CHILDREN WITH AUTISM IN TAIWAN AND THE UNITED STATES: PARENTAL STRESS, PARENT-CHILD RELATIONSHIPS, AND THE RELIABILITY OF A CHILD DEVELOPMENT INVENTORY

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Autism is one of the fastest growing childhood disorders in the world, and the families that have children with autism experience frustration and stress due to many practical problems. With the increase in the prevalence of autism, it is urgent to raise awareness of autism and to provide services and support for children with autism and their parents to improve the parent-child relationship and moderate the parental stress.

With regard to families with children diagnosed as autistic, the purposes of this study are to: (a) examine the group differences in parental stress and parent-child relationship between Taiwan and the United States based on racial and cultural differences; (b) identify factors, if any, that influence the parental stress and parent-children relationship; (c) investigate if there are differences in the results of child development when children are diagnosed with autism in these two countries; (d) establish the Battelle Development Inventory-II in Mandarin Chinese version for use of evaluation with development delays in Taiwan.

Findings revealed that: (a) the Battelle Developmental Inventory, Second Edition (BDI-II), is highly reliable with a great value of internal consistency in the use with parents and children with autism in Taiwan; (b) there is no significant difference in child development and parent-child relationship based on geographic region (Taiwan and the United States); (c) parents of children with autism in the United States overall have a more positive parent-child relationship.
and parenting attitude than parents of children with autism in Taiwan; (d) Children with autism who have a positive relationship with their parents have a higher pass rate on the evaluation of child development; (e) fathers reported higher pass rate on BDI-II than mothers in one of the standard deviations of over BDI-II performance; (f) parent-child relationships are positively correlated with parental stress; (g) parents who received services and support from a government agency or school in Taiwan have significantly lower scores on the parent-child relationship inventory; (h) fathers of children with autism have higher stress level than mothers; (i) parents who received services and support from parent groups (such as PTA or parent association) and from a government agency or school feel less stress than parents that did not receive those supports in Taiwan.
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CHILDREN WITH AUTISM IN TAIWAN AND UNITED STATES

Introduction

Autism is a neural developmental disorder characterized by impaired social skills, communication disorders, and repetitive behavior (Boutot & Myles, 2011). It is the fastest growing childhood disorder, and is more common than childhood cancer and multiple sclerosis combined (Newschaffer et al., 2007; Twoy, Connolly & Novak, 2007). Autism has been found all around the world in families of all races, ethnicities, and socio-cultural backgrounds. No single factor has been shown to cause autism (Levy, Mandell, & Schultz, 2009). According to the Centers for Disease Control and Prevention (2010), 1 in 110 children in the United States is diagnosed with an autism spectrum disorder (ASD) and boys are more frequently diagnosed with autism than girls. In 2010, the Texas Council on Autism and Pervasive Developmental Disorders (2010) developed a five-year state plan aimed at creating an evidence-based “lifespan of services” for all Texans with ASD. In addition, there are a growing number of children in Taiwan who have been diagnosed with autism. Statistics taken from the Special Education Transmit Net in Taiwan showed that in 2001, the total population of children with autism from ages 6-12 was 917; by 2010, that number had increased to more than 4,000 (Chang & Chang, 2010).

Having a child that is diagnosed with autism is often a challenge for a family; it can cause
frustration and stress due to many practical issues, such as treatment method, financial issues related to treatment, and educational issues (Hutton & Caron, 2005).

Current practice includes the use of different interventions, and use of various diagnostic instruments in each state in the United States. Stahmer and Mandell (2007) reported inconsistencies between different districts and regions regarding their respective policies and practices for the screening and caring of children with autism. In addition, the challenges are increased for the families of children with autism when there is a lack of understanding and available information about the disorder in the community (Altiere & Von Kluge, 2009). Autism in Taiwan also is increasingly prevalent, but still not widely recognized (Chien, Huang, & Lung, 2009). Researchers investigating autism in Taiwan rely heavily on information and data gathered in the United States, as well as the translated instruments developed in the United States. However, not all the translated instruments have established validity and reliability (Tsai, McClelland, Pratt, & Squires, 2006). It is important to determine if a diagnosis of autism might be influenced by racial and cultural differences. Moreover, information concerning the causes and treatments of autism is urgently needed to increase the understanding of the disorder in Taiwan.

**Impact on Family and Parent-Child Relationship**

Both parents and siblings face challenges and stress when there is a child with autism in
the family. Often, siblings of children with autism demonstrate more issues with behavior than those who do not have siblings with autism, and may feel neglected and remain lonely (Benderix & Sivberg, 2007; Macks & Reeve, 2007). Siblings bear more of the impact of having a sister or brother with autism in the family because siblings are the first childhood partner (Ghanizadeh, Alishahi, & Ashkani, 2009). Since the relationship of siblings last longer due to its roots into earlier days of childhood, its effects are also unique and long lasting, such as social adjustment problems (Orsmond, Kuo, & Seltzer, 2009). Siblings are consistently faced with issues, such as intelligence detriments, sympathetic feelings, and frightening behavior that they are either witness to or a part of, which can negatively affect their relationships with others (Benderix, & Sivberg, 2007). Also, siblings are embarrassed and may feel guilt (Ross & Cuskelly, 2006).

The social, emotional, mental, and financial impacts of having a child with autism in the family, in addition to the influence on siblings that parents also need to consider and manage, cause parents or primary caregivers of children with autism to experience challenges that may affect parent-child relationships (Altiere & Von kluge, 2009; Ghanizadeh, Alishahi, & Ashkani, 2009; Konstantarcas, 1991). Rivers and Stoneman (2008) stated that the disappointment of parental care from sibling might risk the relationship between parents and children. Therefore, parents of children with autism face the challenge of providing the appropriate support for their
child with autism, while also decreasing the potential negative impact on siblings.

The presence of a child with autism means an increased burden of responsibilities. There are the numerous therapeutic sessions from the beginning of the diagnoses through the inception of interventions, selection of a school and education method, and the addressing of the behavioral and social adjustment problem. These issues may prevent normal family functions due to more school absences and less participation in social activities. Parents experience more difficulty with childcare, parenting skills, and employment (Blanchard, Gyrka, & Blackman, 2006).

A child with the symptoms of autism may cause his/her parents to experience from varying levels of distress (Macks & Reeve, 2007). Children with autism influence not only the social and mental adjustment of a family, but also the economic balance (Estes et al., 2009). Lower income families of children with autism will usually feel a heavier financial burden (Schieve, Blumberg, Rice, & Visser, 2007). The families tend to have frequent financial crises, and are always in need of extra income for the child’s medical and treatment costs (Weiss & Lunsky, 2010). Most families of children with autism will spend approximately 1000 hours per year communicating with agencies and receiving care and support for the necessary psycho-educational early intervention programs (Jarbrink, 2007).

Ghanizadeh, Alishahi and Ashkani (2009) indicated that in order to fulfill the time
consuming needs of the child, parents often sacrifice their own social contacts with family, friends, and community. Tsai and Wang (2009) indicated that the developmental and intervention process of a child with autism affects the health of the parents. Halterman (2007) concluded that parents are mentally affected by having a child with autism and have poorer mental health than the general population. Mothers and fathers feel effects from physical functions, such as exhaustion and tiredness (Allik, Larsson & Smedje, 2006). Similarly, Lach et al. (2009) found higher rates of physical health problems in caregivers of children with autism than caregivers of non-autistic children. Parents often experienced feelings of extreme anger, guilt, depression, and anxiety; these feelings ultimately expressed themselves through psychosomatic problems (Bilgin & Kucuk, 2010).

The effects of having a child with autism in the family are significantly worse for parents because they stay close to the child and therefore become the most vulnerable as the heavy burden bearers of the family (Bilgin & Kucuk, 2010). Preserving the parents’ health and well-being is a precondition for caring for children with autism (Benjak et al., 2009). The normal warmth of the parent-child relationship is connected with care giving achievements (Orsmond et al., 2009). Bilgin and Kucuk (2010) suggested that a close relationship in the family would develop a positive attitude for children with autism and the family members.
Autism in Taiwan

Chiang (2008) states that autism research in Taiwan has generally followed precedents established by western countries. Although the significance of autism and the importance of early intervention have gradually come to be appreciated in Taiwan, autism the lack of funds has stifled the research, and qualified professionals are urgently needed (Ho, 2009).

The majority of assessment tools used in diagnosing autism in Taiwan were developed in the United States (Chang & Wang, 2005). Ho (2008) has argued that the reliability and validity of assessment instruments in Taiwan should be scrutinized in light of cultural differences.

Lin (2006) reported that the existing Taiwanese studies of autism mainly focus on the causes, classifications, diagnosis or interventions. The needs of the families of children with autism should also be considered. Evidence has shown that parental stress has an important impact on interventions (Baker-Ericzen, Brookman-Frazee, & Stahmer, 2005). Mahoney and MacDonald (2009) noted that when there is a strong relationship between parents and their children who are diagnosed with autism, the children will learn skills and concepts better with parents than through interactions with professionals. Ho (2008) indicated, in addition, that parents of children with autism in Taiwan tend to have “weak parental willingness to receive services” (p.13). Parents sometimes have difficulty facing the fact that their child is diagnosed as autism and are not willing to seek help.
Methods

Participants

Parents were recruited for this study if they had a child who had been diagnosed with autism in Taiwan or the United States. The child had to be between ages of 2 to 7, and diagnosed with autism by a child psychiatrist in Taiwan or by school district personal in the United States. Participants included 75 primary caregivers of children with autism in Taiwan and nine mothers in the United States. A total of 100 copies of the surveys was sent in Taiwan and a total of 35 copies was sent in Texas, U.S. The return rate was 75 % in Taiwan and 26 % in the United States.

Procedure

In Taiwan, parents of children with autism who were referred to a pediatric psychopathologist and classified on the basis of Diagnostic and Statistical Manual of Mental Disorders (4th Edition) criteria were contacted through the Autism Society Taiwan in eight different cities and counties in Taiwan, including Keelung City, Taipei City, Taipei County, Taichung City, Changhua County, Kaohsiung City, and Taitung City. Data collection from the U.S. was collected in Denton Independent School District, Lake Dallas Independent School District, and Lewisville Independent School District due to a convenience sample. Two main reasons for targeting these schools districts were that (a) they were fairly close in proximity to the
researcher’s university, and (b) the school districts helped children from age 2-7 with autism and their families. Presidents of each autism association in Taiwan and director of special education in the above school districts in the U.S. were contacted by email and/or telephone prior to the study to request their consent and participation. After receiving approval from school districts and autism associations, the instruments were delivered to each school and each office.

Primary caregivers of children with autism received the packet through the principals, diagnosticians, or teacher in schools in the U.S. and the social workers of autism associations in Taiwan and returned to the completed surveys to each school in the U.S. or to the autism association in Taiwan.

Measures

Demographic Questionnaire and Stress Level

Participants were asked a variety of questions about demographic information. The questions asked parents to provide information about themselves and the child. The questions included the gender and age of the child, the gender and age of the primary caregiver’s, the caregiver’s relationship with the child, marriage status, and other related characteristics. Educational level and occupation of the primary caregivers were asked to determine the socioeconomic status (SES) of primary caregivers. The occupational scale was given a weight of 7 and the educational scale was given a weight of 4 based on Hollingshead’s index of social
position, a 2-factor scale used for sociological analysis. The classification system divided the social position into 5 categories, including lower, lower-middle, middle, upper-middle, and upper (Hollingshead, A. B, 1957; Miller, & Salkind, 1991). Participants also completed a brief questionnaire regarding their stress. All indicators were variables of possible stress from literature reviews and were measured by a 5-point Likert scale (1 = negative impact to 5 = positive impact) for parents to rate how parenting a child with autism affects the aspects of their life.

Parent-Child Relationship Inventory (PCRI)

The Parent-Child Relationship Inventory (PCRI) was a self-report measure intended to evaluate the characteristics of parents’ relationship with their children. Moreover, it is developed to identify potential factors of “normal and problematic parenting from preschoolers through adolescents” (Coffman et al., 2006, p.210). The PCRI contains 78 items and consists of 7 content scales, which include Parental Support Scale, Satisfaction with Parenting, Involvement, Communication, Limit Setting, Autonomy and Role Orientation. Parents respond to the statements using 4-point Likert scales. The anchors of the scales are: 1 = strongly agree, 2 = agree, 3 = disagree, and 4 = strongly disagree. Lower scores indicate greater parenting difficulties (Gerard, 1994). According to the manual of PCRI, the mean value of internal consistency was .80 and the test-retest reliability ranged from .68-93. Aring and Renk (2010)
also reported Cronbach’s alphas of PCRI from .76-.88 and the reliability coefficients ranged from .68-.93 in their study conducted with parents of children from age 2-6. Another study with 100 parents of children from age 5-12 reported that PCRI demonstrated good internal consistency with a mean of Cronbach’s alphas of .78 (Schroeder & Kelley, 2009).

*Battelle Development Inventory-II (BDI-II)*

The Battelle Development Inventory was a discriminative measure of developmental abilities for children from birth through nearly 8 years (7 years and 11 months). According to the BDI-II examiner’s manual (Newborg, 2005), the instrument was well-established screening tool used for identifying strengths in developmental skills. It also highlighted the opportunities for learning for typically developing children as well as those with disabilities or developmental delays. The Battelle Development Inventory, 2\textsuperscript{nd} edition, screening test includes 100 questions, which produced a total score and the five subscales of motor, adaptive, communication, cognitive and personal-social domains (Newborg, 2005). Each question represented a behavior or task, and parents gave points from 0 to 2 for each question based on the performance of the child on the task. Once the raw scores were calculated, the results determined if the child passed and needed referral on the individual domains based on cutoff level of their ages in standard deviations (SD). The range of reliability coefficients on original scales was .78 -.96. Content validity, construct validity, and concurrent validity were obtained using the
original Battelle Developmental Inventory (Newborg, Stock, Wnek, Guidubaldi, Svinicki, Dickson, et al., 1998). Elbaum, Gattamorta, and Penfield (2010) conducted a study to evaluate the BDI-II on children who were eligible for early intervention or preschool special education services in Florida and found the BDI had excellent reliability data (.93-.95). In addition, Pepe (2003) stressed the importance of the sensitivity and specificity of the adequacy of a screening test. Sensitivity values for BDI-II ranged from .72-.93 and the specificity ranged from .79-.88 (Nowborg, 2005).

Translation of the Instruments

Before the BDI-II and PCRI could be provided to primary caregivers of children with autism, researchers translated the instruments into Mandarin and modified some questions to fit the Taiwanese social contexts. Its wording and meaning were modified based on the recommendations of one professor in the field of special education who was fluent in both English and Mandarin. The forward-and-backward translation was done to maintain the conceptual validity. All disagreements were resolved. In addition, the survey was given to a mother of a 3-year-old child with autism who was also fluent in both English and Mandarin to test the validity and recheck the equivalent to the original English version. The research also translated the consent form and cover letter into Mandarin. The consent form was designed to provide respondents with information about their rights and protect them from unexpected
harm. It was also necessary to comply with the University of North Texas Institutional Review Board (IRB) standards.

*Human Subjects Protection*

Prior to the study, all the instruments in English and Mandarin, the consent form, and the other materials pertaining to the study were submitted to the University of North Texas Institutional Review Board (IRB) for human subject protection and to assure compliance with the University’s ethical standards. Participants were not excluded based on gender, ethnicity, or socioeconomic status. Participants were informed that their involvement was voluntary. The parents were asked to sign a consent form, which was collected prior to completion of the questionnaire. The confidentiality of participants was protected by assigning an identification number for their computer entry.

*Data Analysis*

The purpose of this study was to determine whether there was a statistically significant difference in parent-reported children development inventory, parent-child relationship, and parental stress between groups in Taiwan and the United States. Moreover, the study examined if any factors were related to the parent-reported children development inventory, the parent-child relationship, and reported parental stress. SPSS version 16 was used for analyses.
Cronbach’s alpha was used to assess the internal consistency for the Mandarin versions of the PCRI and BDI-II. Descriptive analyses was conducted for demographic variables. Specifically, frequencies and percentages were used to describe categorical demographic variables (e.g., child’s gender, parent’s gender, parent’s age, marital status, SES). In addition, participants’ ratings of stress on various aspects of their lives were analyzed with descriptive statistics (i.e., means and standard deviations). The Parent-Child Relationship Inventory (PCRI) subscale scores (e.g., parental support, satisfaction with parenting, involvement), the PCRI overall scores, and Battelle Developmental Inventory II (BDI-II) domain scores were analyzed with means and standard deviations. Preliminary analyses are conducted to examine the potentially significant relationships between the demographic variables and support variables. For example, cross-tabulations using Pearson chi square analyses were conducted to examine the relationships between categorical demographic variables (e.g., child’s gender, parent’s gender, SES) and categorical stress items.

Primary analyses were used to examine the seven research questions. The first research question asked if there are any differences between geographic regions (Taiwan and United States) on both domain and total scores, and the pass rate of the BDI-II. Due to the low cell sizes, Fisher’s exact test and Mann-Whitney test were used for each of the five BDI domains and for the pass rate within three standard deviations (-1, -1.5, -2), with geographic regions as the
independent variable. The second research question asked if there were any differences between Taiwanese groups and American groups on the PCRI subscale scores and overall PCRI total scores. A Mann-Whitney analysis was conducted to examine the effect of group on the PCRI subscale scores and total scores. The third research question addressed a relationship between the parent-child relationship and the pass rate of parents’ ratings on the BDI-II. Logistic regressions were used to answer this research questions. This analysis determined whether parent relationship affects the likelihood of passing. The fourth research question asked what the differences were in the BDI-II based on the demographic variables, such as parent’s gender, parent’s age, child’s gender, marital status, SES, and the number of children, such as the services or supports parents have experiences. Chi-square was used to examine the pass rate of BDI-II based on demographic variables and support variables. Logistic regressions were conducted for examining the relationship between stress score and pass rate on BDI-II. Furthermore, the fifth research question if demographic variables and support variables have a significant effect on the scores of PCRI. Correlation was used to investigate the relationship between stress score and PCRI. ANOVA and t-tests were conducted to examine the effect of demographic variables and support variables on the score of PCRI. The sixth research question asked if there was a difference between stress levels for Taiwanese parents and American parents. To analyze the sixth research question, Mann-Whitney U test was conducted on total
stress scores with the groups (i.e., Taiwan, United States) as the independent variable. Finally, Mann-Whitney test was conducted for the seventh research question, which asked what demographic variables and support variables, if any, are predictive of parents’ total stress scores. All statistical tests were conducted at the $p = .05$ level.

**Limitations of the Study**

The findings and conclusions reached in this study were limited by two factors. First, the conclusions of this research data can only be generalized and applied to the children with autism in Taiwan and the United States based on a convenience sample. Secondly, the outcomes can be generalized only to parents’ use of Battelle Developmental Inventory to evaluate the developmental skills of children with autism in home environments.

**Results**

**Data Screening**

*Data Coded and Variables Collapsed*

According to the manual of PCRI, if the participants had less than eight missing responses, modal responses of each item were used (Gerard, 1994). While examining the normality of each variable, several variables were collapsed into different levels to meet the normal distribution. The number of children was collapsed from a continuous variable into categorical variables (1 child, 2 children, or 3 and more children). A collapsed version of parent’s
marriage status became marriage status verses other status. SES was coded as two levels: lower and lower-middle versus middle and upper-middle. The age of parents was also collapsed as two levels: age of 25-36 and age of 36 and plus.

Deleting Cases

One case was deleted during the check for duplicate cases. All variables were examined for missing values. Missing data patterns indicated that data were missing at random; missing data values were coded in SPSS. No case was removed due to missing data. Two cases were deleted due to the concern of outliers in the variables of stress level and PCRI.

Matching Sample

In order to answer the research questions, which addressed the comparison of BDI-II score, PCRI score, and stress score based on participants’ national residency, a matching sample was created. The child’s gender, age, and parents’ SES of the participants in the United States \( (n = 9) \) were used as the criteria to find matched participants in Taiwan \( (n = 9) \). The matching sample had a total of 18 participants and the sample was used to answer Research Questions 1, 2, and 6.

Reliability of BDI and PCRI

One of the purposes of this study was to establish reliability of the Mandarin Chinese version of BDI-II, in order to introduce a reliable instrument for evaluating child development.
Cronbach’s alpha was used to determine reliability for both the BDI and PCRI subscales. The BDI consisted of 5 domains (α = .906). In addition, the Cronbach’s alpha was conducted to check the reliability of PCRI in this study. The PCRI consisted of 78 items (α = .850).

**Descriptive Analyses**

The study recruited primary caregivers of children with autism. Both groups of children in Taiwan and the United States were ages 2-7 (median age = 5 years, 3 months). All children in the United States are boys (n = 9). In the group of Taiwanese children, girls (n = 9) and boys (n = 63) had a ratio of 1:7. Most primary caregivers fall into the age range of 36-40 (34%), and 28.4% are between age 31-35. Mothers are the primary caregivers (n = 69) of children with autism compared to fathers (n = 12). In the Taiwanese group, parents’ social economic statuses are: 16.7% in the lower position, 38.9% in lower-middle position, 29.2 % in middle position, and 13.9% in middle-upper level. In the matched sample (Taiwan verse the United State), 66.7% of parents are considered in the lower-middle level. In this study, the average of number of children in the family was 2, and 6 parents reported having more than 1 children with autism in their families.

Part of the demographic questionnaire asked if parents received any kind of support or services. Table 1 indicates that 83.3% of parents in Taiwan have received support or services from government agencies or schools, and 95.8 % of parents have received services from
hospital. About eight-nine percent of parents in the United States reported experience of support from relatives, while only 19.4% of parents in Taiwan seek help from relatives.

Table 1

Frequencies and Percentages of Support/Service Received in Two Countries

<table>
<thead>
<tr>
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<th>Taiwan Group</th>
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<th>U.S. Group</th>
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<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Parent group</td>
<td>31</td>
<td>56.9</td>
<td>6</td>
<td>66.7</td>
</tr>
<tr>
<td>Educational group</td>
<td>38</td>
<td>52.8</td>
<td>3</td>
<td>33.3</td>
</tr>
<tr>
<td>Religious group</td>
<td>6</td>
<td>8.3</td>
<td>5</td>
<td>55.6</td>
</tr>
<tr>
<td>Relatives</td>
<td>14</td>
<td>19.4</td>
<td>8</td>
<td>88.9</td>
</tr>
<tr>
<td>Government agency or school</td>
<td>60</td>
<td>83.9</td>
<td>1</td>
<td>11.1</td>
</tr>
<tr>
<td>Hospital</td>
<td>69</td>
<td>95.8</td>
<td>9</td>
<td>100</td>
</tr>
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</table>

For the BDI-II, children in Taiwan have a pass rate of 18.1% on total score when it is -1.0 standard deviation below the mean. As the standard deviation gets to -2, the pass rate on the total score increases to 37.5%. Table C4 in Appendix C reported the pass rate of total score and each domain in three different standard deviations (-1, -1.5, and -2). The mean of stress score is 43.83, and the mean of PCRI total score is 206.93 for parents in Taiwan. (Table C5 and C6 indicated the means and standard deviations of stress level and PCRI).

Preliminary Analyses

The chi-square test was conducted to estimate the differences and relationships among demographic variables and support variables. Results indicated that mothers (88%) had a
significantly higher rate of receiving support or services from government agencies or schools than fathers (58%) in Taiwan, $X^2=6.46$, $p=.023$. There were no significant relationships among other demographic variables and support variables.

**Primary Analyses**

**Results for Research Question 1**

The first research question asked if there were any significant differences in subscale scores and total score of BDI-II, and the pass rate of the BDI-II between geographic regions (Taiwan and United States). The results of Fisher’s exact test for differences in pass rate on total score and subscale scores of each standard deviation (-1, -1.5, -2) between countries indicates there were no significant differences in pass rates in each standard deviation between countries.

There were also no significant differences in pass rates for any BDI-II sub-domain between children with autism in Taiwan and the United States (as shown in Table C8, Appendix C).

A Mann-Whitney analysis revealed that there was no significant difference found in any domain scores (as shown in Table C9).

**Results of Research Question 2**

The second research question asked if there was a significant difference in the scores of
parent-child relationship as measured by PCRI of children have been diagnosed with autism in
Taiwan and U.S. Mann-Whitney U tests found that there were significant differences in
parent-child relationship between groups in Taiwan and United States on several subscales of
the PCRI (Table 2). For total score of PCRI, parents in the United States ($M = 234.56, SD = 10.85$)
had significantly higher scores than parent in Taiwan ($M = 211, SD = 14.42$), $U(16) = 6.50$. For
satisfaction, parents in the United States ($M = 36.44, SD = 2.07$) had significantly higher scores
than parents in Taiwan ($M = 28.78, SD = 3.56$), $U(16) = .1$. For involvement, parents in the United
States ($M = 48.44, SD = 2.70$) had significantly higher scores than parents in Taiwan ($M = 40.56,
$SD = 4.75$), $U(16) = 4.50$. For autonomy, parents in the United States ($M = 27.44, SD = 2.07$) had
significantly higher scores than parents in Taiwan ($M = 24.56, SD = 2.40$), $U(16) = 14$.

Table 2

Analyses of Differences in PCRI Score by Countries

<table>
<thead>
<tr>
<th>Scale</th>
<th>Country</th>
<th>Mean Rank</th>
<th>Mann-Whitney</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Score of PCRI</td>
<td>Taiwan</td>
<td>5.72</td>
<td>6.50**</td>
</tr>
<tr>
<td></td>
<td>United States</td>
<td>13.28</td>
<td></td>
</tr>
<tr>
<td>Support</td>
<td>Taiwan</td>
<td>8.44</td>
<td>31.00</td>
</tr>
<tr>
<td></td>
<td>United States</td>
<td>10.56</td>
<td></td>
</tr>
<tr>
<td>Satisfaction</td>
<td>Taiwan</td>
<td>5.11</td>
<td>1.00***</td>
</tr>
<tr>
<td></td>
<td>United States</td>
<td>13.89</td>
<td></td>
</tr>
<tr>
<td>Involvement</td>
<td>Taiwan</td>
<td>5.5</td>
<td>4.50**</td>
</tr>
<tr>
<td></td>
<td>United States</td>
<td>13.5</td>
<td></td>
</tr>
</tbody>
</table>

*(table continues)*
Table 2 (continued).

<table>
<thead>
<tr>
<th>Scale</th>
<th>Country</th>
<th>Mean Rank</th>
<th>Mann-Whitney</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication</td>
<td>Taiwan</td>
<td>9.06</td>
<td></td>
</tr>
<tr>
<td></td>
<td>United States</td>
<td>9.94</td>
<td>36.50</td>
</tr>
<tr>
<td>Limit Setting</td>
<td>Taiwan</td>
<td>9.39</td>
<td></td>
</tr>
<tr>
<td></td>
<td>United States</td>
<td>9.61</td>
<td>39.50</td>
</tr>
<tr>
<td>Autonomy</td>
<td>Taiwan</td>
<td>6.56</td>
<td></td>
</tr>
<tr>
<td></td>
<td>United States</td>
<td>12.44</td>
<td>14.00*</td>
</tr>
<tr>
<td>Role Orientation</td>
<td>Taiwan</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>United States</td>
<td>9</td>
<td>36.00</td>
</tr>
</tbody>
</table>

*\( p < 0.05, ** p < 0.01, *** p < .001 \)

**Results of Research Question 3**

The third research question asked if there was a relationship between parent-child relationships as measured by the PCRI and the parents’ ratings on the BDI-II in Taiwan. For Taiwanese families, the results indicated that PCRI is a significant predictor of passing BDI-II in total score within all three standard deviations (-1, -1.5 and -2). For BDI total with SD-1, the overall logistic regression was significant, \( \chi^2(1) = 5.17, p = .023 \). The estimated \( R^2 \) was Cox & Snell = .070 and Nagelkerke = .114, indicating that PCRI accounted for between 7.0% and 11.4% of the variance in Total-1, which is a significant amount. The odds ratio for PCRI of 1.057 means that for each one-point increase in PCRI, the Total-1 will increase by 5.7%, a significant amount \( (p = .036) \). For total score of BDI-II with standard deviation -1.5, the overall logistic regression was significant, \( \chi^2(1) = 5.46, p = .019 \). The estimated \( R^2 \) was Cox & Snell = .074 and Nagelkerke
=.108, indicating that PCRI accounted for between 7.4% and 10.8% of the variance in total score of BDI-II (SD = -1.5), which is a significant amount. The odds ratio for PCRI of 1.050 means that for each one-point increase in PCRI, the total score of BDI-II (SD = -1.5) will increase by 5.0%, a significant amount (p = .030). For BDI total with SD -2, the overall logistic regression was significant, $X^2(1) = 8.60, p = .003$. The estimated $R^2$ was Cox & Snell = .114 and Nagelkerke = .155, indicating that PCRI accounted for between 11.4% and 15.5% of the variance in Total-2, which is a significant amount. The odds ratio for PCRI of 1.059 means that for each one-point increase in PCRI, the Total-2 will increase by 5.9%, a significant amount (p = .008). Overall, PCRI is a significant predictor of passing the BDI for Taiwanese families, with each point on the PCRI increasing probability of passing BDI by about 5-6%.

Table 3

Summary of Logistic Regression Predicting Pass Rate of BDI-II from PCRI Total Score

<table>
<thead>
<tr>
<th></th>
<th>$X^2$</th>
<th>df</th>
<th>p</th>
<th>Cox &amp; Snell $R^2$</th>
<th>Nagelkerke $R^2$</th>
<th>$e^b$</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>BDI.SD-1.Total</td>
<td>5.167</td>
<td>1</td>
<td>.023</td>
<td>.070</td>
<td>.114</td>
<td>1.057</td>
<td>.036</td>
</tr>
<tr>
<td>BDI.SD-1.Ada</td>
<td>6.025</td>
<td>1</td>
<td>.014</td>
<td>.080</td>
<td>.108</td>
<td>.956</td>
<td>.022</td>
</tr>
<tr>
<td>BDI.SD-1.Com</td>
<td>10.392</td>
<td>1</td>
<td>.001</td>
<td>.134</td>
<td>.234</td>
<td>.910</td>
<td>.006</td>
</tr>
<tr>
<td>BDI.SD-1.Soc</td>
<td>2.904</td>
<td>1</td>
<td>.088</td>
<td>.040</td>
<td>.071</td>
<td>.956</td>
<td>.108</td>
</tr>
<tr>
<td>BDI.SD-1.Mot</td>
<td>3.063</td>
<td>1</td>
<td>.080</td>
<td>.042</td>
<td>.056</td>
<td>.970</td>
<td>.091</td>
</tr>
<tr>
<td>BDI.SD-1.Cog</td>
<td>8.784</td>
<td>1</td>
<td>.003</td>
<td>.115</td>
<td>.154</td>
<td>.946</td>
<td>.007</td>
</tr>
<tr>
<td>BDI. SD-1.5.Total</td>
<td>5.46</td>
<td>1</td>
<td>.019</td>
<td>.074</td>
<td>.108</td>
<td>1.050</td>
<td>.030</td>
</tr>
<tr>
<td>BDI.SD-1.5.Ada</td>
<td>5.922</td>
<td>1</td>
<td>.015</td>
<td>.079</td>
<td>.106</td>
<td>.957</td>
<td>.023</td>
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</tbody>
</table>

(table continues)
Table 3 (continued).

<table>
<thead>
<tr>
<th></th>
<th>$\chi^2$</th>
<th>df</th>
<th>$p$</th>
<th>Cox &amp; Snell $R^2$</th>
<th>Nagelkerke $R^2$</th>
<th>$e^8$</th>
<th>$P$</th>
</tr>
</thead>
<tbody>
<tr>
<td>BDI.SD-1.5.Com</td>
<td>10.850</td>
<td>1</td>
<td>.001</td>
<td>.140</td>
<td>.218</td>
<td>.921</td>
<td>.004</td>
</tr>
<tr>
<td>BDI.SD-1.5.Soc</td>
<td>2.578</td>
<td>1</td>
<td>.108</td>
<td>.035</td>
<td>.052</td>
<td>.968</td>
<td>.124</td>
</tr>
<tr>
<td>BDI.SD-1.5.Mot</td>
<td>7.762</td>
<td>1</td>
<td>.006</td>
<td>.102</td>
<td>.141</td>
<td>.950</td>
<td>.011</td>
</tr>
<tr>
<td>BDI.SD-1.5.Cog</td>
<td>.679</td>
<td>1</td>
<td>.009</td>
<td>.090</td>
<td>.120</td>
<td>.954</td>
<td>.015</td>
</tr>
<tr>
<td>BDISD-2. Total</td>
<td>8.60</td>
<td>1</td>
<td>.003</td>
<td>.114</td>
<td>.155</td>
<td>1.059</td>
<td>.008</td>
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<td>BDI.SD-2.Ada</td>
<td>6.694</td>
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<td>.010</td>
<td>.089</td>
<td>.120</td>
<td>.954</td>
<td>.016</td>
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<tr>
<td>BDI.SD-2.Com</td>
<td>7.342</td>
<td>1</td>
<td>.007</td>
<td>.097</td>
<td>.140</td>
<td>.944</td>
<td>.013</td>
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<tr>
<td>BDI.SD-2.Mot</td>
<td>4.924</td>
<td>1</td>
<td>.026</td>
<td>.067</td>
<td>.094</td>
<td>.960</td>
<td>.034</td>
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<tr>
<td>BDI.SD-2.Cog</td>
<td>7.199</td>
<td>1</td>
<td>.007</td>
<td>.095</td>
<td>.127</td>
<td>.953</td>
<td>.013</td>
</tr>
</tbody>
</table>

Results of Research Question 4

The fourth research question asked if the demographic background and stress factors would influence the parents' ratings on the BDI-II for children with autism in Taiwan. For the demographic variables (Table 4), fathers (67%) had a significantly higher pass rate in BDI-II with standard deviation of-2 than mothers (32%), $\chi^2(1) = 5.03, p=.025$. There were no significant differences found in the other demographic variables (Child’s age, Adult’s age, Marriage status, SES, and number of children). For the support variables (Table C11), the pass rates for all services received (support from parent group, educational group, religion, relatives/friends, government agency/school, and hospital) were not significantly different. The logistic regression test (Table C12) indicated no significant results on stress level predicting BDI-II.
Table 4

Analysis of Pass rates for BDI-II by Demographic Variables

<table>
<thead>
<tr>
<th></th>
<th>Level</th>
<th>SD-1</th>
<th>X²</th>
<th>SD-15</th>
<th>X²</th>
<th>SD-2</th>
<th>X²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child’s Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boy</td>
<td>16%</td>
<td>1.56</td>
<td>24%</td>
<td>1.64</td>
<td>37%</td>
<td>0.18</td>
<td></td>
</tr>
<tr>
<td>Girl</td>
<td>33%</td>
<td>1.56</td>
<td>44%</td>
<td>0.85</td>
<td>44%</td>
<td>0.09</td>
<td></td>
</tr>
<tr>
<td>Adult’s Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26-35</td>
<td>26%</td>
<td>1.57</td>
<td>33%</td>
<td>0.85</td>
<td>41%</td>
<td>0.09</td>
<td></td>
</tr>
<tr>
<td>36+</td>
<td>14%</td>
<td>2.18</td>
<td>42%</td>
<td>1.64</td>
<td>67%</td>
<td>5.03*</td>
<td></td>
</tr>
<tr>
<td>Adult’s Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>33%</td>
<td>2.18</td>
<td>42%</td>
<td>1.64</td>
<td>67%</td>
<td>5.03*</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>15%</td>
<td>24%</td>
<td>32%</td>
<td>0.09</td>
<td>33%</td>
<td>33%</td>
<td></td>
</tr>
<tr>
<td>Marriage Status</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>19%</td>
<td>0.70</td>
<td>26%</td>
<td>0.07</td>
<td>38%</td>
<td>0.03</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>0%</td>
<td>33%</td>
<td>33%</td>
<td>0.03</td>
<td>33%</td>
<td>33%</td>
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</tr>
<tr>
<td>Social Status</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Upper</td>
<td>16%</td>
<td>0.22</td>
<td>26%</td>
<td>0.00</td>
<td>42%</td>
<td>0.55</td>
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<tr>
<td>Lower</td>
<td>21%</td>
<td>26%</td>
<td>33%</td>
<td>0.55</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Children</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One</td>
<td>15%</td>
<td>3.01</td>
<td>20%</td>
<td>2.52</td>
<td>30%</td>
<td>1.05</td>
<td></td>
</tr>
<tr>
<td>Two</td>
<td>24%</td>
<td>33%</td>
<td>43%</td>
<td>1.05</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Three +</td>
<td>0%</td>
<td>11%</td>
<td>33%</td>
<td>1.05</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p< 0.05, **p< 0.01, *** p<.001

Results of Research Question 5

The fifth research questions asked if the demographic background and stress factors will influence the parent-child relationship as measured by PCRI and reported by parents of children with autism in Taiwan. PCRI and stress level are significantly positively correlated, $r = .362$, $p = .002$. This indicates that an increase in stress score is associated with an increase in the total score of PCRI (Table 5).

Table 5

Correlation Matrix for Continuous Demographic Variables by PCRI

<table>
<thead>
<tr>
<th></th>
<th>Stress Score</th>
<th>PCRI</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCRI</td>
<td>.362**</td>
<td>--</td>
</tr>
<tr>
<td>Stress Score</td>
<td>--</td>
<td>.362**</td>
</tr>
</tbody>
</table>

*p< 0.05, **p< 0.01, *** p<.001
The overall ANOVA was not significant, $F(2, 69) = 1.73, p = .185$. There was no significant difference in PCRI by number of children (Table C13). The analyses of other demographic variables (child’s gender, adult’s gender, adult’s age, marriage status, and SES) showed no significant difference in PCRI (Table C14). For support variables (Table 6), parents who received services or support from a government agency or school ($M = 204.72, SD = 13.88$) had significantly lower PCRI total scores than parents who did not receive services or support from a government agency or school ($M = 218, SD = 10.82$), $t(70) = 3.124$, $p = .003$. Other support variables (support for parent group, educational group, religion, relatives/friends, and hospital) have no significant differences in PCRI scores.

**Table 6**

*Analysis for Support Variables on PCRI*

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parent Group</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between</td>
<td>2.66</td>
<td>1</td>
<td>2.66</td>
<td>.013</td>
</tr>
<tr>
<td>Within</td>
<td>14413.99</td>
<td>70</td>
<td>205.91</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>14416.65</td>
<td>71</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educational Group</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between</td>
<td>.023</td>
<td>1</td>
<td>.02</td>
<td>.000</td>
</tr>
<tr>
<td>Within</td>
<td>14416.63</td>
<td>70</td>
<td>205.95</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>14416.65</td>
<td>71</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Religion</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between</td>
<td>101.12</td>
<td>1</td>
<td>101.12</td>
<td>.494</td>
</tr>
<tr>
<td>Within</td>
<td>14315.53</td>
<td>70</td>
<td>204.51</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>14416.65</td>
<td>71</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relatives or Friends</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between</td>
<td>102.67</td>
<td>1</td>
<td>102.67</td>
<td>.502</td>
</tr>
<tr>
<td>Within</td>
<td>14313.98</td>
<td>70</td>
<td>204.49</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>14416.65</td>
<td>71</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government/School</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between</td>
<td>1764.47</td>
<td>1</td>
<td>1764.47</td>
<td>9.762*</td>
</tr>
<tr>
<td>Within</td>
<td>12652.183</td>
<td>70</td>
<td>180.75</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>14416.653</td>
<td>71</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*(table continues)*
Results of Research Question 6

The sixth research question asked if there a significant difference in the scores of parent-reported stress level when comparing parents in Taiwan and in America. A Mann-Whitney test (Table C15) found that there was no significant difference in stress scores between groups in Taiwan ($M = 42.00$, $SD = 3.64$) and groups in the United States ($M = 43.33$, $SD = 8.49$), $U(16) = 37.00$, $p = .756$.

Results of Research Question 7

The seventh research question asked if the demographic background would influence the stress level of parents of children with autism. Mann-Whitney analyses revealed that fathers ($M = 46.92$, $SD = 4.93$) scored higher on stress level than mothers ($M = 43.22$, $SD = 7.24$), $U(70) = 228.5$, $p = .047$. There was no significant difference in stress scores between other demographic variables.

Table 6 (continued).

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
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<tbody>
<tr>
<td>Hospital</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between</td>
<td>80.45</td>
<td>1</td>
<td>80.45</td>
<td>.393</td>
</tr>
<tr>
<td>Within</td>
<td>14336.20</td>
<td>70</td>
<td>204.83</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>14416.65</td>
<td>71</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p<0.05, **p<0.01, ***p<.001
Table 7

**Analysis of Differences in Stress by Demographic Variables**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Level</th>
<th>Mean Rank</th>
<th>Mann-Whitney</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child’s gender</td>
<td>Boy</td>
<td>37.63</td>
<td>212</td>
</tr>
<tr>
<td></td>
<td>Girl</td>
<td>28.56</td>
<td></td>
</tr>
<tr>
<td>Adult’s age</td>
<td>26-35</td>
<td>37.59</td>
<td>551</td>
</tr>
<tr>
<td></td>
<td>36 and more</td>
<td>35.02</td>
<td></td>
</tr>
<tr>
<td>Adult’s gender</td>
<td>Male</td>
<td>47.46</td>
<td>228.5*</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>34.31</td>
<td></td>
</tr>
<tr>
<td>Marriage status</td>
<td>Married</td>
<td>36.20</td>
<td>82.5</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>43.50</td>
<td></td>
</tr>
<tr>
<td>SES</td>
<td>Lower-Middle</td>
<td>33.61</td>
<td>524.5</td>
</tr>
<tr>
<td></td>
<td>Middle-Upper</td>
<td>39.08</td>
<td></td>
</tr>
</tbody>
</table>

*p< 0.05, **p< 0.01, ***p<0.001

Table 8 indicated that parents in Taiwan who received support from a parent group, such as the PTA or other parent associations, ($M = 42.23$, $SD = 7.06$) feel less stress than parents who did not receive support from a parents group ($M = 45.05$, $SD = 6.82$), $U(70) = 450$, $p = .035$. Parents who received any services or support from a government agency or school ($M = 43.17$, $SD = 7.26$) had lower stress scores than parents who did not receive the services or support from a government agency or school ($M = 47.17$, $SD = 4.57$), $U(70) = 217$, $p = .03$. There were no differences found between other support variables on stress score.
Table 8

Analysis of Differences in Stress by Support Variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Country</th>
<th>Mean Rank</th>
<th>Mann-Whitney</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parent Group</td>
<td>Received</td>
<td>30.52</td>
<td>450*</td>
</tr>
<tr>
<td></td>
<td>None</td>
<td>41.02</td>
<td></td>
</tr>
<tr>
<td>Educational Group</td>
<td>Received</td>
<td>34.78</td>
<td>580</td>
</tr>
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<td></td>
<td>None</td>
<td>38.43</td>
<td></td>
</tr>
<tr>
<td>Religion</td>
<td>Received</td>
<td>40.25</td>
<td>175.5</td>
</tr>
<tr>
<td></td>
<td>None</td>
<td>36.16</td>
<td></td>
</tr>
<tr>
<td>Relatives or Friends</td>
<td>Received</td>
<td>36.14</td>
<td>401</td>
</tr>
<tr>
<td></td>
<td>None</td>
<td>36.59</td>
<td></td>
</tr>
<tr>
<td>Government/School</td>
<td>Received</td>
<td>34.12</td>
<td>217*</td>
</tr>
<tr>
<td></td>
<td>None</td>
<td>48.12</td>
<td></td>
</tr>
<tr>
<td>Hospital</td>
<td>Received</td>
<td>36.36</td>
<td>93.5</td>
</tr>
<tr>
<td></td>
<td>None</td>
<td>39.83</td>
<td></td>
</tr>
</tbody>
</table>

*p< 0.05, **p< 0.01, *** p<.001

Discussion

The purposes of this study were to investigate whether there are significant differences in parental stress and in the parent-children relationships between Taiwan and the United States, and if there is a difference on child development inventory for children who are diagnosed as autistic in these two countries. The study also investigated the impact of the parent-child relationships on the children’s development. The reliability of BDI-II in the Mandarin Chinese version was first tested in this study and used in Taiwan for evaluating a child’s developmental abilities. Furthermore, the influential determinants of parental stress and
the parent-child relationship were explored, as well as the impact of stress on the parent-child relationship in Taiwan.

The Use of BDI-II in Taiwan and for Children with Autism

BDI-II is designed to measure the developmental strengths of children and to screen to determine whether a child is potentially at risk for being developmentally delayed. Chiang (2008) suggested that the establishment of such standardized tools is needed in Taiwan. Cronbach’s alphas is used to measure the internal consistency of BDI-II. The Cronbach's alphas were .906. Cronbach’s alpha reliability coefficient normally ranges between 0 and 1. George and Mallery (2003) provided rules for value of Cronbach’s alpha: “α > .9 = Excellent, α > .8 = Good, α > .7 = Acceptable, α > .6 = Questionable, α > .5 = Poor, and α < .5 = Unacceptable” (p. 231). The BDI-II was found to be highly reliable in this study.

Children with autism between the ages of 2-7 were targeted for this study, with a median age of 60 months. The BDI-II had been used for a previous autistic group study which had 44 children who were diagnosed with autism between ages 2-7, with a median age of 54 months. In that study, children with autism scored lowest on the personal-social and communication domains (Newborg, 2005). The lowest pass rates on BDI-II (in standard deviation -1.5) in this study were also on the personal-social domain (23%) and communication domain (20.8). In addition, the best performance of children with autism in these two studies
was the motor domain. This pattern again concluded the weakness of children with autism, and the BDI-II clearly demonstrated the performance of children with autism.

Influences on Child Development

The results of this study indicated that there were no significant findings for the comparison of pass rate in BDI-II based on the geographic region (Taiwan and the United States). However, when investigating the influences of demographic backgrounds on the pass rate of BDI-II, fathers (67%) had a significantly higher pass rate in BDI-II (with a standard deviation of -2) than mothers (32%), \(X^2(1) = 5.03, p = .025\). There were also no significant differences in pass rates for any BDI-II sub-domain between children with autism in Taiwan and the United States.

Dave, Nazareth, Senior, and Sherr (2008) stated that although the scores from mothers and fathers on the same instrument are correlated, they may report differently on particular domains. Moreover, unlike fathers, mothers tend to have no differences on the gender of their child in their reports (Dave, Nazareth, Senior, & Sherr, 2008). Since the difference of pass rates on parent’s gender only occurred in the standard deviation of -2, it is recommended for future studies to focus on this variable and provide more evidence to determine whether or not the gender of parents has any influence on parent-reported child development inventory. The information provided by parents on children’s development is valuable, but researchers should consider if the evaluation would be more accurate with a single report from either the father or
the mother, or if it needs to be conducted as a combined report.

This study also concluded that the parent-child relationship is a significant predictor of child development for Taiwanese families. Parents play an essential role in shaping the development of their child (Maccoby, 2000). The higher PCRI scores of the participants represent not only a good parent-child relationship, but also a positive parenting attitude. The satisfaction of parenting, level of involvement, communication with children, discipline practices, and capacity to help children with independence in PCRI are associated with the parent-child relationship; whereas the received support, and endorsement of distinct roles that are related to parenting attitude (Coffman, Guerin, & Gottfried, 2006; Mowder, Rubinson, & Yasik, A. E., 2009). Grusec (2006) indicated that positive relationship between parents and children produces positive outcomes on children’s development. Demo and Cox (2000) also emphasized the effects of parenting style on children’s performance and how parenting styles influence the development. Sigelman and Rider (2003) considered parents to be the very first social relationship for children. Lin (2006) also suggested that the relationship with parents would become a model for children to develop relationship with others in the future. The direct causal effect of the parent-child relationship on child development leads us to consider the importance of parents and their parenting skills in helping children with autism.
Influence and Difference on Parent-Children Relationship

Parents in the United States had a better overall parent-child relationship than parents in Taiwan had in this study. The results indicated that parents in the United States have more positive attitudes on satisfaction, involvement, and autonomy. Gau et al. (2010) stated that the parents of children with autism in Taiwan tend to develop more protective and more controlling parenting skills. In a similar study conducted by Lin, Orsmond, Coster, and Cohn (2011), mothers of children with autism in Taiwan reported lower family adaptability and cohesion, and higher depression levels than parents of children with autism in the United States. Another result of this study showed that parents who received the services and support from a government agency or school in Taiwan tended to have great difficulty in parenting skills and a more negative parent-child relationship. Perhaps this finding pertained to the types of services and the quality of support that a government agency or school can provide for a child with autism and his/her family in Taiwan. It is recommended for future study to discuss and evaluate if government agencies and schools in Taiwan has developed effectiveness in program services.

Stress level and parent-children relationship were found to have a significant positive correlation in this study. Unlike the finding in this study, Lessenberry and Rehfeldt (2004) reported that mothers of children with autism have higher stress and lower level of parenting attitude. However, it is important for researchers in Taiwan to focus on the cultural background
and the belief of parents in Taiwan for relevant studies in the future. These studies would see whether the result of a positive correlation between stress level and the parent-child relationship occurs particularly in Taiwanese parents, and could also explore the factors that may affect stress and parent-children relationships.

*Influences of Parental Stress Level*

Over 70% of parents in Taiwan reported that their finances, health, time demand, and emotional well-being were negatively impacted when they have children with autism. The opportunities for finding a job or maintaining attendance at work was also negatively impacted. Some parents even have to stay at home full time in order to take care of their children with autism or spend time in therapy sessions. About 50% of parents in Taiwan considered having a child with autism as a positive impact on their relationship with their children with autism while only 19% of parents reported it as a negative impact. It was interesting that some parents in Taiwan stated that an elder in family as a cause of stress because the elder may not understand autism and may discourage parents to bring their child to any therapy or intervention since there is no immediate improvement occurred.

The results of the father having higher stress levels than the mother were not consistent with previous studies, which had reported that mothers had higher stress and depression in a family with children with autism (Davis & Carter, 2008; Hastings, Kovshoff, Ward, et al., 2005).
However, Gau (2010) indicated that fathers in Taiwan “may be less likely to accept having a child with autism” (p.76). Chao (1994) stated that parents in Taiwan have a great focus on the academic outcome and hierarchical relationship of their children. In a traditional Taiwanese family, parents (usually the father) have great authority in the family, and it is unchallenged. The context of Chinese culture leads fathers to the responsibility of not only himself, but every family member. To maintain the honor of the family may become a stress factor for fathers in Taiwan. In addition, mothers may be more willing to seek help than fathers. The results of this study showed that mothers had a significantly higher rate of receiving support or services from either government agencies or schools than fathers in Taiwan. Another possible reason for mothers seeking help more often than fathers may be that mothers of children with autism were more likely to stay home and take care of their children full-time (Montes & Halterman 2008; Warfield, 2001).

The findings of this study also indicated a significant difference in stress level between parents who have received support from a parent group (such as, PTA or other parent associations) and/or a government agency or school and parents who did not receive those supports. Parents who asked for the services of a parent group and/or government agency (including school) reported less stress than parents who did not. Theule, Wiener, and Rogers (2011) emphasized the importance of social support on moderating stress levels for parents of
children with special needs. Dunn, Brubine, Bowers, and Tantleff-Dunn (2001) also stated that social support is effective in reducing stressors for parents of children with autism.

Recommendations and Conclusions

This study provides an alternative instrument to measure child development for children in Taiwan. It has demonstrated the reliability of the BDI-II in assessing children with autism in Taiwan. Using the BDI-II as a parent-reported child development inventory in this study provided an example of how parents are able to observe their children with an accurate instrument at home. Not only does the BDI-II provide a guide to help parents notice their child’s differences, it also gives parents a chance to screen their children at home, especially for parents in Taiwan who tend to not seek help or are hesitant to admit that their children have autism (Gau, 2010). They will better understand what development milestones their children are expected to reach at certain ages, and this will hopefully lead them seeking support and/or further diagnosis.

Regarding the fact that parents in the United States have a more positive parent-child relationships and parenting attitudes, researchers in Taiwan can explore the services and support that have been provided to parents in the United States, in order to develop effective services or programs for parents in Taiwan. In order to fully help children with autism in Taiwan, it is important to study families and parents as well. Boyd (2002) suggested interventions for
not only children with autism, but also their parents, in order to help the parents monitor their stress level. Services and support that meet the needs of parents in a family with children with autism need to be provided. One such example can include parenting courses to enhance the parent-child relationship or a parental support network, which can help parents with autism connect with community resources or any other assistance.

Having children with autism indeed causes certain stresses for the family. Parents of children with autism have three times the stress and life disruptions than parents of non-autistic children (Benjak, Mavrinac & Simetin, 2009). Services provided by professionals to children with that may be developmental delayed, with a consideration of parental stress would be essential in helping parents cope with stress and improve the parent-child relationship (Lessenberry & Rehfeldt, 2004). With the increase in the prevalence of autism, it is urgent to raise awareness of autism and develop comprehensive support for children with autism and their families.
APPENDIX A

EXTENDED LITERATURE REVIEW
Historical Study and Definition of Autism

Historically, ancient and medieval cultures failed to recognize autism as a disorder. Information on the disorder emerged around 60 years ago (Boutot & Myles, 2011). Autism was originally documented as “early infantile autism” by Leo Kanner in 1943 (Kanner, 1943). Kanner used the term "autism" in his publication evaluating eleven children with characteristics related to the modern definition of autism. He noted the social difficulties in them caused by language problems and abnormal behavior. In addition, while measuring language function, three of eleven children were observed to be mute. The remaining eight children showed speech impairments and failed to speak to others. Abnormal language usage was characterized by immediate and delayed echolalia, repetition, extreme literalness, and reversal of pronouns (Kanner, 1943). In 1980, autism was added to the Diagnostic Statistical Manual (DSM) published by the American Psychiatric Association (APA). In 1990, the Individuals with Disabilities Education Act (IDEA) recognized autism as one of the thirteen disabilities under which a student can be eligible for special education services.

The Diagnostic Statistical Manual of Mental Disorders (DSM-IV) system outlines pervasive developmental disorders (PDDs), as a group of disorders characterized by delays in the development of social interactions and communication skills. The manual includes autism, Asperger’s disorder, Rett’s disorder, childhood disintegrative disorder, and pervasive...
developmental disorder- not otherwise specified (PDD-NOS) (American Psychiatric Association, 2000). Among these five disorders, autism, Asperger’s disorder, and PDD-NOS are commonly grouped in a sub-category called autism spectrum disorders (ASD). Asperger’s Disorder (also known as Asperger syndrome), was first identified by Hans Asperger as condition similar to autism in 1994 (Wall, 2009). The major difference between autism and Asperger’s disorder is that children with Asperger’s disorder do not show the language and cognitive delays of children with autism (Lord, Cook, Leventhal, & Amaral, 2000). The third group of autism spectrum disorder is PDD-NOS, which is recognized when children do not meet the criteria for autism or Asperger’s disorder. In contrast to autism, children with Asperger’s disorder experience social difficulties without a language delay. Siegel (1996) summarized that individuals with Asperger’s disorder have more mild impairment and higher IQs than children with autism. However, it is sometimes difficult to identify Asperger’s disorder and high-functioning autism (Boutot & Mylers, 2011). By understanding the genetic makeup and brain neurochemistry, the similarities and differences between autism and Asperger’s disorder are recognized. However, the criteria in treating and identifying the two disorders remain the same (Yapko, 2003).

The Diagnostic and Statistical Manual of Mental Disorders, fourth edition, text revision (DSM-IV-TR, American Psychiatric Association, 2000) defines the criteria for autism spectrum disorders (ASD), which are used in diagnosing autism in both Taiwan and U.S.:
(I) a total of six (or more) items from (A), (B), and (C), with at least two from (A), and one each from (B) and (C).

(A) Qualitative impairment in social interaction, as manifested by at least two of the following:

1. Marked impairments in the use of multiple nonverbal behaviors such as eye-to-eye gaze, facial expression, body posture, and gestures to regulate social interaction
2. Failure to develop peer relationships appropriate to developmental level
3. A lack of spontaneously seeking to share enjoyment, interests, or achievements with other people, (e.g., by a lack of showing, bringing, or pointing out objects of interest to other people)
4. Lack of social or emotional reciprocity (note: in the description, it gives the following as examples: not actively participating in simple social play or games, preferring solitary activities, or involving others in activities only as tools or "mechanical")

(B) Qualitative impairments in communication as manifested by at least one of the following:

1. Delay in, or total lack of, the development of spoken language (not accompanied by an attempt to compensate through alternative modes of communication such as gesture or mime)
2. In individuals with adequate speech, marked impairment in the ability to initiate or sustain a conversation with others
3. Stereotyped and repetitive use of language or idiosyncratic language
4. Lack of varied, spontaneous make-believe play or social imitative play appropriate to developmental level

(C) Restricted repetitive and stereotyped patterns of behavior, interests and activities, as manifested by at least two of the following:

1. Encompassing preoccupation with one or more stereotyped and restricted patterns of interest that is abnormal either in intensity or focus
2. Apparently inflexible adherence to specific, nonfunctional routines or rituals
3. Stereotyped and repetitive motor mannerisms (e.g. hand or finger flapping or twisting, or complex whole-body movements)

4. Persistent preoccupation with parts of objects

II. Delays or abnormal functioning in at least one of the following areas, with onset prior to age 3 years:

(A) Social interaction

(B) Language as used in social communication

(C) Symbolic or imaginative play

III. The disturbance is not better accounted for by Rett’s disorder or childhood disorder.

Bernard Rimland, the founder of the Autism Society of America and President of the Autism Research Institute (ARI), has systematically examined the ARI database and stated two clear tendencies. First, the growth rate of cases of autism has remarkably increased, the numbers having exploded in recent years. Secondly, there has been a shift of the inception time, or the time that autistic symptoms become noticeable (Edward Yazbak, 2003). Parents are reporting a similar increase in numbers. Parents report that a child is developmentally, socially, and verbally on a suitable track for his/her age, and suddenly stops learning new words in the second year of life. Then parents report limited speech, cognitive abilities, and social interaction.

The Cause of Autism

There has been an increase in the number of individuals with autism. This increase is likely due to a combination of factors. As the definition of autism is modified, more children fall
under the classification. A more comprehensive diagnosis is possible as a result of increased knowledge about the disorder. As far as causes of autism are concerned, most researchers believe that the cause is most likely a result of genetic and environmental factors (Well, 2010).

A series of unbalanced genes may interfere in brain development resulting in autism. Sometimes problems occurring during delivery can also lead to autism (Gillberg, 1998).

Environment also appears to play an important role in the occurrence of autism. Factors contributing to the disorder include infections, contact with environmental chemicals, metabolic imbalances, and harmful substances ingested during pregnancy (Johnson & Myers, 2007).

Doctors continue research to gain a better understanding of the causes of autism, but the disorder appears to be related to a blend of heredity, external environment, and brain malfunction. This disorder has appeared to be the most genetic when compared to all other psychiatric disorders (Ramoz, et al., 2004). Torppa (2009) described autism as a neurological disorder that creates dysfunction in the way the brain processes information, and as the most serious disorder in childhood. It develops within the initial 2½ years of life, and is more often observed within the first 4 months. Boys are more often affected by autism than girls (Torppa, 2009).

Characteristic of Children with Autism

Generally, autism is regarded as a disorder that occurs during brain development,
impairing communication and social interaction. Other main symptoms include restricted and repetitive. Ramoz et al. (2004) explains autism in a similar manner by describing it as a severe neurodevelopment disorder signified by a discrepancy and inconsistency in verbal and nonverbal communication, impairments in mutual social interactions, and a prototype of repetitive or stereotyped behaviors. Adams, Edelson, Grandin, and Rimland (2004) have illustrated autism as a developmental disability that characteristically entails impediments and mutilation in language, behavior, and social skills. This spectrum has different effects on different people. Children with autism may not always have the same symptoms. Children might exhibit several other symptoms and characters that vary in wide ranges of behaviors and degrees of severity (Torppa, 2009).

The National Institute of Neurological Disorders and Stroke (2010) explains that autism is mainly characterized by three different behaviors. Children with autism usually show problems with social interaction, display problems with verbal and nonverbal communication, and demonstrate repetitive behavior and obsessive interests. These behaviors may vary in effect from mild to disabling. Autism ranges broadly in its symptoms and severity, causing it to remain unidentified, especially in mildly affected children. Children with autism have a plethora of deficits, including late and abnormal language development, lack of social interest, and inappropriate behavior. Children with autism often have a poor understanding of language and
no social interest. These children appear rigid and are resistant to change. They often engaging in self-stimulatory behaviors and have sensory issues, such as being overly-sensitive to light, sound, touch, or smell. Children with autism are often good at visual-spatial skills, while experiencing difficulty with language-based tasks (Stephens, 2003). Although Kanner's first identification of autism didn't include brain dysfunction as a cause, it is now documented that autistic disorders can be caused by a number of conditions that negatively affect brain development including tuberous sclerosis, fragile X syndrome, neurofibromatosis, and postnatal herpes (Harris, 1998; Pierangelo & Giuliami, 2008). Current diagnostic schema point out that the onset of symptoms occur before 3 years of age (American Psychiatric Association, 2000).

Autism initially appears during infancy and childhood. Symptoms of autism typically start after 6 months of age, and become engrained in the child’s developmental pattern at 2 or 3 years of age (Rogers, 2009). The symptoms continue through adulthood (Rapin & Tuchman, 2008). Autism is distinguished from other disorders in many ways, including impairment in social interaction, communication, and repetitive behavior. Autistic behavior has other symptoms such as unusual ways of eating, which is a extremely prominent but not necessarily a symptom to use for diagnosis (Filipek, et al., 1999). Generally, a child with autism may have following symptoms: rare eye contact, improper facial expressions, unusual body pose, and gestures. Children with autism tend to talk less, and don’t attempt to participate in
conversations. These children have a lack of interest in events and in their surroundings.

Children with autism are highly likely to concentrate on their own repetitious actions while showing limited interest in people (Torppa, 2009). Autism affects language and social development differently and, therefore, two children with autism will not display the same exact characteristics. The most common displays are general patterns like social, language, and cognitive impairments. Children with autism usually have problems in different core areas such as socialization, communication, and restricted models of behaviors and interests.

Ruble and Gallagher (2004) indicated that children with autism often have difficulty in understanding and responding to verbal information and commands. They also have troubles following standard social rules, which may affect their social skills and interaction with others. Moreover, they are often inflexible in organizing free time and have difficulty performing more than one task at a time. Another characteristic of children with autism is the varying responses to sensory experiences (Pierangelo & Giuliani, 2008). For example, a child might have only a slight problem learning to read, but shows enormously poor social interaction. Children with autism do not follow the usual model of child development. In some children, examples of future issues could be obvious from birth. In most cases, the issues with communication and social skills become clearer when comparing the child with other children of the same age. A teacher or daycare provider may initially believe that a child will soon catch up to his/her peers,
and therefore, optimistically ignore the possible presence of autism.

Poerangelo and Giuliami (2008) summarized some possible early indicators of autism spectrum disorders (p.10):

- Delay or absence of spoken language
- Looks through people; not aware of others
- Not responsive to other people's facial expressions/feelings
- Lack of pretend play; little or no imagination
- Does not show typical interest in or play near peers purposefully
- Lack of turn taking
- Unable to share pleasure
- Qualitative impairment in nonverbal communication
- Does not point at an object to direct another person to look at it
- Lack of gaze monitoring
- Lack of initiation of activity of social play
- Unusual or repetitive hand and finger mannerisms
- Unusual reactions or lack of reaction to sensory stimuli

Social impairment, communication skills, repetitive behaviors and restricted interests are the major characteristics of autism. These characteristics and some signs are discussed separately to understand the features of each characteristic.

*Social Signs*

Children with autism are unable to comprehend the intended meaning of social signs like smiles, winks, or grimaces (American Psychiatric Association, 2000). These children
understand the meaning of words, but are unable to identify the meaning of people’s gesture, such as a smile or a request to hug. An inability to process social situations makes it difficult for children with autism to live normally in society. This situation becomes more complex when these individuals are unable to see the world from another’s perspective.

Social Interaction

Normally an infant is a developing, social being and gazes at people, responds to voices, holds fingers, and smiles during early infancy. Children with autism tend to experience great difficulty in learning social interaction (Powers, 2000). Children with autism usually have problems with interaction in their early months and will even avoid eye contact. They show a dislike for and a resistance to attention or hugging. Later, they seldom look for comfort or reply to parents’ displays of annoyance or warmth in a typical manner. Boutot & Myles (2011) suggested that while these children are attached to their parents, their patterns of affection are different making it difficult to understand their emotions. To parents, it may feel that their child is not attached to them while that is not the actual case. Parents usually look forward to the excitement of hugging, playing, and teaching their child, but the behavior of a child with autism is extremely disappointing for parents. In turn, developing social relationships with peers becomes difficult. They have a tendency to easily lose control, especially when they are in an unusual or irresistible environment that disrupts and annoys the child (Pierangelo & Giuliani,
They may destroy things, attack others, or hurt themselves. In the frustration, children with autism spectrum disorders may intentionally hit their heads, pull their hair, or bite their arms.

Language Development

A normal child passes the first milestones of the expected language path by first learning to babble. A toddler by the age of one usually speaks words; responds to voices, especially his/her name; points at the objects; and expresses him/herself through a variety gestures (Oates & Grayson, 2004). Children with autism unpredictably remain mute throughout their lives until identified and treated. Some of them babble in earlier life, but unexpectedly stop doing it later or have delay in language development. They are incapable of combining words into meaningful sentences. Some of them can speak a single word, and others just repeat a single phrase over and over again (Kluth, 2009). They cannot continue the conversation, although they regularly maintain a monologue on a favorite subject. Inability to understand body language is another difficulty for children with autism. They fail to realize and comprehend the tone of voices and language of phrases. They may infer a mocking expression as a response. Sometimes it is difficult to understand their gestures or speech. Their facial expressions and movements do not coincide with what they might say. Their voice tone fails to match their emotions. A sharp, polite or flat, robot-like voice is very common in children with autism. Some
children with rather high-quality language skills speak like miniature adults, unable to carry on “kid-speak” that is common with their peers (Boutot & Myler, 2011). As a result of the inability to express themselves through meaningful language and gestures, children with autism make it difficult for others to understand what they really need or want.

**Repetitive Disorder**

Another characteristic observed in autism spectrum disorder is the repetitive disorder (Bodfish, Symons, Parker, & Lewis, 2000). These individual may have repetitive motor movements or rigid and repetitive patterns of behaviors. These behaviors can sometimes be extreme and very visible, aiding with discovery. The most common repetitive behaviors are hands or arms flapping and walking on the toes (Yapko, 2003). A child with autism may line up their toys rather than using them to play. Children with autism demand consistency in their environment. They are obsessed with their objects and toys, and if somebody moves the toys, the upset can be grave. Even a minor change in their routine can cause depression (South, Ozonoff, & McMahon, 2005). They often prefer similarity and stability in a world that is highly confusing to them. This repetitive behavior becomes a persistent and extreme preoccupation (Volkmar, 2000). They do not engage in imaginative play. Play becomes stereotypical and repetitive for children with autism (Wall, 2009). Some key interests are similar among children with autism, such as trains, weather, and animals (Kluth, 2009).
Diagnosis Process and Instrument

Autism is diagnosed in children on the basis of behaviors rather than a basis on medical tests. To precisely diagnose autism, the child must undergo a widespread assessment by a professional therapist who is able to deal with development of language, behavioral, and social skills in children. Skilled and experienced personnel can diagnose autism between the ages of 24 and 30 months in children (Yapko, 2003). Early intervention services may be given to children with autism based on the early identification. The immediate referral for authentic assessment and evaluation is important at an early age. Specific intervention services of Autism Spectrum Disorder are reliant upon developmental observation, screening, analytic assessment and evaluation for treatment planning. Specific remarkable clinical signs can assist with identifying children at risk for developmental delay or Autism Spectrum Disorder. For instance, the Idaho Department of Education Special Population Services (2005) has the following indicators, which are used through routinely in developmental observation procedures when children visit:

- Low babbling by 12 months of age
- Pointing gestures like showing
- No waving and reaching by 12 months of age
- Speaking no words by the age of 16 months
- No meaningful two-word phrases by the age of 24 months
• Loss of speech, babbling, or social skills at any age

Limited and short exposure and little experience and training can cause a practitioner to have difficulty diagnosing the disorder because of the wide variety of symptoms in children with autism. Wall (2009) stated that professionals involved in the process of diagnosing autism are varied due to the availability of services in each authority. There are multidisciplinary ways to identify a child with autism and having a multidisciplinary team identifying autism will yield more accurate results. A team might include a neurologist, a developmental pediatrician and psychologist, a language therapist, and a professional expert of autism. There is a wide range of numerous tools used during the identification process. The tools are designed for an appropriate and accurate diagnosis process.

For screening a child with autism, a homogeneous screening instrument should be used at any point when concerns about autism are raised instinctively by either a parent or after a clinician observation (Gupta et al., 2007). This assessment includes social and emotional milestones as important factors, in addition to the traditional motor, language, and problem-solving milestones (Johnson & Blasco, 1997). After completing the screening tool process, the pediatrician proceeds to the next step, which is designed to educate and provide awareness for the parents if the result is negative. If the result of the screening is positive, meaning two or more risks factors are found, immediate actions are required. The pediatrician
must consider that a negative screening result could mean that the child may have another developmental disorder that needs additional investigation and resource recommendations. Identification processed become extremely challenging for pediatricians if behavioral symptoms are not severe or they are associated with other disorders.

Figure A1. Pediatric developmental screening flowchart in the United States (Centers for Disease Control and Prevention, 2010).
If a child under the age of three is suspected of having any delay in the developmental process or is at risk, the pediatrician must recommend an early intervention program. If child is diagnosed at the age of three or older, the recommendation would be made to the special education department in the local school. Once a child is enrolled in early childhood intervention, diagnoses should be performed by team of specialists with expertise in autism. The team who assess the child suspected of having autism disorder comprises of professionals and occupational therapists. The team is able to develop an ideal intervention plan (Bruder, 2010). The pediatric developmental screening process in the United States is explained in Figure A1.

Chiang (2008) stated that studies about autism in Taiwan are based on the theories found in international works or the interventions developed in the United States. The Ministry of the Interior in Taiwan (2006) emphasized five stages of early intervention, including general screening by parents, social welfare or other agencies; notification to early intervention center; referral; team evaluation; and intervention plan. Unlike the United States, the intervention and identification in Taiwan rely heavily on the early intervention notification, referral and case management center and center of team evaluation established in every county and city. However, the Early Intervention Notification, Referral and Case Management Center does not start functioning until parents or guardians of the child, health and education agencies or other
related services to the child have expressed concern on the child’s developmental delay and report the concern (Ho, 2008). The operation procedure in Taiwan is explained in the Figure A2.

Figure A2. Screening and early intervention system in Taiwan (Kuo & Chwo, 2004; Chen, 2010; Ho, 2009).

The criterion of DSM IV text revision is used to diagnose a child with autism. The American Academy of Pediatrics (2001) released a policy statement expressing the need for
physicians to apply developmental surveillance with standardized developmental screening and identify those children at risk for autism. Sand, et al. (2005) summarized the two keys recognized while screening: the intensity of screening and the extent of screening. Robins and Dumont-Mathieu (2006) explained the two levels of screening tools according to the breadth of instrument. In level one, screening tools are used for the general population to evaluate if a child is at risk for developmental delays, while level 2 instruments are more autism-specific.

Level 1 instruments are usually used in pediatric and primary care practices, and level 2 tools are most likely to be implemented by professionals who can take parent reports into consideration.

Table A1

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Age Range</th>
<th>No. of Items</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ages &amp; Stages Questionnaires (ASQ)</td>
<td>4-60 mo.</td>
<td>19</td>
<td>General developmental screening tool. Parent-completed questionnaire. Risk categorization (pass/fail)</td>
</tr>
<tr>
<td>Battelle Developmental Inventory Screening Tool, 2nd ed. (BDI-II)</td>
<td>0-95 mo.</td>
<td>100</td>
<td>General developmental screening tool. Quantitative; scaled scores</td>
</tr>
<tr>
<td>Parents’ Evaluation of Developmental Status (PEDS)</td>
<td>0–96 mo.</td>
<td>10</td>
<td>General developmental screening tool. Parent-interview form Risk categorization</td>
</tr>
<tr>
<td>Communication and Symbolic Behavior Scales (CSBS)</td>
<td>6–24 mo.</td>
<td>24</td>
<td>Standardized tool for screening of communication and symbolic abilities</td>
</tr>
<tr>
<td>Pervasive Developmental Disorders Screening Test-II (PDDST-II), Stage 1</td>
<td>12-48 mo.</td>
<td>22</td>
<td>Parent-completed questionnaire. Risk categorization (pass/fail). Stage 1 is for primary care screener</td>
</tr>
</tbody>
</table>
Lord and Corsello (2005) pointed out that the “parent report may be more valid and reliable for certain behaviors during the evaluation” (p.732). Some commonly used instruments in level 1 and 2 are described in the following tables, but this is not an exhaustive list (American Academy of Pediatrics, 2006; Robins & Dumont-Mathieu, 2006; Lord & Corsello, 2005). Table A1 and A2 summarized some examples of screening tools and diagnostic tools.

Table A2

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Age Range</th>
<th>No. of Items</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Checklist for Autism in Toddlers (CHAT)</td>
<td>18–24 mo.</td>
<td>14</td>
<td>Parent-completed questionnaire and observation by health professionals. Risk categorization (pass/fail)</td>
</tr>
<tr>
<td>Modified Checklist for Autism in Toddlers (M-CHAT)</td>
<td>16–48 mo.</td>
<td>23</td>
<td>Parent-completed questionnaire. Risk categorization (pass/fail)</td>
</tr>
<tr>
<td>Pervasive Developmental Disorders Screening Test-II (PDDST-II), Stage 2 &amp; 3</td>
<td>12–48 mo.</td>
<td>14/12</td>
<td>Stage 2 is developed for use in developmental clinics and stage 3 is for autism-specific clinics</td>
</tr>
<tr>
<td>Screening Tool for Autism in Two-Year-Olds (STAT)</td>
<td>24–35 mo.</td>
<td>12</td>
<td>Directly administered tool; Risk categorization. assesses behaviors in 4 social-communicative domains: play, requesting, directing attention, and motor imitation</td>
</tr>
<tr>
<td>Childhood Autism Rating Scale (CARS)</td>
<td>Over age 2</td>
<td>15</td>
<td>Rating scales completed by the clinician</td>
</tr>
</tbody>
</table>

Many children in Taiwan did not get help from early intervention or be recognized as
autism and the most probable reason might be the lack of culturally appropriate developmental screening instruments in Taiwan (Tsai, McClelland, Pratt, & Squires, 2006). Taiwanese researches also suggested a more competent two-stage screening technique (Chien, Huang, & Lung, 2009). The most commonly used translated instruments for autism children in Taiwan are the Clancy Behavior Scale (CBS) and the Childhood Autism Rating Scale (CARS). The Clancy Behavior Scale was first developed 1969, and translated and revised by Taiwanese researches in 1972 with only 14 questions. Additionally, the CARS is a brief assessment based on five prominent systems with 15 questions for diagnosing autism. Chang and Wang (2005) developed and examined the validity of the Development of Behavioral Scale for Children with Autism (BSCA), which is designed for children with autism in Taiwan to measure the three major attributes: social interaction, communication, and restricted repetitive behaviors. Table A3 compares the current translated instrument used in Taiwan and the Battelle Development Inventory used in this study.

Unlike the Battelle Developmental Inventory, the Clancy Behavior Scale, Childhood Autism Rating Scale, and The Development of Behavioral Scale for Children with Autism have fewer questionnaire items and cover less developmental domains (Relline, Tortolani, Trillo, Carbone, & Montecchi, 2004). Hu (1991) indicated that by using the Clancy Behavior Scale, other disabilities may be misclassified as autism due to the deficiency of criteria items.
<table>
<thead>
<tr>
<th>Instrument</th>
<th>Age Range</th>
<th>No. of items</th>
<th>Construct</th>
<th>Content Scoring /Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clancy Behavior Scale (CBS)</td>
<td>24-60 mo.</td>
<td>14</td>
<td>-----</td>
<td>Scaled scores in three domains: Communication, Social interaction, Abnormal Behavior</td>
</tr>
<tr>
<td>Childhood Autism Rating Scale (CARS)</td>
<td>Over age 2</td>
<td>15</td>
<td>DSM-III-R</td>
<td>The 15 items in the scale are: Relating to people; Imitative behavior; Emotional response; Body use; Object use; Adaptation to change; Visual response; Listening response; Perceptive response; Fear or anxiety; Verbal / Non-verbal communication; Activity level; Level and consistency of intellective relations; General impressions.</td>
</tr>
<tr>
<td>The Development of Behavioral Scale for Children with Autism (BSCA)</td>
<td>3-15</td>
<td>50/47/47</td>
<td>ICD-10 DSM-IV</td>
<td>A 4-point Likert’s checklist that is designed to evaluate a subject’s characteristics in three major attributes: social interaction, communication, and restricted repetitive behaviors. The instrument includes three stages for ages 3-6, 6-7, 8-15. The items have slight differences in three stages.</td>
</tr>
<tr>
<td>Battelle Developmental Inventory Screening Tool, 2nd ed. (BDI-II)</td>
<td>0-95 mo</td>
<td>100</td>
<td>DSM-IV</td>
<td>Scaled scores in five domains: personal-social, adaptive, motor, communication, and cognitive development; results in pass/fail score and age equivalent; can be modified for children with special needs</td>
</tr>
</tbody>
</table>

The Childhood Autism Rating Scale has the limitation of being used only by a well-trained
professional. Chang and Wang (2005) also reported that although the Childhood Autism Rating Scale is easy to assess since it only has 14 items, the reliability and validity are major concerns when a child has better ability or is older in the evaluation.
Purpose of the Study

The purposes of this study are to investigate whether there are significant differences in the autism diagnosis criteria between Taiwan and the United States, and the differences in the parent-child relationship between families in Taiwan and the United States. The research determines if there is any relationship between parent-children relationship and the results of a self-reported developmental inventory of their children. More precisely, the study is the first to validate the Battelle Developmental Inventory, 2nd Edition for (BDI-II) use in Taiwan for evaluating a child’s developmental abilities in adaptive, personal-social, communication, motor, and cognitive domains as indicated through information provided by parents or primary caregivers. In addition, the study is intended to explore the influential determinants of diagnosing children with autism, parent-children relationship, and stress experiences that were reported by the parents. The research also assess how stress shapes the quality of parent relationships with their children and the results of development inventory, and whether there are significant differences in parental stress between parents of children with autism in Taiwan and the United States. We will use these results to help identify suggestions for future policy, research, and services with an emphasis on meeting the needs of children with autism and their families in the United States and Taiwan.
Definition of the Terms

There are four important terms used throughout this study: autism, diagnostic criteria, developmental milestones, and parent-child relationship.

**Autism**

The term “autism” is often used to several pervasive developmental disorders, commonly grouped as “Autism Spectrum Disorders”, including autism disorder, Asperger’s disorder, and Pervasive developmental disorder not otherwise specified (PDD-NOS) (American Psychiatric Association, 2000). The criterion of children with autism in this study refers to the child who has been diagnosed as Autism Spectrum Disorders in either Taiwan or the United States. In both countries, the diagnosis is based on The Diagnostic Statistical Manual of Mental Disorders system.

**Parents**

Parents who participated in this study refer to the primary caregivers of children with autism.

**Developmental Milestones**

“Developmental milestones are tasks, abilities, and functional skills that a child should be able to demonstrate within a specific age-range” (Markusic, 2009). When a child does not reach the developmental milestones, he or she may have developmental delays. The five
domains used in this study as the classification of developmental milestones are based on the Battelle Developmental Inventory, 2nd Edition, including adaptive behavior, personal-social skills, communication, motor ability, and cognition.

Parent-Child Relationship

The term parent-child relationship refers to parents’ attitudes toward parenting and their children. “Parent” in this study refers to the primary caregivers of children with autism. Parent-child relationship is evaluated and discussed based on the following scales measured by Parent-Child Relationship Inventory (Coffman, Guerin, & Gottfried, 2006):

- **Satisfaction with parenting**, the degree of gratification derived from being a parent;
- **Involvement**, the level of engagement and familiarity with the child;
- **Communication**, how capably a parent communicates with his or her child;
- **Limit setting**, a parent’s perception of the effectiveness of discipline practices utilized;
- **Autonomy**, the parent’s capacity to facilitate his or her child’s independence.

Research Question

The research will compare and evaluate the different results of parent-child relationship and scores on the development inventory in both Taiwan and the United States. Additionally, the research will evaluate the impact of parent-child relationship on parents’ assessment of their children and other influences which affect parent-child relationship.
Question 1: What are the differences, if any, in the scores on the BDI-II of children who have been diagnosed with autism in Taiwan and U.S.?

Question 2: What are the differences, if any, in parent-child relationship as measured by Parent-Child Relationship Inventory between children with autism in Taiwan and U.S.?

Question 3: What is the relationship, if any, between parent-child relationships as measured by the Parent-Child Relationship Inventory and the parents’ ratings on the BDI-II in Taiwan?

Question 4: What are the demographic background and stress factors that influence the parents’ ratings on the BDI-II for children with autism in Taiwan?

Question 5: What are the demographic background and stress factors that influence parent-child relationships as measured by Parent-Child Relationship Inventory in Taiwan?

Question 6: What are the differences, if any, in the stress levels when comparing parents in Taiwan and U.S.?

Question 7: What are the demographic background variables that influence parents’ stress in Taiwan?
Table C1

*Frequencies and Percentages of Demographic Variables*

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Table C2

*Frequencies and Percentages of Support (Service) Variables*

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<td></td>
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<td>%</td>
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<tr>
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</table>
Table C3

**Frequencies and Percentages of Stress Impact level**

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<td><strong>%</strong></td>
<td><strong>n</strong></td>
<td><strong>%</strong></td>
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<tr>
<td>Health</td>
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<td>Negative impact</td>
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<td>Positive impact</td>
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<td>Emotion</td>
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<td>Relationship with child with autism</td>
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Table C4

Frequencies and Percentages of Pass Rate on BDI (Total and Each Domain)

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Table C5

*Means and Standard Deviations of Stress Score*

|                               | Taiwan Group |                  | Match Sample |                  |
|                               | n            | Mean     | SD     | n            | Mean     | SD     |
| Total stress score            | 72           | 43.83    | 7.017  | 18           | 42.67    | 6.371  |
| Health                        | 72           | 1.57     | .624   | 18           | 1.56     | .616   |
| Emotion                       | 72           | 1.40     | .744   | 18           | 1.22     | .548   |
| Relationship with child with autism | 72     | 2.24     | .847   | 18           | 2.50     | .786   |
| Relationship with other children | 72       | 1.96     | .705   | 18           | 2.00     | .767   |
| Relationship between children | 72           | 2.08     | .765   | 18           | 2.00     | .840   |
| Relationship with spouse      | 72           | 1.88     | .838   | 18           | 2.22     | .878   |
| Relationship with relatives   | 72           | 1.76     | .639   | 18           | 1.72     | .752   |
| Relationship with friends     | 72           | 1.99     | .682   | 18           | 1.61     | .698   |
| Family integration            | 72           | 1.94     | .785   | 18           | 1.83     | .857   |
| Self social life              | 72           | 1.64     | .659   | 18           | 1.28     | .461   |
| Family social life            | 72           | 1.72     | .676   | 18           | 1.444    | .705   |
| Time demand                   | 72           | 1.18     | .454   | 18           | 1.22     | .548   |
| Financial                     | 72           | 1.35     | .585   | 18           | 1.22     | .428   |
| Job                           | 72           | 1.36     | .539   | 18           | 1.44     | .616   |
| Religious                     | 72           | 2.04     | .638   | 18           | 2.17     | .786   |
| Self view                     | 72           | 2.07     | .793   | 18           | 2.08     | .725   |
Table C6

*Means and Standard Deviations of PCRI (Taiwan Group and Match Sample)*

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Table C7

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<td></td>
<td>United States</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>SD-1.5.Ada</td>
<td>Taiwan</td>
<td>44%</td>
<td>1.000</td>
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<td></td>
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<td>33%</td>
<td></td>
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<tr>
<td>SD-1.5.Soc</td>
<td>Taiwan</td>
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<td>1.000</td>
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</tr>
<tr>
<td></td>
<td>United States</td>
<td>22%</td>
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</tr>
<tr>
<td>SD-1.5.Com</td>
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<td>1.000</td>
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<tr>
<td></td>
<td>United States</td>
<td>33%</td>
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<td></td>
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<td>33%</td>
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<td>1.000</td>
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<td>SD-2.Com</td>
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<td>1.000</td>
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<td>1.000</td>
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Table C9

*Mann-Whitney U for Differences in BDI-II Five Domain Scores between Countries*

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Country</th>
<th>Mean Rank</th>
<th>Mann-Whitney</th>
<th>p</th>
</tr>
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<tr>
<td>BDI.Adaptive</td>
<td>Taiwan</td>
<td>10.56</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>United States</td>
<td>8.44</td>
<td>31.00</td>
<td>.399</td>
</tr>
<tr>
<td>BDI.Personal-Social</td>
<td>Taiwan</td>
<td>9.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>United States</td>
<td>10.00</td>
<td>36.00</td>
<td>.690</td>
</tr>
<tr>
<td>BDI.Communication</td>
<td>Taiwan</td>
<td>9.11</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>United States</td>
<td>9.89</td>
<td>37.00</td>
<td>.757</td>
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<tr>
<td>BDI.Motor</td>
<td>Taiwan</td>
<td>10.72</td>
<td></td>
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<tr>
<td></td>
<td>United States</td>
<td>8.28</td>
<td>29.50</td>
<td>.330</td>
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<tr>
<td>BDI.Cognitive</td>
<td>Taiwan</td>
<td>9.83</td>
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<td></td>
<td>United States</td>
<td>9.17</td>
<td>37.50</td>
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Table C10

*Means and Deviations of PCRI (Taiwan verse U.S. in match sample)*

<table>
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<tr>
<th></th>
<th>Country</th>
<th>Mean</th>
<th>SD</th>
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<tr>
<td>Total Score of PCRI</td>
<td>Taiwan</td>
<td>211.00</td>
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<tr>
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<td>United States</td>
<td>234.56</td>
<td>10.85</td>
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<td>Support</td>
<td>Taiwan</td>
<td>21.33</td>
<td>4.00</td>
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<tr>
<td></td>
<td>United States</td>
<td>23.22</td>
<td>3.42</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>Taiwan</td>
<td>28.78</td>
<td>3.56</td>
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<tr>
<td></td>
<td>United States</td>
<td>36.44</td>
<td>2.07</td>
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<tr>
<td>Involvement</td>
<td>Taiwan</td>
<td>40.56</td>
<td>4.75</td>
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<td>United States</td>
<td>48.44</td>
<td>2.70</td>
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<td>Taiwan</td>
<td>25.56</td>
<td>1.59</td>
</tr>
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<td>United States</td>
<td>25.89</td>
<td>2.85</td>
</tr>
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<td>Limit Setting</td>
<td>Taiwan</td>
<td>29.89</td>
<td>4.49</td>
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<td>United States</td>
<td>30.11</td>
<td>4.81</td>
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<td>Taiwan</td>
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<td>2.40</td>
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<td>27.44</td>
<td>2.07</td>
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<td>Taiwan</td>
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<td>United States</td>
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Table C11

*Pass Rates for BDI-II by Support Variables*

<table>
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<tr>
<th>Variable</th>
<th>Pass%</th>
<th>Level</th>
<th>SD-1</th>
<th>$X^2$</th>
<th>SD-15</th>
<th>$X^2$</th>
<th>SD-2</th>
<th>$X^2$</th>
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<tr>
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<td>Received</td>
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<td>23%</td>
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<td>37%</td>
<td>0.41</td>
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<td></td>
<td>29%</td>
<td>0.29</td>
<td>39%</td>
<td></td>
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<td>Educational Group</td>
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<td></td>
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<tr>
<td>Received</td>
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<td>30%</td>
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<td></td>
<td>24%</td>
<td>0.34</td>
<td>42%</td>
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</tr>
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<td>0%</td>
<td>2.40</td>
<td>17%</td>
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<td>30%</td>
<td>0.19</td>
<td>40%</td>
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<td></td>
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<td>0.25</td>
<td>29%</td>
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<td>28%</td>
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<td>or School</td>
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<tr>
<td>Received</td>
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<td>2.18</td>
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<td>22%</td>
<td>3.98</td>
<td>34%</td>
<td>2.53</td>
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<td>33%</td>
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<td>0.33</td>
<td>37%</td>
<td></td>
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</table>

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table C12

*Summary of Logistic Regression Predicting Pass Rate of BDI-II from Stress Score*

<table>
<thead>
<tr>
<th>Prediction</th>
<th>$X^2$</th>
<th>df</th>
<th>$p$</th>
<th>B</th>
<th>SE</th>
<th>$e^B$</th>
<th>$P$</th>
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<tbody>
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<td>BDI.SD-1</td>
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<td>.297</td>
<td>-.048</td>
<td>.046</td>
<td>.953</td>
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<td>.170</td>
<td>-.056</td>
<td>.041</td>
<td>.946</td>
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<td>BDI.SD-2</td>
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<td>-.067</td>
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Table C13

*Analysis of Differences in PCRI by Number of Children*

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<th>df</th>
<th>MS</th>
<th>F</th>
<th>$P$</th>
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<td>Number of children</td>
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<td>343.89</td>
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<td>198.97</td>
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<td>Total</td>
<td>14416.65</td>
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* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
### Table C14

*Analysis of Differences in PCRI by Support Variables*

<table>
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<th>df</th>
<th>MS</th>
<th>F</th>
<th>P</th>
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<td>Child's gender</td>
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<td>Total</td>
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<td>70</td>
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### Table C15

*Analysis of Differences in Stress between Countries*

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<th>Country</th>
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<th>Mann-Whitney</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taiwan</td>
<td>42</td>
<td>37</td>
<td>.756</td>
</tr>
<tr>
<td>United States</td>
<td>43.33</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX D

OTHER ADDITIONAL MATERIALS
December 17, 2010

Dr. George Morrison
Department of Teacher Education and Administration
University of North Texas

Institutional Review Board for the Protection of Human Subjects in Research (IRB)
RE: Human Subject Application #10-424

Dear Dr. Morrison:

The UNT IRB has received your request to modify your study titled “Autistic Children in U.S and Taiwan: A Comparison of Diagnoses Criteria and Parenting Stress.” As required by federal law and regulations governing the use of human subjects in research projects, the UNT IRB has examined the request to modify the title of your study to “Autistic Children in U.S and Taiwan: A Comparison of Diagnoses Criteria and Parent-Child Relationship” as well as modify the Informed Consent Form. The modification to this study is hereby approved for use with human subjects.

Please contact Jordan Harmon, Research Compliance Analyst, at (940) 565-3940, or Boyd Herndon, Director of Research Compliance, at (940) 565-3941, if you wish to make changes or need additional information.

Sincerely,

Patricia L. Kaminski, Ph.D.
Associate Professor
Chair
Institutional Review Board

PK/ jh
University of North Texas Institutional Review Board

Informed Consent Form

Before agreeing to participate in this research study, it is important that you read and understand the following explanation of the purpose, benefits and risks of the study and how it will be conducted.

Title of Study: Autistic Children in U.S. and Taiwan: A comparison of diagnoses criteria and parent-child relationship

Principal Investigator: George S. Morrison, University of North Texas (UNT) Department of Teacher Education and Administration

Purpose of the Study: You are being asked to participate in a research study which compares the diagnoses of autism based on cultural differences and to provide detailed information about children with autism and parent-child relationship.

Study Procedures: You will be asked to complete the first survey for children development inventory in adaptive, personal-social, communication, motor, and cognitive domains. It will take you 30-40 minutes to fill the first survey. You will spend additional 20 minutes for the second survey which is used to evaluate parent-child relationship.

Foreseeable Risks: None.

Benefits to the Subjects or Others: This study is not expected to be of any direct benefit to you, but to the field of early childhood special education and early childhood education. The study will provide detailed information, which investigates the relationship between autism and parent-child relationship. Teachers, social works and any other professionals who are working with autistic children will understand the needs of families who have children with autism and provide appropriate supports. Validating the development delays and parent-child relationship instruments developed in the United States will provide a reliable optional instrument in the researches of autistic children and their families in Taiwan.

Procedures for Maintaining Confidentiality of Research Records: All information obtained in this study is strictly confidential. You will be identified by a study code number only. In written reports and oral presentations of the study, there will be no information that would identify you as participant.

Confidentiality will be protected to the full extent that is allowed by law. The signed consent forms and completed surveys will be locked in a cabinet in the faculty office of the principal investigator. Paper copies and computer files with identifiable information will be destroyed within three years after completion of the study.
Questions about the Study: If you have any questions about the study, you may contact Dr. George S. Morrison at telephone number (940) 565-4476.

Review for the Protection of Participants: This research study has been reviewed and approved by the UNT Institutional Review Board (IRB). The UNT IRB can be contacted at (940) 565-3940 with any questions regarding the rights of research subjects.

Research Participants’ Rights:

Your signature below indicates that you have read or have had read to you all of the above and that you confirm all of the following:

- Dr. George S. Morrison has explained the study to you and answered all of your questions. You have been told the possible benefits and the potential risks and/or discomforts of the study.
- You understand that you do not have to take part in this study, and your refusal to participate or your decision to withdraw will involve no penalty or loss of rights or benefits. The study personnel may choose to stop your participation at any time.
- You understand why the study is being conducted and how it will be performed.
- You understand your rights as a research participant and you voluntarily consent to participate in this study.
- You have been told you will receive a copy of this form.

____________________________
Printed Name of Participant

____________________________  _____________
Signature of Participant        Date

For the Principal Investigator or Designee:

I certify that I have reviewed the contents of this form with the subject signing above. I have explained the possible benefits and the potential risks and/or discomforts of the study. It is my opinion that the participant understood the explanation.

____________________________  _____________
Signature of Principal Investigator or Designee        Date

Office of Research Services
University of North Texas
Last Updated: August 9, 2007
北德州大學研究審查委員會

研究同意書

在同意參與研究前，調查研究人員必須向您告知本項研究的目的、本項研究可能帶來的利益及研究程序。

研究名稱： 台灣與美國自閉症診斷標準及親子關係之比較研究

主要研究者： George Morrison, 美國北德州大學師資教育及教育管理學系教授

研究目的： 本研究主要在根據文化差異比較自閉症兒童診斷標準，同時探討自閉症兒童與父母的依附關係及其父母的教養壓力

研究過程： 本研究涵蓋兩份問卷。第一份問卷費時30-40分鐘，主在評量孩子的發展，包含適應能力、個人社交能力、溝通能力、動作發展、認知概念等項目。第二份問卷費時20分鐘，主要在了解您與孩子的親子關係。

可能風險： 無

研究利益： 本研究對您而言雖然無直接利益，研究結果卻可以提升幼兒教育及特殊教育品質。本研究將針對自閉症兒童與其父母提供一系列探討。教師、社會工作者及其他教育研究者可以藉此了解自閉症兒童及其家庭的需求，並提供適當的協助。本研究中所翻譯的問卷普遍用於美國教育研究，透過本研究可以提供台灣自閉症孩童與家庭另一項可靠的評
量工具選擇。

資料保密流程：本研究保證對參與者之個人隱私加以保護，個人資料並不會在論文中引用，同時亦保證參與者個人資料與問卷資料將只作為學術研究用途，不作他用。研究同意書與問卷將依據美國教育研究之規定鎖於主要研究者的檔案櫃中。所有書面資料與電腦檔案將於研究結束三年後銷毀。

其它事項：如果您對於本研究還有任何疑問，歡迎隨時連絡主要研究者 George Morrison 教授。電子信箱: george.morrison@unt.edu

研究檢查：本研究是經過美國北德州大學研究審查委員會同意。如果您對於參與者的權利有任何問題，歡迎連絡北德州大學研究審查委員會，連絡電話為 1-940-565-3940

在本文件上簽名表示自願同意參加，同時已了解以下細節:

·主要研究者 George Morrison 教授已經解釋清楚本研究細節，您已被告知研究利益及可能風險。
·您參加這項研究屬於自願性(您自己的選擇)，您有權利在過程中臨時退出本研究。
·您了解本研究的研究過程。
·您了解您的權利及您是自願同意參與本研究。
·您將會收到本研究同意書的複本。
參與者姓名(以正楷書寫)

參與者簽名  日期

以下為主要研究者簽名及保證事項：

我保證我已瀏覽過本研究同意書內容並向研究參與者解釋研究利益與可能風險。研究參與者已了解以上事項。

主要研究者簽名  日期

APPROVED BY THE UNT IRB
DATE: 12-17-10
COMPREHENSIVE REFERENCES


Mahoney, G., & MacDonald, J. D. (2007). *Autism and developmental delays in young children.* Austin, TX: PRO-ED.


