage values greater than .13 (3*2/45): case 39 may be of concern. The largest Cook's D was .23, which was smaller than 1. Therefore, there were no influential cases in this sample (Cohen et al., 2003).

Table 20. Regression analysis summary for predicting parental stress – Chinese sample, research question 2 (perceived and received social support), no covariate

IVs	B	SEB	95% CI	β	sr^2
Perceived Support (SSS)	-.47	.28	[-1.01, .10]	-.29	.06
Received Support (ISSB)	.02	.09	[-.16, .21]	.05	.00

A two-stage hierarchical multiple regression was performed between parental stress as the dependent variable and the level of perceived and received social support as independent variables for the Chinese sample, controlling for family income. The family income was entered at stage one, and the perceived support (SSS) and received support (ISSB) were entered at stage 2. When the family income was entered, it did not significantly predict parental stress, $F(1, 41) = 2.18$, $p = .15$, $R^2 = .05$, *adjusted* $R^2 = .03$. When the perceived and received support were added, they did not significantly improve the prediction, R^2 *change* $= .06$, $F(2, 39) = 1.28$, $p = .29$. The entire group of variables did not significantly predict parental stress, $F(3, 39) = 1.59$, $p = .21$, $R^2 = .11$, *adjusted* $R^2 = .04$. It was concluded that there was not a significant prediction of parental stress by the perceived and received social support, after controlling for family income. Table 21 presents the unstandardized regression coefficients (B), their standard errors (SEB), the standardized regression coefficient (β), the squared semipartial correlations (sr^2), R square, and adjusted R square. The comparison with the U.S. sample is presented in Table 28.

The data met the assumptions of linearity, normality, multicollinearity, and homoscedasticity, and the influential cases were screened. Outliers may be of concern in this data set. The VIFs ranged from 1.05 to 1.42, which were lower than 10 and suggested that multicollinearity was not much of concern (Cohen et al., 2003). A scatterplot of standardized residuals against standardized predicted values was generated. Linearity seems to hold because the scatter cloud was around the horizontal line of zero; there was no curvilinear pattern. Homoscedasticity seems to hold because the scatter cloud had approximately constant variability except a couple of outliers; the Breusch-Pagan test (p = .75) was not significant at the 5% level, which also indicated that the error terms were homoscedastic (Breusch & Pagan, 1979). The normal Q-Q plot was generated and suggested approximate normal distribution. The Shapiro-Wilk test with a p-value of .44 was not significant at the 5% level, which also suggested that the assumption of normality was satisfied. For a normal distribution, 5% distribution outside of 2 standard deviations was expected. Therefore, having 2 out of 45 subjects (about 4%) fell outside of 2 SD was expected. The studentized deleted residuals and the Leverage values were also performed. For the studentized deleted residuals, no case had a magnitude above 3 and thus no case was of concern (Cohen et al., 2003). For the Leverage values, 1 case had leverage values greater than .2 (3*3/45): case 5 may be of concern. The largest Cook's D was .22, which was smaller than 1. Therefore, there were no influential cases in this sample (Cohen et al., 2003).

Table 21. Regression analysis summary for predicting parental stress – Chinese sample, research question 2 (perceived and received social support), covariates: family income

IVs	B	SEB	β	sr^2	R^2	ΔR^2
Step1						
Family Income	-.001	.00	-.23	.05	.05	
Step 2						
Family Income	-.001	.00	-.24	.06	.11	.06
Perceived Support (SSS)	-.46	.29	-.28	.06		
Received Support (ISSB)	.06	.09	.11	.01		

4.6.2.2 U.S. sample

A simple linear regression was conducted to investigate how well the perceived social support predicts parental stress for the U.S. sample. The result was statistically significant $F(1, 58) = 11.67$, $p = .001$, $r = -.41$. The comparison with the Chinese sample is presented in Table 28. The data met the assumptions of linearity, normality, multicollinearity, and homoscedasticity, and the influential cases were screened. The outliers may be of concern in this data set. The VIF was 1, which were lower than 10 and suggested that multicollinearity was not much of concern (Cohen et al., 2003). A scatterplot of standardized residuals against standardized predicted values was generated. Linearity seems to hold because the scatter cloud was around the horizontal line of zero; there was no curvilinear pattern. Homoscedasticity seems to hold because the scatter cloud had approximately constant variability except a couple of outliers; the Breusch-Pagan test ($p = .74$) was not significant at the 5% level, which also indicated that the error terms were homoscedastic (Breusch & Pagan, 1979). The normal Q-Q plot was generated and suggested approximate normal distribution. The Shapiro-Wilk test with a *p*-value of .23 was not significant at the 5% level, which also suggested that the assumption of normality was satisfied. For a

normal distribution, 5% distribution outside of 2 standard deviations was expected. Having 2 out of 59 subjects (about 3%) fell outside of 2 SD was expected. The studentized deleted residuals and the Leverage values were also performed. For the studentized deleted residuals, no case had a magnitude above 3 and thus no case was of concern (Cohen et al, 2003). For the Leverage values, 5 cases had leverage values greater than .05 (3*1/59): cases 2, 56, 36, 35, and 18 may be of concern here. The largest Cook's D was .18, which was smaller than 1. Therefore, there were no influential cases in this sample (Cohen et al., 2003).

A two-stage hierarchical multiple regression was performed between parental stress as the dependent variable and the level of perceived social support as the independent variable for the U.S. sample, controlling for parents' age, family income, and parents' ethnicity. The three covariates (parents' age, family income, and parents' ethnicity) were entered at stage one, and the perceived social support (SSS) was entered at stage 2. When the three covariates were entered, they significantly predicted parental stress, $F(3, 53) = 3.96$, $p = .01$, $R^2 = .18.$, *adjusted* $R^2 = .14$. When the perceived support was added, it significantly improved the prediction, R^2 *change* = .11, $F(1, 52) = 7.96$, $p = .01$. The entire group of variables significantly predicted parental stress, $F(4, 52) = 5.35$, $p = .001$, $R^2 = .29$, *adjusted* $R^2 = .24$. It was concluded that there was a significant prediction of parental stress by the perceived social support, after controlling for parents' age, family income, and parents' ethnicity. Table 22 presents the unstandardized regression coefficients (B), their standard errors (SEB), the standardized regression coefficient (β), the squared semipartial correlations (sr^2), R square, and adjusted R square. The comparison with the Chinese sample is presented in Table 28.

The data met the assumptions of linearity, normality, multicollinearity, and homoscedasticity, and the influential cases were screened. Outliers may be of concern in this

data set. The VIFs ranged from 1.03 to 1.24, which were lower than 10 and suggested that multicollinearity was not much of concern (Cohen et al., 2003). A scatterplot of standardized residuals against standardized predicted values was generated. Linearity seems to hold because the scatter cloud was around the horizontal line of zero; there was no curvilinear pattern. Homoscedasticity seems to hold because the scatter cloud had approximately constant variability except a couple of outliers; the Breusch-Pagan test (p = .39) was not significant at the 5% level, which also indicated that the error terms were homoscedastic (Breusch & Pagan, 1979). The normal Q-Q plot was generated and suggested approximate normal distribution. The Shapiro-Wilk test with a p-value of .67 was not significant at the 5% level, which also suggested that the assumption of normality was satisfied. For a normal distribution, 5% distribution outside of 2 standard deviations was expected. Having 1 out of 57 subjects (about 2%) fell outside of 2 SD was expected. The studentized deleted residuals and the Leverage values were also performed. For the studentized deleted residuals, no case had a magnitude above 3 and thus no case was of concern (Cohen et al., 2003). For the Leverage values, 4 cases had leverage values greater than .21 (3*4/57): cases 56, 16, 23, and 2 may be of concern here. The largest Cook's D was .09, which was smaller than 1. Therefore, there were no influential cases in this sample (Cohen et al., 2003).

Table 22. Regression analysis summary for predicting parental stress – U.S. sample, perceived support, covariates: parents' age, family income, parents' ethnicity

IVs	B	SEB	β	sr^2	R^2	ΔR^2
Step1						
Parents' Age	-.76	.44	-.22	.04	.18*	
Family Income	-2.56	1.19	-.28*	.07		
Parents' Ethnicity	-2.08	2.77	-.09	.01		
Step 2						
Parents' Age	-.75	.42	-.22	.04	.29*	.11*
Family Income	-1.45	1.19	-.16	.02		
Parents' Ethnicity	-2.52	2.61	-.11	.01		
Perceived Support (SSS)	-.70	.25	-.35*	.11		

* $p < .05$

A simple linear regression was conducted to investigate how well the received social support predicts parental stress in the U.S. sample. The results were not statistically significant $F(1, 57) = .07$, $p = .79$, $r = -.04$. The comparison with the Chinese sample is presented in Table 28. The data met the assumptions of linearity, normality, multicollinearity, and homoscedasticity, and the influential cases were screened. Outliers may be of concern in this data set. The VIF was 1, which were lower than 10 and suggested that multicollinearity was not much of concern (Cohen et al., 2003). A scatterplot of standardized residuals against standardized predicted values was generated. Linearity seems to hold because the scatter cloud was around the horizontal line of zero; there was no curvilinear pattern. Homoscedasticity seems to hold because the scatter cloud had approximately constant variability except a couple of outliers; the Breusch-Pagan test ($p = .62$) was not significant at the 5% level, which also indicated that the error terms were homoscedastic (Breusch & Pagan, 1979). The normal Q-Q plot was generated and suggested approximate normal distribution. The Shapiro-Wilk test with a *p*-value of .06 was not significant at the 5% level, which also suggested that the assumption of normality was satisfied. For a

normal distribution, 5% distribution outside of 2 standard deviations was expected. Having 3 out of 58 subjects (about 5%) fell outside of 2 SD was expected. The studentized deleted residuals and the Leverage values were also performed. For the studentized deleted residuals, no case had a magnitude above 3 and thus no case was of concern (Cohen et al., 2003). For the Leverage values, 6 cases had leverage values greater than .05 (3*1/58): cases 19, 46, 41, 27, 55, and 1 may be of concern here. The largest Cook's D was .07, which was smaller than 1. Therefore, there were no influential cases in this sample (Cohen et al., 2003).

A two-stage hierarchical multiple regression was performed between parental stress as the dependent variable and the level of received social support as the independent variable for the U.S. sample, controlling for parents' age, family income, and parents' ethnicity. The three covariates (parents' age, family income, and parents' ethnicity) were entered at stage one, and the received social support (ISSB) was entered at stage 2. When the three covariates were entered, they significantly predicted parental stress, $F(3, 53) = 3.96$, $p = .01$, $R^2 = .18.$, *adjusted* $R^2 = .14$. When the received support was added, it did not significantly improve the prediction, R^2 *change* $= .002$, $F(1, 52) = .11$, $p = .74$. The entire group of variables significantly predicted parental stress, $F(4, 52) = 2.95$, $p = .03$, $R^2 = .19$, *adjusted* $R^2 = .12$. It was concluded that there was not a significant prediction of parental stress by the received social support, after controlling for parents' age, family income, and parents' ethnicity. Table 23 presents the unstandardized regression coefficients (B), their standard errors (SEB), the standardized regression coefficient (β), the squared semipartial correlations (sr^2), R square, and adjusted R square. The comparison with the Chinese sample is presented in Table 28.

The data met the assumptions of linearity, normality, multicollinearity, and homoscedasticity, and the influential cases were screened. Outliers may be of concern in this

data set. The VIFs ranged from 1.03 to 1.10, which were lower than 10 and suggested that multicollinearity was not much of concern (Cohen et al., 2003). A scatterplot of standardized residuals against standardized predicted values was generated. Linearity seems to hold because the scatter cloud was around the horizontal line of zero; there was no curvilinear pattern. Homoscedasticity seems to hold because the scatter cloud had approximately constant variability except a couple of outliers; the Breusch-Pagan test (p = .40) was not significant at the 5% level, which also indicated that the error terms were homoscedastic (Breusch & Pagan, 1979). The normal Q-Q plot was generated and suggested approximate normal distribution. The Shapiro-Wilk test with a p-value of .33 was not significant at the 5% level, which also suggested that the assumption of normality was satisfied. For a normal distribution, 5% distribution outside of 2 standard deviations was expected. Having 3 out of 57 subjects (about 5%) fell outside of 2 SD was expected. The studentized deleted residuals and the Leverage values were also performed. For the studentized deleted residuals, no case had a magnitude above 3 and thus no case was of concern (Cohen et al., 2003). For the Leverage values, 4 cases had leverage values greater than .21 (3*4/57): cases 56, 16, 23, and 55 were of concern here. The largest Cook's D was .10, which was smaller than 1. Therefore, there were no influential cases in this sample (Cohen et al., 2003).

Table 23. Regression analysis summary for predicting parental stress – U.S. sample, received support, covariates: parents' age, family income, parents' ethnicity

IVs	B	SEB	β	sr^2	R^2	ΔR^2
Step1						
Parents' Age	-.76	.44	-.22	.04	.183*	
Family Income	-2.56	1.19	-.28*	.07		
Parents' Ethnicity	-2.08	2.77	-.09	.01		
Step 2						
Parents' Age	-.77	.45	-.23	.05	.185*	.002
Family Income	-2.55	1.20	-.28*	.07		
Parents' Ethnicity	-2.16	2.81	-.10	.01		
Received Support (ISSB)	-.04	.12	-.04	.00		

* $p < .05$

A multiple linear regression was performed between parental stress as the dependent variable and the level of perceived social support and received social support as independent variables on the U.S. sample. There was a significant prediction of parental stress by these two types of social support, $F(2, 56) = 8.09$, $p = .001$, $R^2 = .22$, *adjusted* $R^2 = .19$. Both perceived and received social support contributed significantly to prediction of parental stress. The regression analysis summary is presented in Table 24, including the unstandardized regression coefficients (B), their standard errors (SEB), their confidence intervals, the standardized regression coefficient (β), and the squared semipartial correlations (sr^2). The comparison with the Chinese sample is presented in Table 28.

The data met the assumptions of linearity, normality, multicollinearity, and homoscedasticity, and the influential cases were screened. Outliers may be of concern in this data set. The VIFs were 1.47, which were lower than 10 and suggested that multicollinearity was not much of concern (Cohen et al., 2003). A scatterplot of standardized residuals against standardized predicted values was generated. Linearity seems to hold because the scatter cloud was around the horizontal line of zero; there was no curvilinear pattern. Homoscedasticity seems

to hold because the scatter cloud had approximately constant variability except a couple of outliers; the Breusch-Pagan test (p = .78) was not significant at the 5% level, which also indicated that the error terms were homoscedastic (Breusch & Pagan, 1979). The normal Q-Q plot was generated and suggested approximate normal distribution. The Shapiro-Wilk test with a p-value of .49 was not significant at the 5% level, which also suggested that the assumption of normality was satisfied. For a normal distribution, 5% distribution outside of 2 standard deviations was expected. Therefore, having 3 out of 58 subjects (about 5%) fell outside of 2 SD was expected. The studentized deleted residuals and the Leverage values were also performed. For the studentized deleted residuals, 1 case had a magnitude above 3: case 44 may be of concern (Cohen et al., 2003). For the Leverage values, 1 case had leverage values greater than .10 (3*2/58): case 19 may be of concern. The largest Cook's D was .15, which was smaller than 1. Therefore, there were no influential cases in this sample (Cohen et al., 2003).

Table 24. Regression analysis summary for predicting parental stress – U.S. sample, research question 2 (perceived and received social support), no covariate

IVs	B	SEB	95% CI	β	sr^2
Perceived Stress (SSS)	-1.12*	.28	[-1.67, -.56]	-.57	.22
Received Stress (ISSB)	.26*	.13	[.002, .52]	.29	.06

* $p < .05$

A two-stage hierarchical multiple regression was performed between parental stress as the dependent variable and the level of perceived and received social support as the independent variables for the U.S. sample, controlling for parents' age, family income, and parents' ethnicity.

The three covariates (parents' age, family income, and parents' ethnicity) were entered at stage one, and the perceived support (SSS) and received support (ISSB) were entered at stage 2. When the three covariates were entered, they significantly predicted parental stress, $F(3, 53) = 3.96$, $p = .01$, $R^2 = .18.$, *adjusted* $R^2 = .14$. When the perceived and received support were added, they significantly improved the prediction, R^2 *change* $= .15$, $F(2, 51) = 5.88$, $p = .01$. The entire group of variables significantly predicted parental stress, $F(5, 51) = 5.17$, $p = .001$, $R^2 = .34$, *adjusted* $R^2 = .27$. It was concluded that there a significant prediction of parental stress by the perceived and received social support, after controlling for parents' age, family income, and parents' ethnicity. However, the regression weights (Table 25) suggest that only the perceived but not received support contribute significantly to predict parental stress, when entered with the three covariates. Table 25 presents the unstandardized regression coefficients (B), their standard errors (SEB), the standardized regression coefficient (β), the squared semipartial correlations (sr^2), R square, and adjusted R square. The comparison with the Chinese sample is presented in Table 28.

The data met the assumptions of linearity, normality, multicollinearity, and homoscedasticity, and the influential cases were screened. Outliers may be of concern in this data set. The VIFs ranged from 1.03 to 1.86, which were lower than 10 and suggested that multicollinearity was not much of concern (Cohen et al., 2003). A scatterplot of standardized residuals against standardized predicted values was generated. Linearity seems to hold because the scatter cloud was around the horizontal line of zero; there was no curvilinear pattern. Homoscedasticity seems to hold because the scatter cloud had approximately constant variability except a couple of outliers; the Breusch-Pagan test ($p = .56$) was not significant at the 5% level, which also indicated that the error terms were homoscedastic (Breusch & Pagan, 1979). The normal Q-Q plot was generated and suggested approximate normal distribution. The Shapiro-

Wilk test with a *p*-value of .55 was not significant at the 5% level, which also suggested that the assumption of normality was satisfied. For a normal distribution, 5% distribution outside of 2 standard deviations was expected. Therefore, having 2 out of 57 subjects (about 4%) fell outside of 2 SD was expected. The studentized deleted residuals and the Leverage values were also performed. For the studentized deleted residuals, no case had a magnitude above 3 and thus no case was of concern (Cohen et al., 2003). For the Leverage values, 2 case had leverage values greater than .26 (3*5/57); cases 56 and 16 may be of concern. The largest Cook's D was .07, which was smaller than 1. Therefore, there were no influential cases in this sample (Cohen et al., 2003).

Table 25. Regression analysis summary for predicting parental stress – U.S. sample, Research Question 2 (perceived and received social support), covariates: parents' age, family income. parents' ethnicity

IVs	B	SEB	β	sr^2	R^2	ΔR^2
Step1						
Parents' Age	-.76	.44	-.22	.04	.18*	
Family Income	-2.56	1.19	-.28*	.07		
Parents' Ethnicity	-2.08	2.77	-.09	.01		
Step 2						
Parents' Age	-.65	.41	-.19	.03	.34*	.15*
Family Income	-.92	1.20	-.10	.01		
Parents' Ethnicity	-2.22	2.56	-.10	.01		
Perceived Support (SSS)	-1.06	.31	-.53*	.15		
Received Support (ISSB)	.25	.14	.27	.04		

* $p < .05$

4.6.2.3 Research Question 2 – analysis summary and conclusion

Table 26. Pearson correlations between SSS individual items and PSI-SF total score

	SSS Items	PSI-SF Total Chinese sample (n = 45)	PSI-SF Total U.S. sample (n = 60)
1	I participate in volunteer/service projects.	-.27	.07
2	I have meaningful conversations with my parents and/or siblings.	-.10	-.37*
3	I have a mentor(s) in my life I can go to for support/advice.	-.06	-.08
4	I seldom invite others to join me in my social and/or recreational activities.	-.13	-.19
5	There is at least one person I feel a strong emotional tie with.	.01	-.29*
6	There is no one I can trust to help solve my problems.	-.08	-.21
7	I take time to visit with my neighbors.	-.31*	-.21
8	If a crisis arose in my life, I would have the support I need from family and/or friends.	-.11	-.43*
9	I belong to a club (e.g. sports, hobbies, support group, special interests).	-.22	-.10
10	I have friends from school that I see socially (e.g. movie dinner, sports, etc.).	-.24	-.19
11	I have friendships that are mutually fulfilling.	-.10	-.13
12	There is no one I can talk to when making important decisions in my life.	-.27	-.29*
13	I make an effort to keep in touch with friends.	-.12	-.05

Table 26 (continued)

14	My friends and family feel comfortable asking me for help.	.08	-.34*
15	I find it difficult to make new friends.	-.10	-.32*
16	I look for opportunities to help and support others.	-.20	-.19
17	I have a close friend(s) whom I feel comfortable sharing deeply about myself.	-.09	-.09
18	I seldom get invited to do things with others.	.05	-.41*
19	I feel well supported by my friends and/or family.	-.12	-.42*
20	I wish I had more people in my life that enjoy the same interests and activities as I do.	.01	-.30*
21	There is no one that shares my beliefs and attitudes.	-.20	-.33*

* $p < .05$

Table 27. Correlations between ISSB individual items and PSI-SF total score

	ISSB Items	PSI-SF Total Chinese sample (N = 45)	PSI-SF Total U.S. sample (N = 59)
	Rate the frequency of the following events. How often in the PAST MONTH you used the support that…		
1	Looked after a family member when you were away.	.16	-.17
2	Was right there with you (physically) in a stressful situation.	-.04	-.11
3	Provided you with a place where you could get away for awhile.	-.09	-.06
4	Told you what she/he did in a situation that was similar to yours.	-.02	-.02
5	Did some activity together to help you get your mind off of things.	-.01	-.04
6	Did some activity together to help you get your mind off of things.	-.17	.04
7	Talked with you about some interests of yours.	-.32*	-.10
8	Let you know that you did something well.	-.32*	-.12
9	Went with you to someone who could take action.	-.17	-.05
10	Told you that you are OK just the way you are.	-.13	-.07
11	Told you that she/he would keep the things that you talk about private-just between the two of you	-.00	-.03
12	Assisted you in setting a goal for yourself	-.21	-.20
13	Made it clear what was expected of you.	-.21	.21
14	Expressed esteem or respect for a competency or personal quality of yours.	-.12	-.11
15	Gave you some information on how to do something.	-.07	.00
16	Suggested some action that you should take.	.06	.02
17	Gave you over $25.	.13	-.03
18	Comforted you by showing you some physical affection.	-.08	-.14
19	Gave you some information to help you understand a situation you were in.	-.10	.27*

Table 27 (continued)

20	Provided you with some transportation.	.02	.03
21	Checked back with you to see if you followed the advice you were given.	-.03	.04
22	Gave you under $25.	-.02	.08
23	Helped you understand why you didn't do something well.	-.33*	.10
24	Listened to you talk about your private feelings.	-.05	-.02
25	Loaned or gave you something (a physical object other than money) that you needed.	.01	-.06
26	Agreed that what you wanted to do was right.	.03	-.14
27	Said things that made your situation clearer and easier to understand.	-.00	-.07
28	Told you how he/she felt in a situation that was similar to yours.	-.06	-.10
29	Let you know that he/she will always be around if you need assistance.	.03	.05
30	Expressed interest and concern in your well-being.	.00	.08
31	Told you that she/he feels very close to you.	-.01	.01
32	Told you who you should see for assistance.	-.18	-.11
33	Told you what to expect in a situation that was about to happen.	-.17	-.08
34	Loaned you over $25	-.09	.20
35	Taught you how to do something.	-.15	.18
36	Gave you feedback on how you were doing without saying it was good or bad.	.02	-.03
37	Joked and kidded to try to cheer you up.	-.07	.10
38	Provided you with a place to stay.	-.02	.19
39	Pitched in to help you do something that needed to be done.	.11	-.16
40	Loaned you under $25.	-.14	.09

* $p < .05$

Table 28. Research Question 2- China and U.S. comparison

IV(s)	DV	China	United States
1. perceived social support	parental stress	No covariate r = -.26 , r^2 =.07, F(1, 43) = 3.21, p = .08 Covariate: family income R^2 *change* = .05, F(1, 40) = 2.21, p = .15	No covariate r = -.41, r^2 =.17, F(1, 58) = 11.67, p = .001 Covariate: parents' age, family income, parents' ethnicity R^2 *change* = .11, F(1, 52) = 7.96, p = .01
1. received social support	parental stress	No covariate r = -.10, r^2 = .01, F(1, 43) = .41, p = .50 Covariate: family income R^2 *change* = .001, F(1, 40) = .05, p = .83	No covariate r = -.04 , r^2 = 001, F(1, 57) = .07, p = .79 Covariate: parents' age, family income, parents' ethnicity R^2 *change* = .002, F(1, 52) = .11, p = .74
		No covariate There was not a significant difference between how perceived and received support related to parental stress: $t_{\alpha = .05,\ df = 42,\ two\text{-}tailed}$ = -1.10	No covariate There was a significant difference between how perceived and received support related to parental stress: $t_{\alpha = .05,\ df = 56,\ two\text{-}tailed}$ = -3.39
1. perceived social support 2. received social support	parental stress	No covariate R^2 = .07, *adjusted* R^2 = .03, F(2, 42) = 1.60, p = .21 Covariate: family income R^2 *change* = .06, F(2, 39) = 1.28, p = .29	No covariate R^2 = .22, *adjusted* R^2 = .19, F(2, 56) = 8.09, p = .001 Covariate: parents' age, family income, parents' ethnicity R^2 *change* = .15, F(2, 51) = 5.88, p = .01

This hypothesis was partially supported. As hypothesized, the perceived social support was associated with lower parental stress for the U.S. parents; nevertheless, the received support did not show significant association with lower parental stress. For the Chinese sample, neither perceived nor received social support were significantly associated with lower parental stress. There are no common statistical methods to compare the effect size (R^2) of two independent samples.

The major items within the perceived support scale (SSS) that had significant correlation with parental stress were item 7 in the Chinese sample and items 2, 5, 8, 12, 14, 15, 18, 19, 20 21 in the U.S. sample. Please find details in Table 26. The major items within the received support scale (ISSB) that had significant correlation with parental stress were items 7, 8, 23 in the Chinese sample and item 19 in the U.S. sample. Please see Table 27 for details.

4.6.3 Research Question 3: Does the relation between formal and informal social support and parental stress differ for U.S. and Chinese parents?

Hypothesis 3: The present study hypothesized that both formal and informal social support will be associated with lower parental stress among both U.S. and Chinese parents.

4.6.3.1 Chinese sample

A simple linear regression was conducted to investigate how well the informal social support predicts parental stress in the Chinese sample. The result was not statistically significant $F(1, 43) = .44$, $p = .51$, $r = -.10$. The comparison with the U.S. sample is presented in Table 38. The data met the assumptions of linearity, normality, multicollinearity, and homoscedasticity, and the influential cases were screened. The outliers may be of concern in this data set. The VIF

was 1, which were lower than 10 and suggested that multicollinearity was not much of concern (Cohen et al., 2003). A scatterplot of standardized residuals against standardized predicted values was generated. Linearity seems to hold because the scatter cloud was around the horizontal line of zero; there was no curvilinear pattern. Homoscedasticity seems to hold because the scatter cloud had approximately constant variability except a couple of outliers; the Breusch-Pagan test (p = .84) was not significant at the 5% level, which also indicated that the error terms were homoscedastic (Breusch & Pagan, 1979). The normal Q-Q plot was generated and suggested approximate normal distribution. The Shapiro-Wilk test with a p-value of .60 was not significant at the 5% level, which also suggested that the assumption of normality was satisfied. For a normal distribution, 5% distribution outside of 2 standard deviations was expected. Having 4 out of 45 subjects (about 9%) fell outside of 2 SD was higher than expected. The studentized deleted residuals and the Leverage values were also performed. For the studentized deleted residuals, no case had a magnitude above 3 and thus no case was of concern (Cohen et al., 2003). For the Leverage values, 5 cases had leverage values greater than .07 (3*1/45): cases 27, 15, 26, 44, and 23 may be of concern here. The largest Cook's D was .31, which was smaller than 1. Therefore, there were no influential cases in this sample (Cohen et al., 2003).

A two-stage hierarchical multiple regression was performed between parental stress as the dependent variable and the level of informal social support as the independent variable for the Chinese sample, controlling for family income. The family income was entered at stage one, and the informal social support (FSS-informal) was entered at stage 2. When the family income was entered, it did not significantly predict parental stress, $F(1, 41) = 2.18$, $p = .15$, $R^2 = .05$, *adjusted* $R^2 = .03$. When the informal support was added, it did not significantly improve the prediction, R^2 *change* = .004, $F(1, 40) = .18$, $p = .67$. The entire group of variables did not

significantly predict parental stress, $F(2, 40) = 1.16$, $p = .33$, $R^2 = .06$, *adjusted* $R^2 = .01$. It was concluded that there was not a significant prediction of parental stress by the informal social support, after controlling for family income. Table 29 presents the unstandardized regression coefficients (B), their standard errors (SEB), the standardized regression coefficient (β), the squared semipartial correlations (sr^2), R square, and adjusted R square. The comparison with the U.S. sample is presented in Table 38.

The data met the assumptions of linearity, normality, multicollinearity, and homoscedasticity, and the influential cases were screened. Outliers may be of concern in this data set. The VIFs were 1, which were lower than 10 and suggested that multicollinearity was not much of concern (Cohen et al., 2003). A scatterplot of standardized residuals against standardized predicted values was generated. Linearity seems to hold because the scatter cloud was around the horizontal line of zero; there was no curvilinear pattern. Homoscedasticity seems to hold because the scatter cloud had approximately constant variability except a couple of outliers; the Breusch-Pagan test ($p = .98$) was not significant at the 5% level, which also indicated that the error terms were homoscedastic (Breusch & Pagan, 1979). The normal Q-Q plot was generated and suggested approximate normal distribution. The Shapiro-Wilk test with a *p*-value of .74 was not significant at the 5% level, which also suggested that the assumption of normality was satisfied. For a normal distribution, 5% distribution outside of 2 standard deviations was expected. Having 3 out of 45 subjects (about 6%) fell outside of 2 SD was higher than expected. The studentized deleted residuals and the Leverage values were also performed. For the studentized deleted residuals, no case had a magnitude above 3 and thus no case was of concern (Cohen et al., 2003). For the Leverage values, 3 cases had leverage values greater than

.133 (3*2/45): cases 5, 27, and 42 were of concern here. The largest Cook's D was .19, which was smaller than 1. Therefore, there were no influential cases in this sample (Cohen et al., 2003).

Table 29. Regression analysis summary for predicting parental stress – Chinese sample, informal support, covariate: family income

IVs	B	SEB	β	sr^2	R^2	ΔR^2
Step1						
Family Income	-.001	.00	-.23	.05	.05	
Step 2						
Family Income	-.001	.00	-.23	.05	.055	.004
Informal Support (FSS-informal)	-.11	.26	-.07	.00		

A simple linear regression was conducted to investigate how well the formal social support predicts parental stress in the Chinese sample. The results were not statistically significant $F(1, 43) = .30$, $p = .86$, $r = .03$. The comparison with the U.S. sample is presented in Table 38. The data met the assumptions of linearity, normality, multicollinearity, and homoscedasticity, and the influential cases were screened. The outliers may be of concern in this data set. The VIF was 1, which were lower than 10 and suggested that multicollinearity was not much of concern (Cohen et al., 2003). A scatterplot of standardized residuals against standardized predicted values was generated. Linearity seems to hold because the scatter cloud was around the horizontal line of zero; there was no curvilinear pattern. Homoscedasticity seems to hold because the scatter cloud had approximately constant variability except a couple of outliers; the Breusch-Pagan test ($p = .67$) was not significant at the 5% level, which also indicated that the error terms were homoscedastic (Breusch & Pagan, 1979). The normal Q-Q plot was generated and suggested approximate normal distribution. The Shapiro-Wilk test with a

p-value of .64 was not significant at the 5% level, which also suggested that the assumption of normality was satisfied. For a normal distribution, 5% distribution outside of 2 standard deviations was expected. Having 4 out of 45 subjects (about 9%) fell outside of 2 SD was higher than expected. The studentized deleted residuals and the Leverage values were also performed. For the studentized deleted residuals, no case had a magnitude above 3 and thus no case was of concern (Cohen et al., 2003). For the Leverage values, 5 cases had leverage values greater than .07 (3*1/45): cases 20, 4, 35, 37, and 33 may be of concern here. The largest Cook's D was .19, which was smaller than 1; therefore, there were no influential cases in this sample (Cohen et al., 2003).

A two-stage hierarchical multiple regression was performed between parental stress as the dependent variable and the level of formal social support as the independent variable for the Chinese sample, controlling for family income. The family income was entered at stage one, and the formal social support (FSS-formal) was entered at stage 2. When the family income was entered, it did not significantly predict parental stress, $F(1, 41) = 2.18$, $p = .15$, $R^2 = .05$, *adjusted* $R^2 = .03$. When the formal support was added, it did not significantly improve the prediction, R^2 *change* $= .01$, $F(1, 40) = .50$, $p = .49$. The entire group of variables did not significantly predict parental stress, $F(2, 40) = 1.32$, $p = .28$, $R^2 = .06$, *adjusted* $R^2 = .02$. It was concluded that there was not a significant prediction of parental stress by the formal social support, after controlling for family income. Table 30 presents the unstandardized regression coefficients (B), their standard errors (SEB), the standardized regression coefficient (β), the squared semipartial correlations (sr^2), R square, and adjusted R square. The comparison with the U.S. sample is presented in Table 38.

The data met the assumptions of linearity, normality, multicollinearity, and homoscedasticity, and the influential cases were screened. Outliers may be of concern in this data set. The VIFs were 1, which were lower than 10 and suggested that multicollinearity was not much of concern (Cohen et al., 2003). A scatterplot of standardized residuals against standardized predicted values was generated. Linearity seems to hold because the scatter cloud was around the horizontal line of zero; there was no curvilinear pattern. Homoscedasticity seems to hold because the scatter cloud had approximately constant variability except a couple of outliers; the Breusch-Pagan test (p = .91) was not significant at the 5% level, which also indicated that the error terms were homoscedastic (Breusch & Pagan, 1979). The normal Q-Q plot was generated and suggested approximate normal distribution. The Shapiro-Wilk test with a p-value of .80 was not significant at the 5% level, which also suggested that the assumption of normality was satisfied. For a normal distribution, 5% distribution outside of 2 standard deviations was expected. Having 3 out of 45 subjects (about 7%) fell outside of 2 SD was higher than expected. The studentized deleted residuals and the Leverage values were also performed. For the studentized deleted residuals, no case had a magnitude above 3 and thus no case was of concern (Cohen et al., 2003). For the Leverage values, 4 cases had leverage values greater than .13 (3*2/45): cases 5, 20, 42 and 5 may be of concern here. The largest Cook's D was .11, which was smaller than 1. Therefore, there were no influential cases in this sample (Cohen et al., 2003).

Table 30. Regression analysis summary for predicting parental stress – Chinese sample, formal support, covariate: family income

IVs	B	SEB	β	sr^2	R^2	ΔR^2
Step1						
Family Income	-.001	.00	-.23	.05	.05	
Step 2						
Family Income	-.001	.00	-.22	.05	.06	.01
Formal Support (FSS-formal)	.34	.48	.11	.01		

A multiple linear regression was performed between parental stress as the dependent variable and the level of informal social support and formal social support as independent variables on the Chinese sample. There was no significant prediction, $F(2, 42) = .33$, $p = .72$, $R^2 = .02$, *adjusted* $R^2 = -.03$. The regression analysis summary is presented in Table 31, including the unstandardized regression coefficients (B), their standard errors (SEB), their confidence intervals, the standardized regression coefficient (β), and the squared semipartial correlations (sr^2). The comparison with the U.S. sample is presented in Table 38.

The data met the assumptions of linearity, normality, multicollinearity, and homoscedasticity, and the influential cases were screened. Outliers may be of concern in this data set. The VIFs were 1.20, which were lower than 10 and suggested that multicollinearity was not much of concern (Cohen et al., 2003). A scatterplot of standardized residuals against standardized predicted values was generated. Linearity seems to hold because the scatter cloud was around the horizontal line of zero; there was no curvilinear pattern. Homoscedasticity seems to hold because the scatter cloud had approximately constant variability except a couple of outliers; the Breusch-Pagan test ($p = .78$) was not significant at the 5% level, which also indicated that the error terms were homoscedastic (Breusch & Pagan, 1979). The normal Q-Q

plot was generated and suggested approximate normal distribution. The Shapiro-Wilk test with a *p*-value of .69 was not significant at the 5% level, which also suggested that the assumption of normality was satisfied. For a normal distribution, 5% distribution outside of 2 standard deviations was expected. Therefore, having 4 out of 45 subjects (about 9%) fell outside of 2 SD was higher than expected. The studentized deleted residuals and the Leverage values were also performed. For the studentized deleted residuals, no case had a magnitude above 3 and thus no case was of concern (Cohen et al., 2003). For the Leverage values, 2 cases had leverage values greater than .13 (3*2/45): cases 27 and 20 may be of concern. The largest Cook's D was .20, which was smaller than 1; therefore, there were no influential cases in this sample (Cohen et al., 2003).

Table 31. Regression analysis summary for predicting parental stress – Chinese sample, research question 3 (informal and formal social support), no covariate

IVs	B	SEB	95% CI	β	sr^2
FSS Informal	-.23	.28	[-.79, .34]	-.13	.00
FSS Formal	.24	.50	[-.76, 1.25]	.08	.01

A two-stage hierarchical multiple regression was performed between parental stress as the dependent variable and the level of informal and formal social support as the independent variables for the Chinese sample, controlling for family income. The family income was entered at stage one, and the informal and formal social support (FSS) were entered at stage 2. When the family income was entered, it did not significantly predict parental stress, $F(1, 41) = 2.18$, $p = .15$, $R^2 = .05$, *adjusted* $R^2 = .03$. When the informal and formal support were added, they did not significantly improve the prediction, R^2 *change* $= .02$, $F(2, 39) = .51$, $p = .60$. The entire group of variables did not significantly predict parental stress, $F(3, 39) = 1.05$, $p = .38$, $R^2 = .08$,

adjusted R^2 = .003. It was concluded that there was not a significant prediction of parental stress by the informal and formal social support, after controlling for family income. Table 32 presents the unstandardized regression coefficients (B), their standard errors (SEB), the standardized regression coefficient (β), the squared semipartial correlations (sr^2), R square, and adjusted R square. The comparison with the U.S. sample is presented in Table 38.

The data met the assumptions of linearity, normality, multicollinearity, and homoscedasticity, and the influential cases were screened. Outliers may be of concern in this data set. The VIFs ranged from 1.00 to 1.15, which were lower than 10 and suggested that multicollinearity was not much of concern (Cohen et al., 2003). A scatterplot of standardized residuals against standardized predicted values was generated. Linearity seems to hold because the scatter cloud was around the horizontal line of zero; there was no curvilinear pattern. Homoscedasticity seems to hold because the scatter cloud had approximately constant variability except a couple of outliers; the Breusch-Pagan test (p = .89) was not significant at the 5% level, which also indicated that the error terms were homoscedastic (Breusch & Pagan, 1979). The normal Q-Q plot was generated and suggested approximate normal distribution. The Shapiro-Wilk test with a p-value of .83 was not significant at the 5% level, which also suggested that the assumption of normality was satisfied. For a normal distribution, 5% distribution outside of 2 standard deviations was expected. Therefore, having 3 out of 45 subjects (about 6%) fell outside of 2 SD was higher than expected. The studentized deleted residuals and the Leverage values were also performed. For the studentized deleted residuals, no case had a magnitude above 3 and thus no case was of concern (Cohen et al., 2003). For the Leverage values, 2 cases had leverage values greater than .2 (3*3/45): cases 27 and 5 may be of concern. The largest Cook's D was .14,

which was smaller than 1; therefore, there were no influential cases in this sample (Cohen et al., 2003).

Table 32. Regression analysis summary for predicting parental stress – Chinese sample, Research Question 3 (informal and formal social support), covariate: family income

IVs	B	SEB	β	sr^2	R^2	ΔR^2
Step1						
Family Income	-.001	.00	-.23	.05	.05	
Step 2						
Family Income	-.001	.00	-.23	.05	.075	.024
Informal Support (FSS-informal)	-.20	.28	-.12	.01		
Formal Support (FSS-formal)	.48	.52	.15	.02		

4.6.3.2 U.S. sample

A simple linear regression was conducted to investigate how well the informal social support predicts parental stress in the U.S. sample. The results were not statistically significant $F(1, 56) = 1.61$, $p = .21$, $r = -.17$. The comparison with the Chinese sample is presented in Table 38. The data met the assumptions of linearity, normality, multicollinearity, and homoscedasticity, and the influential cases were screened. The outliers may be of concern in this data set. The VIF was 1, which were lower than 10 and suggested that multicollinearity was not much of concern (Cohen et al., 2003). A scatterplot of standardized residuals against standardized predicted values was generated. Linearity seems to hold because the scatter cloud was around the horizontal line of zero; there was no curvilinear pattern. Homoscedasticity seems to hold because the scatter cloud had approximately constant variability except a couple of outliers; the Breusch-Pagan test ($p = .29$) was not significant at the 5% level, which also indicated that the error terms were

homoscedastic (Breusch & Pagan, 1979). The normal Q-Q plot was generated and suggested approximate normal distribution. The Shapiro-Wilk test with a *p*-value of .08 was not significant at the 5% level, which also suggested that the assumption of normality was satisfied. For a normal distribution, 5% distribution outside of 2 standard deviations was expected. Having 4 out of 57 subjects (about 7%) fell outside of 2 SD was higher than expected. The studentized deleted residuals and the Leverage values were also performed. For the studentized deleted residuals, 1 case had a magnitude above 3; case 37 may be of concern (Cohen et al., 2003). For the Leverage values, 4 cases had leverage values greater than .05 (3*1/57): cases 42, 56, 2, and 41 may be of concern here. The largest Cook's D was .16, which was smaller than 1. Therefore, there were no influential cases in this sample (Cohen et al., 2003).

A two-stage hierarchical multiple regression was performed between parental stress as the dependent variable and the level of informal social support as the independent variable for the U.S. sample, controlling for parents' age, family income, and parents' ethnicity. The three covariates (parents' age, family income, and parents' ethnicity) were entered at stage one, and the informal social support (FSS-informal) was entered at stage 2. When the three covariates were entered, they significantly predicted parental stress, $F(3, 53) = 3.96$, $p = .01$, $R^2 = .18$., *adjusted* $R^2 = .14$. When the informal support was added, it did not significantly improve the prediction, R^2 *change* $= .003$, $F(1, 52) = .21$, $p = .65$. The entire group of variables significantly predicted parental stress, $F(4, 52) = 2.98$, $p = .03$, $R^2 = .19$, *adjusted* $R^2 = .12$. It was concluded that there was not a significant prediction of parental stress by the informal social support, after controlling for parents' age, family income, and parents' ethnicity. Table 33 presents the unstandardized regression coefficients (B), their standard errors (SEB), the standardized

regression coefficient (β), the squared semipartial correlations (sr^2), R square, and adjusted R square. The comparison with the Chinese sample is presented in Table 38.

The data met the assumptions of linearity, normality, multicollinearity, and homoscedasticity, and the influential cases were screened. Outliers may be of concern in this data set. The VIFs ranged from 1.07 to 1.18, which were lower than 10 and suggested that multicollinearity was not much of concern (Cohen et al., 2003). A scatterplot of standardized residuals against standardized predicted values was generated. Linearity seems to hold because the scatter cloud was around the horizontal line of zero; there was no curvilinear pattern. Homoscedasticity seems to hold because the scatter cloud had approximately constant variability except a couple of outliers; the Breusch-Pagan test (p = .34) was not significant at the 5% level, which also indicated that the error terms were homoscedastic (Breusch & Pagan, 1979). The normal Q-Q plot was generated and suggested approximate normal distribution. The Shapiro-Wilk test with a p-value of .31 was not significant at the 5% level, which also suggested that the assumption of normality was satisfied. For a normal distribution, 5% distribution outside of 2 standard deviations was expected. Having 3 out of 57 subjects (about 5%) fell outside of 2 SD was expected. The studentized deleted residuals and the Leverage values were also performed. For the studentized deleted residuals, no case had a magnitude above 3 and thus no case was of concern (Cohen et al., 2003). For the Leverage values, 4 cases had leverage values greater than .21 (3*4/57): cases 56, 16, 42, and 23 may be of concern here. The largest Cook's D was .11, which was smaller than 1. Therefore, there were no influential cases in this sample (Cohen et al., 2003).

Table 33. Regression analysis summary for predicting parental stress – U.S. sample, informal support, covariates: parents' age, family income, parents' ethnicity

IVs	B	SEB	β	sr^2	R^2	ΔR^2
Step1						
Parents' Age	-.76	.44	-.22	.04	.183*	
Family Income	-2.56	1.19	-.28*	.07		
Parents' Ethnicity	-2.08	2.77	-.09	.01		
Step 2						
Parents' Age	-.75	.42	-.22	.04	.186*	.003
Family Income	-2.41	1.24	-.26	.06		
Parents' Ethnicity	-1.81	2.85	-.08	.01		
Informal Support (FSS-informal)	-.12	.27	-.06	.00		

* $p < .05$

A simple linear regression was conducted to investigate how well the formal social support predicts parental stress in the U.S. sample. The results were not statistically significant $F(1, 56) = 1.87$, $p = .18$, $r = -.18$. The comparison with the U.S. sample is presented in Table 38. The data met the assumptions of linearity, normality, multicollinearity, and homoscedasticity, and the influential cases were screened. The outliers may be of concern in this data set. The VIF was 1, which were lower than 10 and suggested that multicollinearity was not much of concern (Cohen et al., 2003). A scatterplot of standardized residuals against standardized predicted values was generated. Linearity seems to hold because the scatter cloud was around the horizontal line of zero; there was no curvilinear pattern. Homoscedasticity seems to hold because the scatter cloud had approximately constant variability except a couple of outliers; the Breusch-Pagan test ($p = .30$) was not significant at the 5% level, which also indicated that the error terms were homoscedastic (Breusch & Pagan, 1979). The normal Q-Q plot was generated and suggested approximate normal distribution. The Shapiro-Wilk test with a *p*-value of .12 was not significant at the 5% level, which also suggested that the assumption of normality was satisfied. For a

normal distribution, 5% distribution outside of 2 standard deviations was expected. Having 3 out of 57 subjects (about 5%) fell outside of 2 SD was expected. The studentized deleted residuals and the Leverage values were also performed. For the studentized deleted residuals, no case had a magnitude above 3 and thus no case was of concern (Cohen et al., 2003). For the Leverage values, 6 cases had leverage values greater than .05 (3*1/57): cases 39, 56, 35, 40, 32, and 9 may be of concern here. The largest Cook's D was .32, which was smaller than 1. Therefore, there were no influential cases in this sample (Cohen et al., 2003).

A two-stage hierarchical multiple regression was performed between parental stress as the dependent variable and the level of formal social support as the independent variable for the U.S. sample, controlling for parents' age, family income, and parents' ethnicity. The three covariates (parents' age, family income, and parents' ethnicity) were entered at stage one, and the formal social support (FSS-formal) was entered at stage 2. When the three covariates were entered, they significantly predicted parental stress, $F(3, 53) = 3.96$, $p = .01$, $R^2 = .18.$, *adjusted* $R^2 = .14$. When the formal support was added, it did not significantly improve the prediction, R^2 *change* = .001, $F(1, 52) = .08$, $p = .78$. The entire group of variables significantly predicted parental stress, $F(4, 52) = 2.94$, $p = .03$, $R^2 = .18$, *adjusted* $R^2 = .12$. It was concluded that there was not a significant prediction of parental stress by the formal social support, after controlling for parents' age, family income, and parents' ethnicity. Table 34 presents the unstandardized regression coefficients (B), their standard errors (SEB), the standardized regression coefficient (β), the squared semipartial correlations (sr^2), R square, and adjusted R square. The comparison with the Chinese sample is presented in Table 38.

The data met the assumptions of linearity, normality, multicollinearity, and homoscedasticity, and the influential cases were screened. Outliers may be of concern in this

data set. The VIFs ranged from 1.08 to 1.19, which were lower than 10 and suggested that multicollinearity was not much of concern (Cohen et al., 2003). A scatterplot of standardized residuals against standardized predicted values was generated. Linearity seems to hold because the scatter cloud was around the horizontal line of zero; there was no curvilinear pattern. Homoscedasticity seems to hold because the scatter cloud had approximately constant variability except a couple of outliers; the Breusch-Pagan test (p = .49) was not significant at the 5% level, which also indicated that the error terms were homoscedastic (Breusch & Pagan, 1979). The normal Q-Q plot was generated and suggested approximate normal distribution. The Shapiro-Wilk test with a p-value of .33 was not significant at the 5% level, which also suggested that the assumption of normality was satisfied. For a normal distribution, 5% distribution outside of 2 standard deviations was expected. Having 3 out of 57 subjects (about 5%) fell outside of 2 SD was expected. The studentized deleted residuals and the Leverage values were also performed. For the studentized deleted residuals, no case had a magnitude above 3 and thus no case was of concern (Cohen et al., 2003). For the Leverage values, 4 cases had leverage values greater than .21 (3*4/57): cases 56, 16 and 23 were of concern here. The largest Cook's D was .15, which was smaller than 1. Therefore, there were no influential cases in this sample (Cohen et al., 2003).

Table 34. Regression analysis summary for predicting parental stress – U.S. sample, formal support, covariates: parents' age, family income, parents' ethnicity

IVs	B	SEB	β	sr^2	R^2	ΔR^2
Step1						
Parents' Age	-.76	.44	-.22	.04	.183*	
Family Income	-2.56	1.19	-.28*	.07		
Parents' Ethnicity	-2.08	2.77	-.09	.01		
Step 2						
Parents' Age	-.75	.45	-.22	.06	.184*	.001
Family Income	-2.46	1.25	-.27	.06		

Table 34 (continued)

Parents' Ethnicity	-1.89	2.88	-.09	.01
Formal Support (FSS-formal)	-.18	.66	-.04	.00

* $p < .05$

A multiple linear regression was performed between parental stress as the dependent variable and the level of informal social support and formal social support as independent variables on the U.S. sample. There was no significant prediction, $F(2, 55) = 1.34$, $p = .27$, $R^2 = .05$, *adjusted* $R^2 = .01$. The regression analysis summary is presented in Table 35, including the unstandardized regression coefficients (B), their standard errors (SEB), their confidence intervals, the standardized regression coefficient (β), and the squared semipartial correlations (sr^2). The comparison with the Chinese sample is presented in Table 38.

The data met the assumptions of linearity, normality, multicollinearity, and homoscedasticity, and the influential cases were screened. Outliers may be of concern in this data set. The VIFs were 1.10, which were lower than 10 and suggested that multicollinearity was not much of concern (Cohen et al., 2003). A scatterplot of standardized residuals against standardized predicted values was generated. Linearity seems to hold because the scatter cloud was around the horizontal line of zero; there was no curvilinear pattern. Homoscedasticity seems to hold because the scatter cloud had approximately constant variability except a couple of outliers; the Breusch-Pagan test ($p = .36$) was not significant at the 5% level, which also indicated that the error terms were homoscedastic (Breusch & Pagan, 1979). The normal Q-Q plot was generated and suggested approximate normal distribution. The Shapiro-Wilk test with a *p*-value of .12 was not significant at the 5% level, which also suggested that the assumption of normality was satisfied. For a normal distribution, 5% distribution outside of 2 standard

deviations was expected. Therefore, having 3 out of 57 subjects (about 5%) fell outside of 2 SD was expected. The studentized deleted residuals and the Leverage values were also performed. For the studentized deleted residuals, no case had a magnitude above 3 and thus no case was of concern (Cohen et al,, 2003). For the Leverage values, 6 cases had leverage values greater than .11 (3*2/57): case 42, 56, 2, 41, 58, and 39 may be of concern. The largest Cook's D was .20, which was smaller than 1. Therefore, there were no influential cases in this sample (Cohen et al., 2003).

Table 35. Regression analysis summary for predicting parental stress – U.S. sample, research question 3 (informal and formal social support), no covariate

IVs	B	SEB	95% CI	β	sr^2
FSS Informal	-.25	.28	[-.80, .31]	-.12	.01
FSS Formal	-.69	.67	[-2.03, .65]	-.14	.02

A two-stage hierarchical multiple regression was performed between parental stress as the dependent variable and informal and formal social support as the independent variables for the U.S. sample, controlling for parents' age, family income, and parents' ethnicity. The three covariates (parents' age, family income, and parents' ethnicity) were entered at stage one, and the informal and formal social support (FSS) were entered at stage 2. When the three covariates were entered, they significantly predicted parental stress, $F(3, 53) = 3.96$, $p = .01$, $R^2 = .18$., *adjusted* $R^2 = .14$. When the informal and formal support were added, they did not significantly improve the prediction, R^2 *change* $= .004$, $F(2, 51) = .12$, $p = .89$. The entire group of variables did not significantly predict parental stress, $F(5, 51) = 2.35$ $p = .054$, $R^2 = .19$, *adjusted* $R^2 = .11$. It was concluded that there was not a significant prediction of parental stress by the informal and formal social support, after controlling for parents' age, family income, and parents'

ethnicity. Table 36 presents the unstandardized regression coefficients (B), their standard errors (SEB), the standardized regression coefficient (β), the squared semipartial correlations (sr^2), R square, and adjusted R square. The comparison with the Chinese sample is presented in Table 38.

The data met the assumptions of linearity, normality, multicollinearity, and homoscedasticity, and the influential cases were screened. Outliers may be of concern in this data set. The VIFs ranged from 1.10 to 1.24, which were lower than 10 and suggested that multicollinearity was not much of concern (Cohen et al., 2003). A scatterplot of standardized residuals against standardized predicted values was generated. Linearity seems to hold because the scatter cloud was around the horizontal line of zero; there was no curvilinear pattern. Homoscedasticity seems to hold because the scatter cloud had approximately constant variability except a couple of outliers; the Breusch-Pagan test (p = .51) was not significant at the 5% level, which also indicated that the error terms were homoscedastic (Breusch & Pagan, 1979). The normal Q-Q plot was generated and suggested approximate normal distribution. The Shapiro-Wilk test with a p-value of .33 was not significant at the 5% level, which also suggested that the assumption of normality was satisfied. For a normal distribution, 5% distribution outside of 2 standard deviations was expected. Therefore, having 3 out of 57 subjects (about 5%) fell outside of 2 SD was expected. The studentized deleted residuals and the Leverage values were also performed. For the studentized deleted residuals, no case had a magnitude above 3 and thus no case was of concern (Cohen et al., 2003). For the Leverage values, 3 cases had leverage values greater than .26 (3*5/57); cases 56, 16 and 42 were of concern. The largest Cook's D was .12, which was smaller than 1. Therefore, there were no influential cases in this sample (Cohen et al., 2003).

Table 36. Regression analysis summary for predicting parental stress – U.S. sample, research question 3 (informal and formal social support), covariates: parents' age, family income. parents' ethnicity

IVs	B	SEB	β	sr^2	R^2	ΔR^2
Step1						
Parents' Age	-.76	.44	-.22	.04	.183*	
Family Income	-2.56	1.19	-.28*	.07		
Parents' Ethnicity	-2.08	2.77	-.09	.01		
Step 2						
Parents' Age	-.75	.45	-.22	.04	.187	.004
Family Income	-2.36	1.29	-.26	.05		
Parents' Ethnicity	-1.70	2.94	-.08	.01		
Informal Support (FSS-informal)	-.11	.27	-.06	.00		
Formal Support (FSS-formal)	-.13	.67	-.03	.00		

* $p < .05$

4.6.3.3 Research Question 3- analysis summary and conclusion

Table 37. Pearson correlations between FSS individual items and PSI-SF total score

	FSS Items	PSI Chinese sample (n = 45)	PSI U.S. sample (n = 58)
	How *helpful* has each of the following been to you in terms of raising your child(ren)?		
Informal Social Support			
1	My parents	.01	-.23
2	My spouse or partner's parents	.06	.06
3	My relatives/kin	.01	.07
4	My spouse or partner's relatives/kin	-.08	-.05
5	My spouse or partner	-.14	-.28*
6	My friends	-.00	-.12
7	My spouse or partner's friends	-.15	-.08
8	My older child(ren)	-.04	.10
9	Neighbors	-.03	.04
10	Other parents	-.11	-.19
11	Co-workers	00	-.03
12	Parent group members	-.18	-.28*
13	Social groups/clubs	-.04	-.03
14	Church members/minister	-.18	-.28*
Formal Social Support			
15	My family or child's physician	-.07	-.16
16	Early childhood intervention program	.07	-.10
17	School/daycare center	-.08	-.15
18	Professional helpers (social workers, therapists, teachers, etc.)	.04	-.07
19	Professional agencies (public health, social services, mental health, etc.)	.07	-.07

* $p < .05$

Table 38. Research Question 3- China and U.S. comparison

IV(s)	DV	China	United States
1. informal social support	parental stress	No covariate r = -.10, r^2 = .01, F(1, 43) = .44, p = .51 Covariate: family income R^2 *change* = .004, F(1, 40) = .18, p = .67	No covariate r = -.17, r^2 = .03, F(1, 56) =1.61, p = .21 Covariate: parents' age, family income, parents' ethnicity R^2 *change* = .003, F(1, 52) = .21, p = .65
1. formal social support	parental stress	No covariate r = .03, r^2 = .0001 F(1, 43) = .30, p = .86 Covariate: family income R^2 *change* = .01, F(1, 40) = .50, p = .49	No covariate r = -.18, r^2 = .03, F(1, 56) = 1.87, p = .18 Covariate: parents' age, family income, parents' ethnicity R^2 *change* = .001, F(1, 52) = .08, p = .78
		No covariate There was not a significant difference between how informal and formal support related to parental stress: $t_{\alpha = .05,\ df = 42,\ two\text{-}tailed}$ = -.78	No covariate There was not a significant difference between how informal and formal support related to parental stress: $t_{\alpha = .05,\ df = 55,\ two\text{-}tailed}$ =.06
1. informal social support 2. formal social support	parental stress	No covariate R^2 = .02, *adjusted* R^2 =- .03, F(2, 42) = .33, p = .72 Covariate: family income R^2 *change* = .02, F(2, 39) = .51, p = .60	No covariate R^2 = .05, *adjusted* R^2 = .01, F(2, 55) = 1.34, p = .27 Covariate: parents' age, family income, parents' ethnicity R^2 *change* = .004, F(2, 51) = .12, p = .89

This hypothesis was not supported. Both formal and informal social support were not associated with lower parental stress in the U.S. and Chinese samples. There are no common statistical methods to compare the effect size (R^2) of two independent samples.

The major items within informal support scale that have significant correlation with parental stress included items 5, 12, 14 in the U.S. sample. No individual items in the formal support scale had significant correlation with parental stress in both the Chinese and the U.S. samples (see Table 37).

5.0 DISCUSSION & IMPLICATIONS FOR PRACTICE

The first important finding of this study is that parents of young children suspected or diagnosed with ASD experience high levels of parental stress in both the United States and China, which is consistent with findings from previous studies (Qing et al., 2008; Valicenti-McDermott et al., 2015). The present study found that 96% of Chinese parents and 81% of U.S. parents had stress levels at or above the 85th percentile, which was at the level that professional interventions were recommended (Abidin, 1995). As mentioned previously, high parental stress is directly and indirectly associated with many negative parent and child outcomes, such as parents' weak immune system (Fagundes et al., 2011; Robles & Carroll, 2011), parents' poor quality of sleep (Gallagher et al., 2010), parents' depressive symptoms (Caroll, 2013), insecure parent-child attachment (Reda & Hartshrone, 2008), and children's increased behavioral problems (Zeidman-Zait et al., 2014). Therefore, besides providing high quality intervention to children with ASD, early intervention programs in both countries also need to consider parental stress as an important target of intervention; they need to consistently assess parents' stress levels and provide needed services to help parents cope and alleviate their stress levels. Additionally, early intervention programs could collaborate with local adult mental health professionals to ensure that parents receive counseling or psychiatric services when needed.

Although a large percentage of parents in both samples experienced high levels of stress, the present study found that U.S. parents, on average, were less stressed than Chinese parents.

Moreover, they showed more variability in their levels of stress and social support compared to parents in China. The PI is not aware of any prior studies that explain such differences. Nevertheless, based on the demographic data of the present study and existing literature and data, parents in the United States with children in early intervention programs were culturally and/or linguistically diverse (Moore, Perez-Mendez, & Kaczmarek, 2013); all parents in the Chinese sample were Chinese who were born and lived in China. This difference between the two samples could be a factor that led to more variability among parents' stress and social support in the U.S. sample. Although the present study could not confirm the reasons behind the greater variability in the U.S. sample, the greater variability in the U.S. sample showed that U.S. programs need to accommodate for the needs of diverse parents when planning for services.

Next, as hypothesized, high levels of all four types of social support combined (perceived, received, informal, and formal support) were associated with lower parental stress among U.S. parents. However, a significant association was not found among Chinese parents. This implies that parents' cultural backgrounds could impact their responses to social support. Many programs in the United States implement best practices and evidence-based interventions, and many of these models and programs have been developed based on data collected from the majority population (Kirmayer, 2012). Consequently, they are not always culturally appropriate for other cultural groups, and even with cultural adaptation, they do not always lead to the same positive outcomes (Castro, Barrera Jr, Holleran Steiker, 2010; Kirmayer, 2012). Therefore, service delivery models in United States for children with ASD need to be adapted to accommodate for parents' cultural diversity.

When the four types of social support were analyzed individually, only the perceived support was positively associated with lower parental stress among U.S parents. This result

supports findings from previous studies in the United States: perceived support, compared to received support, has been more consistently found to have stress buffering effects (Norris & Kaniasty, 1996; Tak & McCubbin, 2002). This means that when working with parents, professionals in the United States need to make sure that they are aware of support that will be available to them when needed. For example, service providers could have a conversation with parents about potential problems, brainstorm resources and support that parents think will be available to them, and provide additional resources and support to parents as needed to strengthen their perceived support system. Unlike hypothesized, informal and formal support were not significantly associated with lower parental stress in the U.S. sample (Chiang, 2014; Hassall et al., 2005). One possible explanation is that perceived support is distributed between the informal and formal support (Figure 2). Considering the significant correlations between perceived support and informal and formal support (Section 4.5), the association between informal support and parental stress and the association between formal support and parental stress may have been diluted and thus showed insignificant associations.

Although most literature focuses on the stress-buffering effects of social support, the opposite direction of the negative associations between social support and parental stress could also be true. When experiencing high parental stress, parents could perceive less support, they could become less willing to receive social support, or they could interpret informal and formal support as less helpful. The possible impact of stress levels on parents' experience of social support need to be examined in future experimental studies.

One important finding that was not emphasized in the present study is the negative association between family income and parental stress (Table 10). Despite the availability of free services for children with ASD mandated by the Individual with Disabilities Education Act

(IDEA, 2004), parents of children with ASD are still more likely to experience economic hardship associated with child caring (Valicenti-McDermott et al., 2015). Both the present study and prior research found that economic hardship is significantly associated with higher stress levels (Jewell et al., 2015). Therefore, caregivers of children with ASD would benefit from policies and services that support their economic well-being.

Another important finding that was not a main focus of the present study is the benefits of providing social support to others. Item 14, "my friends and family feel comfortable asking me for help", of the perceived support measure (SSS) showed a significant association with parental stress in the U.S. sample. This suggests that providing social support could have beneficial effect on parents' stress level. Altruistic behaviors have been found to be associated with better mental health (Brown, Consedine, & Magai, 2005; Schwartz, Meisenhelder, Ma, & Reed, 2003). Taylor (2012) also stated that providing social support could be potentially beneficial for various reasons. For example, providing support could strengthen the relationship with another person, and positive relationship could have beneficial effect on one's well-being. Another possible reason is that some people believe that they are more likely to have the needed support in the future (improved perceived support) if they first provide support to others. Providers in the United States should keep this possibility in mind and encourage some of their parents to provide support and assistance to others. This suggestion needs to be given with caution to avoid two possible negative outcomes: a sense of guilt for not being able or willing to help and a feeling of additional burden for giving more support than their capacity (Schwartz et al., 2003).

For parents in the Chinese sample, none of the four types of social support (combined or individually) had a significant association with parental stress. Although the internal consistencies of all social support measures were satisfactory in the Chinese sample (Bland &

Altman, 1997), to the PI's knowledge, they had never been used with other Chinese samples. As previously mentioned, the majority of people in the United States are more individualistic, and the majority of Chinese people are more collectivistic (Kim et al., 2008). This variation could lead to differences in how people perceive and use social support (Chang, 2014; Taylor et al., 2007). For example, when receiving professional services, most individualistic parents would feel positive about having their needs met; nevertheless, collectivistic parents may feel guilty about creating burdens for the society while feeling positive about having the needed help to better support their children's development. Therefore, a possible explanation for the nonsignificant association between social support and parental stress found in this study is that the social support measures did not accurately capture parents' experience of social support in China. For example, when filling out the received support measure, some parents told the PI that most adults in China would not ask for or borrow a small amount of money ($25) from friends and families. They would only ask for money when they needed a much larger amount of money. Another example is the measure of informal and formal support. Some Chinese parents were confused about the difference between the last two options on the rating scale, Very Helpful versus Extremely Helpful. They said that they could not distinguish the difference between these two selections.

5.1 LIMITATIONS

The present study extended previous research but still has limitations. First, the data were collected using solely self-report measures. Although the PI tried to minimize the impact of social desirability by making all questionnaires anonymous, social desirability and incorrect

interpretation of items potentially could affect the accuracy of data. Second, as mentioned in the previous section, the social support measures used in the present study were developed in the United States, therefore, they may not capture the availability and use of social support in China.

Furthermore, the generalizability of findings from the Chinese sample is limited in two ways. First, the data were collected in 2013. China is currently developing and changing at a fast pace. Parents' knowledge of ASD, people's understanding and acceptance of children with ASD, and resources for families with children with ASD have changed during the past three years. Therefore, findings from the present study may be slightly different from the current experience of parents in Shanghai and Chongzhou. For example, the society's understanding of ASD and the availability and quality of ASD services may have improved since 2013. Second, findings from parents recruited in China may have limited generalizability to Chinese parents in the United States due to differences in the overall living environment between the two countries, available medical, professional, and social resources, and parents' level of acculturation to the U.S. culture. For example, due to limited social services, parents in China are more likely to rely on family and friends when needing support. However, after Chinese parents immigrate to the United States, they may gradually become more open to receiving social and professional services.

Another limitation of the present study is the gender of parents. Both the Chinese and U.S. samples had few fathers complete the questionnaire. Prior studies found that mothers and fathers of children with ASD could vary in their parental stress and experience with child-rearing (McStay et al., 2014; Rivard et al., 2014). While conducting this study, the researcher had the chance to talk with some mothers and found that many of their husbands were highly involved in

child-rearing. Therefore, researchers need to make additional efforts to reach out to fathers, so early intervention professionals can understand how to better support fathers.

5.2 FUTURE DIRECTIONS

Due to high levels of stress experienced by parents of young children with ASD, researchers, policy makers, and professionals in China are needed to work together to understand better the needs of parents and thus provide them with improved support. In addition, qualitative studies (individual interviews and focus groups) are needed to determine the needs of parents in cities and rural areas. Researchers also need to examine whether parents' stress levels and experience with social support vary according to their demographic characteristics. In terms of measurement, tools that can produce reliable, valid, and culturally appropriate social support measures would alert practitioners to what resources and needs families have at their children's intake and at ongoing assessments. Finally, when the PI was in China in 2013, all the data collection sites focused mainly on children's treatment. Due to the high parental stress levels found in this study, intervention programs for children with ASD should expand and improve their services to support parents, including fathers, in addition to providing high quality services and education to children.

In the United States, a new social support measure is needed to determine caregivers' experiences with different types of social support. Considering parents' high stress levels and the amount of existing paper work, this measure should be as short and as easy to answer as possible. This measure could consist of items on a Likert scale or open-ended questions to allow time for conversation and flexibility. This measure could also be helpful to family-focused

programs for children with ASD: it could facilitate and improve treatment planning and it could remind service providers to think about social support from a broader perspective.

The present study found that U.S. parents, compared to Chinese parents, had greater variability in their stress levels. Future studies are needed to determine the factors which contribute to both low and high parental stress. Researchers may also want to examine the impact of various demographic characteristics on parents' experience with raising a child with ASD. For example, does living in rural versus urban area affect U.S. parents' stress level and experience with social support?

Another future direction is that the field of early intervention and early education in the United States needs to advance clinical and empirical work for families of racial and ethnic minorities. Although the present study focuses on the differences between parents in the United States and China, it implies that cultural background could have important impact on parents' use of and responses to social support. Therefore, more studies with parents of ethnic minorities in the U.S. need to be conducted, so the field of early intervention can have a better understanding of the needs of diverse parents and thus find improved ways to support them. When studying parental stress and social support among parents from different cultural backgrounds in the United States, there are at least two essential factors that need to be taken into consideration: within group differences (i.e. social classes and gender) and levels of acculturation. Acculturation is a complex process which could impact parenting practice and child development (Cheah, 2016). For example, in Cabrera and the SRCD Ethnic and Racial Issues Committee's study on minority children (2013), all Chinese immigrant mothers expressed the need to stay flexible with their parenting values, behaviors, and attitudes to support their child's development in the United States.

5.3 CONCLUSION

The number of children with ASD has tripled since 2000 (CDC, 2016). Parents of children with ASD are more likely to experience high levels of parental stress (Qing et al., 2008; Valicenti-McDermott et al., 2015), and high parental stress is associated with numerous negative parent and child outcomes (Robles & Carroll, 2011; Zaidman-Zait et al., 2014). Social support has been identified as having stress-buffering effects, but the field has limited understanding of the impact of different types of social support on parents of young children with ASD. In addition, as the immigrant population increases in the United States, limited research exists to provide guidance on ways to modify early intervention service delivery models to accommodate for cultural diversity. The present study concluded that U.S. and Chinese parents showed different patterns of association between parental stress and the four types of social support (perceived, received, informal, and formal support). This study pointed out the importance of thinking about parents' social support from a broad perspective when serving parents. It also indicated the need to understand better ways to provide high-quality and culturally appropriate support to parents from diverse cultural backgrounds.

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