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Well-Being and Support Systems of Taiwanese Mothers of Young Children with Developmental Disabilities

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Well-Being and Support Systems of Taiwanese Mothers of Young Children with Developmental Disabilities

A Dissertation submitted in partial satisfaction
of the requirements for the degree of

Doctor of Philosophy

in

Education

by

Tzu-Hua Ho

June 2013

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ABSTRACT OF THE DISSERTATION

Well-Being and Support Systems of Taiwanese Mothers of Young Children with Developmental Disabilities

by

Tzu-Hua Ho

Doctor of Philosophy, Graduate Program in Education
University of California, Riverside, June 2013
Professor Sharon Duffy, Co-Chairperson
Professor Jan Blacher, Co-Chairperson

This study investigated the influences of children's adaptive skills, problem behaviors, and parent support systems (informal support and formal professional support) on maternal well-being (health and stress) in Taiwanese mothers of young children with developmental disabilities. The study examined the moderating effects of formal support and informal support on the relationship between child characteristics and maternal well-being. The theoretical framework of this study is based on the Double ABCX model of Family Adjustments and Adaptation Response (FAAR) (McCubbin & Patterson, 1982, 1983). An ABX model based on the Double ABCX model was used in this study for investigating the relationships among child characteristics, support systems, and maternal well-being in Taiwan. One hundred and twenty mothers of young children with

developmental disabilities between 3 and 5 years of age participated in this study. Children's adaptive skills and problem behaviors were measured using the Vineland Adaptive Behavior Scales and the Child Behavior Checklist. The Family Support Scale was used to collect information about mothers' perceived helpfulness of two types of support. The Parenting Stress Index was used to measure mothers' stress. The 36- item Short Form Health Survey was chosen to assess maternal health. Regressions and general linear models (GLM) were tested to examine the moderating effects of supports on the associations between child characteristics and maternal well-being. Consistent with the literature in U.S. and other countries, the child-related parenting stress was significantly associated with child problem behavior. Results suggest that the perceived informal support is a significant moderator for the impact of child problem behavior on parenting stress. Mothers of children with more severe problem behaviors reported lower stress when they perceived better informal support. Different effects of formal and informal supports were discussed. It is important to consider both child characteristics and mothers' concerns for providing effective early intervention services and appropriate supports to families of children with developmental disabilities.

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CHAPTER 1

Introduction and Literature Review

The aim of this study was to investigate the influences of child characteristics (adaptive skills and problem behaviors) and family support on the well-being of Taiwanese mothers with young children with developmental disabilities or developmental delays. It focused on the moderating effects of general social/emotional support and professional/parenting support on the relationships between child characteristics and maternal well-being.

Importance of Family and Parent on Early Intervention

In the literature on developmental disabilities and early intervention focused mainly on the U.S. and other countries, it is recognized that family plays a key role and has important influences on children's development and other outcomes. It has been suggested that children with disabilities can be served best in the context of their family and community life as well as the formal early childhood programs with development-enhancing learning opportunities (Blue-Banning, Summers, Frankland, Nelson, & Beegle, 2004; Dunst, Hamby, Trivette, Raab, & Bruder, 2000). It is generally agreed that educators and health care professionals who deliver early intervention services and develop Individualized Family Service Plans (IFSP) should work not only with children but also with their parents as a collaborative partnership to improve the children's development and support families to successfully engage with life in school and community. In a recent meta-analytic study, family-systems intervention practices were found to have direct effects on parent well-being and self-efficacy beliefs and

indirect effects on parent-child interactions and child development. These indirect effects of family system interventions on child development were mediated by self-efficacy beliefs and parent well-being (Trivette, Dunst, & Hamby, 2010). These finding suggest that service providers need to understand the specific needs and concerns perceived by parents of children with disabilities for developing appropriate family-centered early intervention programs. In the present study, maternal well-being was the outcome variable and investigated influences of child characteristics and supports on maternal well-being.

Influences of Children's Characteristics on Maternal Well-being

One focus of this study was the influence of children's adaptive skills and behavior problems on their mothers' physical and psychological well-being. To understand families and parents of children with disabilities, many researchers study the impact of children with disabilities on their families and the relationships between family functioning, socio-economic resources, parental well-being and the early academic or socio-emotional competence of preschool children. Researchers have explored family and neighborhood predictors of children's early competence (Barbarin, Bryant, McCandies, Burchinal, Early, Clifford, Pianta, & Howes, 2006; Mann, McCartney, & Park, 2007). Other studies examined how parental well-being or life satisfaction can be influenced by the need to care for children with special needs or disabilities (Baker, Blacher, & Olsson, 2005; Eisenhower, Baker, & Blacher, 2005). Eisenhower et al. (2005) suggested that phenotypic expressions of behavior problems are manifested as early as age 3. They found that mothers of preschool children with autism reported high levels of behavior

problems and were found to be at elevated risk of high stress. Baker and colleagues (2005) followed 214 families with 3-year-old children with and without developmental delays for 2 years. The study results suggested that parents of delayed and non-delayed preschoolers generally did not differ on depression or marital adjustment. However, child behavior problems were strongly related to both parental depression and poor marital adjustment which suggests that some specific child characteristics, such as behavior problems, may be more important to parent outcomes than a lack of adaptive skills or the presence of a disability. The relationship between Taiwanese children's adaptive skills and problem behaviors and maternal well-being was one important part in the present study.

This study focused on young children age 3 to 5 and their mothers. Parents and their children with developmental disabilities at these young ages are usually the service targets of early intervention. At this stage, mothers are most often the primary caregivers who notice the developmental or behavioral problems of their children and encounter difficulties while interacting with them. Thus, providing needed professional intervention or social/emotional supports as early as possible to these families is important for improving family dynamics and the parental impact on their children's development. Researchers have concluded that to early identify children who are at risk and serve families with special needs may help to decrease the overrepresentation of minority children in special education and reduce the length of time that special educational services are needed (Barbarin et al., 2006; Mann et al., 2007). Baker et al. (2005) also concluded that interventions for parents and children should be available in preschool

ages, not only to enhance parenting skills and behavior management strategies but also to improve parents' belief systems and optimism. Given the importance of intervention at this age, the present study focused on the influence of supports for mothers with children at age 3 to 5.

The Theoretical Framework of This Study

In addition to the potential influences of children's adaptive skills and behavior problems on their mothers' well-being, the present study considered mothers' perceptions of the helpfulness of different support systems. The study also explored how the perceptions of two types of support (informal support from family or social network and formal support through intervention/education) may moderate the impact of child-related stressors on mothers' well-being. The informal support referred to the general social support which represented emotional support or assistance with child care responsibilities from various informal sources, such as family members, friends, and social/community networks. The formal support was the professional services and intervention which includes the advice on problems specific to their children from educators or health care professionals.

In order to study the relationships between child-related stressors, support systems, and mothers' well-being and parenting stress, the present study was based on the double ABCX model of Family Adjustments and Adaptation Response (FAAR) (McCubbin & Patterson, 1982, 1983). This model was developed to explain how family system resources and social support facilitate family members' adaptation to different stress events, including the presence of a child with disability. Theories on families' coping with

stress began with the ABCX family crisis model of Hill's (1949). The original ABCX model postulates that a stressor (A), such as a child with a disability, interacts with the resources and supports (B) for dealing or coping with crisis and with the definition the family makes of the stress event, or coping (C) to produce the crisis (X). The model suggests that the resources/supports (B) and perceptions/coping (C) have moderating effects on the association between the stressor (A) and family stress outcome or indicators of adaptation (X). The original model was refined by McCubbin and Patterson (1982) by treating coping (C) as the central process in the family's efforts to adapt to a crisis and adding four post-crisis factors, each of which corresponds to a factor in the original model (see Figure 1). The double ABCX model of family adaptation includes components of a family crisis that may be measured in terms of well-being (xX) that results from the family demands associated with the child (aA), family adaptive resources (bB), and family definition of the situation (cC) (see Figure 1.1).

Bristol (1987) applied the model to study the adaptation of mothers of children with autism or communication problems and suggested that family adaptation was positively predicted by the adequacy of social support and active coping patterns. Bristol (1987) also found that resources and beliefs were more predictive of adaptation than severity of the child's handicap.

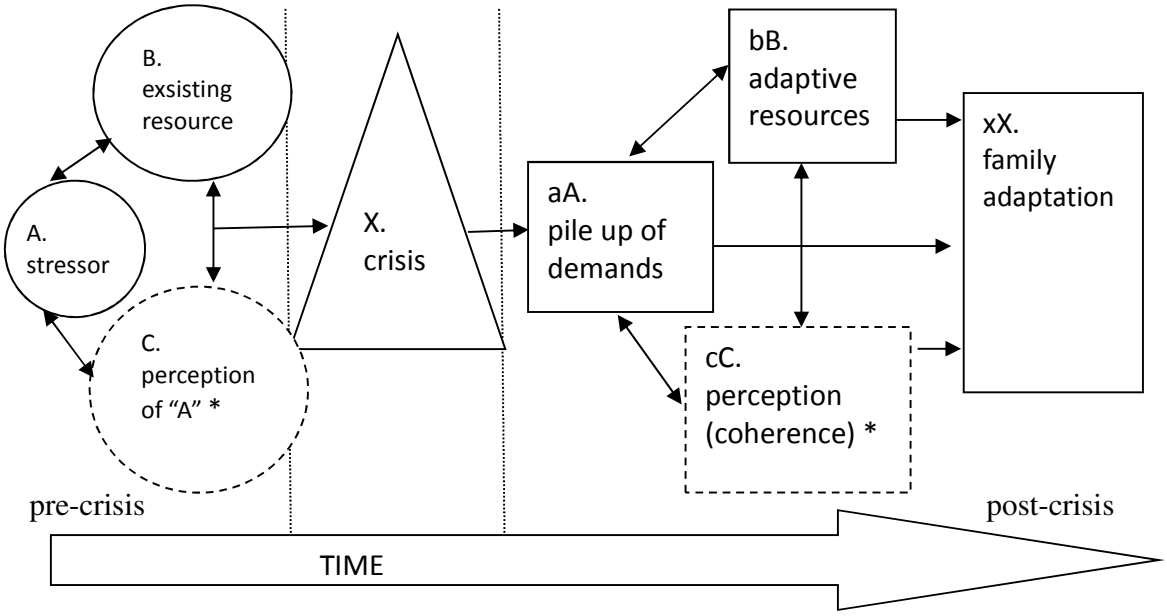

Figure 1. The double ABCX model

* *Note*: Factor C and cC were not included in the model of the present study.

Adapted from "The Double ABCX Model of Family Stress and Adaptation: An Empirical Test by Analysis of Structural Equations with Latent Variables" by Y. Lavee, H. I. McCubbin, & J. M. Patterson, 1985, *Journal of Marriage and The Family, 47*, p.812. Copyright 1985 by the National Council on Family Relations.

The theoretical model for the present study was modified from the double ABCX model of Family Adjustments and Adaptation Response (FAAR) (McCubbin & Patterson, 1982, 1983) by using a simple ABX model with variables of family stressors related to a child with disability (A), supports to the family (B), and the maternal well-being (X). In this study, factor A referred to a set variable of child characteristics, including children's adaptive skills and problem behaviors. Factor B included the informal support

(family/social supports) and formal support (professional supports) provided to families. And, factor X contained mothers' health and parenting stress as indicators of their well-being and adaptation outcomes (see Figure 2). In this exploratory study of Taiwanese families, coping (C) was excluded from the model and the focus was on the possible moderating effects of support (B).

According to Baron and Kenny's (1986) definition, "in general terms, a moderator is a qualitative (e.g., sex, race, class) or quantitative (e.g., level of reward) variable that affects the direction and/or strength of the relation between an independent or predictor variable and a dependent or criterion variable" (p.1174). The present study examined the moderating effects of two types of support on the relationships between child characteristics and two measures of maternal well-being (see Figure 1.2). The effect of factor C (family perception and coping) in the original ABCX models was not examined in this study, but may be studied by the investigator in future. The model tested in this study that examines support systems (B) but not factor C (coping) will be referred to the ABX model.

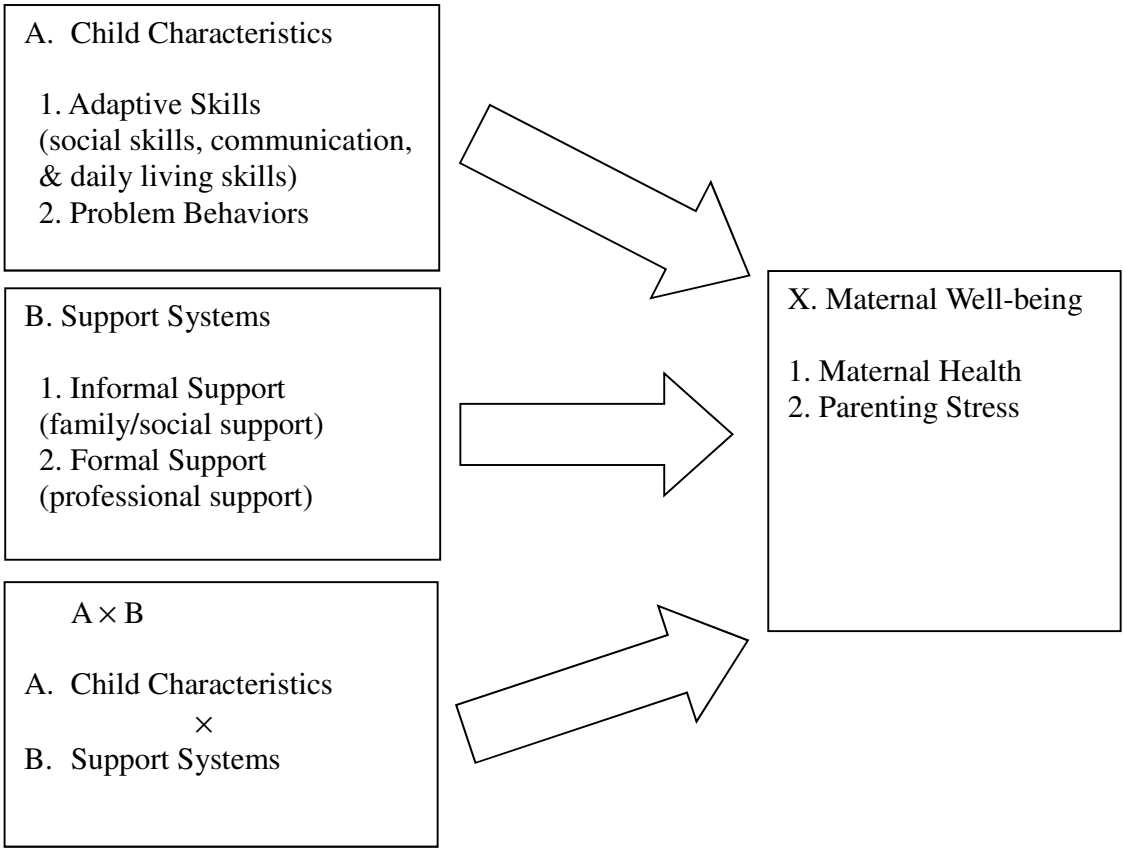

Figure 1.2. Theoretical ABX framework of the study.

Influences of Support Systems on Maternal Well-being

For developing effective services and supports for children and their families, the impacts of support systems on parent well-being have been studied. Informal social support has been found to reduce levels of parent stress (Benson, 2006; Hastings & Johnson, 2001) and the level of family support has been associated with levels of maternal psychological stress (Bromley, Hare, Davison, & Emerson, 2004; Hatzmann, Maurice-Stam, Heymans, & Grootenhuis, 2009). For example, a predictive model of health related quality of life (HRQOL) of parents of chronically ill children was examined by Hatzmann et al. (2009) in the Netherlands. The results showed that the factors explaining parental HRQOL were emotional support, care dependency, days on holiday and being chronically ill as a parent.

Guralnick and colleagues (2008) classified "support" into two categories: parenting support and general support. Parenting support represents the advice on problems specific to their child and assistance with child care responsibilities. General support includes emotional support and validation from various sources (friends or extended families). Guralnick et al. (2008) reported that lack of parenting support during early childhood predicted more dimensions of parent stress (child-related stress or parent-related stress) than general social and emotional support. The results showed that parenting support during the early childhood period predicted lower levels of parent stress assessed during the early elementary years and contributed unique variance. However, general social/emotional support had less widespread effects on parental stress.

Since no consistent results are presented in the literature about which supports are more helpful to the families and parents of children with disabilities and since this study was conducted outside of the United States, the present study investigated the influences of two types of support (informal family/social support and formal professional support) on Taiwanese mothers' well-being.

Studies in Asian and Taiwanese Families

Most studies reviewed thus far have been conducted in Western countries. It is not clear whether these results and relationships will also hold in Asian countries, where family systems and intervention services may operate differently. McConkey, Truesdale-Kennedy, Chang, Jarrah, & Shukri (2008) studied the relationships among coping strategies, supports, and mothers' well-being across three cultures (Irish, Taiwanese, and Jordanian). They found that the impact on maternal well-being was not alleviated by access to professional support or use of coping strategies. McConkey et al. (2008) suggested that health professionals need to understand specific needs of families with different cultural backgrounds and adopt family-centered approaches that have been determined to be effective in supporting parents and their children within their culture. Huang (2006) suggested that eastern and western parents have different viewpoints of their parent responsibility. Many Taiwanese mothers consider their children's future development to be their duty-bound heavy burden. This might be a reason to prevent them from seeking supports and coping strategies outside the family (Huang, 2006), or to respond different kinds of support provided to them.

Similar to the results in western studies, parents of children with developmental disabilities in Taiwan may suffer from more mental health problems. Gau and colleagues (2008) found that parents of children with Down syndrome reported more psychopathological symptoms than parents in a control group. In addition, mothers of children with Down syndrome were less likely to be employed than control mothers. The importance of psychological care and parenting counseling to parents and family members was also stressed (Gau, Chiu, Soong, & Lee, 2008). In a study focusing on parenting stress, Chung (2008) reported that mothers of preschool children with autism reported higher parenting stress than the control group in that study. And, Chung (2008) found "family income" is a factor which can influence the level of parenting stress perceived by mothers of children with autism.

In Taiwan, different results regarding parents' demands of professional or social/emotional supports have been presented in the literature. It was suggested that "family location" and "family income" had significant influences on family need and resources utilization of families of children with developmental delays (Chang, 2010). When investigating parents in Taipei City (northern Taiwan), Chen (2003) concluded that "information support", such as information about how to access the rehabilitation and education resources, and "professional support", such as early intervention services, provided by special educators and health professionals is more needed than "social/emotional support" and "economic support". In contrast, in another study in the middle of Taiwan, parents reported that "family and social/emotional supports" were more needed than "information support" (Chang, 2010).

Some studies have examined the effectiveness of various supports on parent well-being. Shu and Lung (2005) examined the effect of a 10-week support group on the mental health and quality of life for mothers of children with autism. They provided training in coping strategies and development of social networks in their intervention. Mothers' mental health was not significantly improved in the intervention group, but employment status was related to their mental health. Shu and Lung (2005) suggested that mothers' employment may have created social networks or provided income to support them and mother's education level may be associated with access to resources or information. In another study, Shu and colleagues (2002) examined the effect of a home care program on caregivers of children with intellectual disability. The services provided during home visit included: direct care for children with disability, training for caregivers to solve daily care problems, guidance on how to access community resources and support, and providing services by phone when the need arose. The results showed significant improvement on caregivers' mental health after receiving home care services for nine months and suggested that home care services are valuable for caregivers (Shu, Lung, & Huang, 2002).

The literature has shown that Taiwanese families may have different preferences for support than Western families. Several studies in Taiwan have investigated the health or stress of parents of children with developmental disabilities (Chung, 2008; Gau, Chiu, Soong, & Lee, 2008; Huang, 2006), support needs and resource utilization (Chang, 2010; Chen, 2004), and effects of support on mothers' health (Shu, Lung, & Chang, 2000; Shu & Lung, 2005), but few have addressed "supports" as moderators among the relationships

between child characteristics and maternal well-being in Chinese culture. Also, most studies discussed the needs and utilization of supports to families of children with developmental disabilities instead of the helpfulness of supports as perceived by parents. This study investigated different moderating effects of informal family/social support and formal professional support on the relationships between child characteristics and maternal well-being in Taipei. The results of this study can provide special educators and health care professionals a better understanding of the usefulness of supports perceived by mothers and help to develop a thoughtful family-centered early intervention service.

Research Questions

The independent variables of this study consisted of three of child characteristics that may be associated with maternal well-being (lack of adaptive skill, externalizing problem behavior, and internalizing problem behavior) and two types of supports for mothers (formal support and informal support). The two types of maternal well-being (parenting stress and maternal health) were the two outcomes in this study. The following research questions were provided the framework for the analyses:

1. Are child characteristics (adaptive skill or problem behavior) associated with maternal well-being (parenting stress or maternal health)?
    a. Are children's adaptive skills associated with parenting stress?
    b. Are children's adaptive skills associated with maternal health?
    c. Are children's problem behaviors (externalizing and internalizing) associated with parenting stress?

d. Are children's problem behaviors (externalizing and internalizing) associated with maternal health?

2. Do the support systems (informal and formal supports) moderate the effects of child characteristics (adaptive behavior, internalizing and externalizing problem behaviors) on maternal well-being (parenting stress and maternal health)?

CHAPTER 2

Methods

The research proposal was reviewed and approved by the Human Research Review Board of University of California, Riverside and the Institutional Review Board of Taipei Medical University. Data collection was supervised by the Human Subject Protection Committee of Taipei Medical University in Taipei, Taiwan. The participant selection criteria and procedures, the measurements used in this study, and the data collection procedures are described in the sections below.

Participant Selection

Selection criteria. Mothers of children with developmental disabilities ages 3 to 5 years were selected for this study. The mothers had to live with and be the primary caregiver of the child with developmental disability. They needed to have basic Chinese reading ability or to communicate in Chinese (Mandarin or Taiwanese) to complete the surveys for this study. All children of the mothers in this study were receiving occupational therapy one or twice a week. Depending on their functional performance or the severity of disability, some children also received physiotherapy or speech/language therapy once or twice a week.

Selection procedures. Data were collected between October 1, 2011 and March 23, 2012. Mothers were recruited from the rehabilitation centers of three hospitals in Taipei City and New Taipei City of Taiwan which provide early intervention to children with disabilities. The early intervention services provided were similar in these three rehabilitation centers, including occupational therapy, physiotherapy, and

speech/language therapy. Children's diagnoses and age as recorded on their medical charts were reviewed and screened by the occupational therapist of the child at the early intervention center. These therapists confirmed children met criteria and provided referrals to the investigator. 53 mothers (44.17%) were recruited from the first site, 54 mothers (45%) were from the second site, and 13 mothers (10.83%) were from the third site.

The investigator met with the mother or caregiver that brought the child to the clinic. A small room was provided in the clinical setting for participants and the investigator to meet. The investigator explained the purpose of the study and clarified the issues of confidentiality, informed consent, and data collection procedures. Mothers who were not the primary caregiver or did not live with the child were not asked to participate. 157 mothers were asked, 120 of them agreed to participate.

Participants

Maternal and family demographics. Characteristics of the 120 participants are presented in Table 2.1. Mothers who participated in this study are in the 23~43 age range; their average age is 35.6 years old (*SD* = 4.2). Most of mothers (89.17%) are well-educated and received at least twelve years of education. Most mothers are Taiwanese (*n* = 109), 10 mothers are from China, and one from Southeast Asia. 57 mothers are employed, 63 mothers are stay-at-home mothers. Half of the participants reported having a religion (Buddhism, Daoism, or Christianity), while 50% have no religion. Only five mothers (4.2%) in this study are single parents. 72 mothers (60%) have two children and 28 mothers have only the child that was the focus of the study.

Table 2.1.

Maternal demographics (N = 120)

Variables	*n*	*(%)*
Mother's age		
23~30	16	(13.3)
31~35	43	(35.8)
36~40	46	(38.3)
41~43	15	(12.5)
Level of education		
Less than high school graduate	13	(10.8)
High school graduate	39	(32.5)
Associate degree	32	(26.7)
Bachelor's degree	28	(23.3)
Master's degree	8	(6.7)
Ethnicity		
Taiwanese	109	(90.8)
Chinese	10	(8.3)
Southeast Asian	1	(0.8)

(table continues)

Table 2.1. (continued)

Variables	*n*	*(%)*
Employed		
Yes	57	(47.5)
No	63	(52.5)
Religion		
Buddhism/ Daoism	49	(40.8)
Christianity	11	(9.2)
None	60	(50.0)
Marital status		
Married	115	(95.8)
Divorced	5	(4.2)
Number of children		
1	28	(23.3)
2	72	(60.0)
3	14	(11.7)
4	6	(5.0)

Table 2.2 shows an overview of the household economic situation of this study group. The annual income of most families spanned a wide range from $4,000 to more than $32,000 U. S. dollars. According to the Survey of Family Income and Expenditure in Taiwan (Executive Yuan, R.O.C., 2011), the average annual disposable income for

Taiwanese families was $907,988 new Taiwan dollars (approximately equal to $30,266 U. S. dollars) and the median disposable income was $782,517 (approximately equal to $26,084 U. S. dollars). The average final consumption expenditure in Taiwan was $729,010 new Taiwan dollars in 2011(approximately equal to $24,300 U. S. dollars) (Executive Yuan, R.O.C., 2011). Approximately one-third families in this study presented above average family income in Taiwan. 58.33% families in this study reported that their income and expenditure were balanced.

Table 2.2.

Family demographics (N =120)

Variables	*n*	*(%)*
Annual family income (U.S. dollars)		
less than $4,000	8	(6.7)
$4,000~ $8,000	11	(9.2)
$8,000~ $12,000	16	(13.3)
$12,000~ $16,000	15	(12.5)
$16,000~ $20,000	11	(9.2)
$20,000~ $24,000	9	(7.5)
$24,000~ $28,000	9	(7.5)
$28,000~ $32,000	12	(10.0)
more than $32,000	29	(24.2)

(table continued)

Table 2.2. (continued)

Variables	*n*	*(%)*
Estimated income and expenditure balance		
income < expenditure	26	(21.7)
income = expenditure	70	(58.3)
Income > expenditure	24	(20.0)

Demographics of children. Table 2.3 reports the target children's demographic information. The study included mothers of 88 boys and 32 girls between the age 36 and 71 months (*M* = 54.1, *SD* = 10.3). The most prevalent diagnoses were developmental delay (*n* = 52), autism (*n* = 19), intellectual disability (*n* = 8), and attention deficit hyperactivity disorder (*n* = 8). The remaining children had diagnoses that were reported for five or fewer children.

Table 2.3.

Descriptive statistics of child demographics (N=120)

	n	*(%)*
Age (months)		
36~ 47	38	(31.7)
48~ 59	38	(31.7)
60~ 71	44	(36.7)

(table continue)

Table 2.3. (continued)

	n	*(%)*
Gender		
Male	88	(73.3)
Female	32	(26.7)
Major diagnoses		
Developmental delay	52	
Autism	19	
Attention deficit hyperactivity disorder	8	
Intellectual disability	8	
Attention deficit disorder	6	
Asperger syndrome/ high functioning autism	5	
Speech disorder/ auditory impairment	5	
Cerebral palsy	5	
Epilepsy	4	
Developmental coordination disorder	4	
Sensory integration dysfunction (sensory processing disorder)	2	
Behavior disorder	2	
Hydrocephalus	2	
Chromosomal disorder	1	

Measurements

The Family Data Sheet, the Family Support Scale, the Short Form Health Survey, and the Parenting Stress Index were used to investigate mothers' characteristics, usefulness of supports, maternal health, and parenting stress. The Vineland Adaptive Behavior Scales and the Child Behavior Checklist were selected to examine child's adaptive skills and problem behaviors.

Family Data Sheet. Demographic information and family characteristics were collected on the Family Data Sheet. The ten questions on the Family Data Sheet included parent's education, religion, work status, parent's age, family income, number of children, and the child's age and gender. The form can be finished in about 5 minutes. This information was used to describe the sample.

Vineland Adaptive Behavior Scales. The Taiwanese version of Vineland Adaptive Behavior Scales (VABS, Wu, Chang, Lu, & Chiu, 2004), published in 2004 for children between 3 and 12, was used to evaluate children's adaptive skills. The version used in this study was translated from the classroom edition of the U.S. version of the VABS (Sparrow, Balla, & Cicchetti, 1984). All items from the subscales of socialization (53 items), communication (61 items), and daily living skills (120 items) were summed for the total score used in this study. The items on the Taiwanese version are nearly identical to the U.S. version. Slightly modifications were made to be specific to Chinese culture and lifestyle, such as the use of Chinese language and the skill of using chopsticks.

The raters were asked to rate the child regarding whether or not a given activity was usually or habitually performed by the child. Due to the heavy workload in the clinics,

these measures could not be completed by some therapists and were completed by the caregiver or teacher who was familiar with the child's behavior. If the rater had definite knowledge of the child's performance and sufficient opportunity to observe the child's performance of the activity described by an item, the rater assigned a score in the column labeled "Observed Performance". If the rater had little opportunity to observe the situations in which the child might perform the activity, a score was assigned in the column labeled "Estimated Performance" based on the rater's knowledge of the child's behaviors in other areas. A 3- point scale was used for scoring, with a higher score referring to more skill. The standard score (M = 100/ SD = 15) for each domain can be derived for children in different chronological ages according to the norm of Taiwanese population.

In the U.S. version of the VABS, the alpha coefficients were reported for the Adaptive Behavior Composite to be .96 to .98. The intercorrelations between communication, socialization, and daily living skills were from .58 to .70 (Harrison, 1985). Thus, some overlap between domains was found and the domain standard scores were combined to obtain a composite score. The composite score of communication, socialization, and daily living skills was used to represent adaptive skills in the analyses for this study.

Child Behavior Checklist. The Child Behavior Checklist (CBCL) Taiwanese version Achenbach System of Empirically Based Assessment (Chen, Huang, & Chao, 2009), translated from Achenbach System of Empirically Based Assessment (ASEBA, Achenbach & Rescorla, 2007) for ages 1 ½ to 5, was used to evaluate children's problem

behaviors. It has 99 items and internalizing and externalizing problem subscales. The rater who knows the child well reports how true each item is now or within the past two months by using a 3-point scale, with a higher score referring more problem behaviors. The raw scores were converted to normalized t scores (M = 50/ SD = 10). This study used the scores for total problem behaviors, externalizing problem behaviors, and the internalizing problem behaviors in the analyses. For some analyses, the sample was split into clinical and non-clinical groups based on cut-off scores in the manual.

Family Support Scale. The Family Support Scale (FSS; Dunst, Jenkins, & Trivette, 1984) was translated into Chinese by the investigator and used to collect information about the perceived helpfulness of a variety of possible sources of support, including informal support (family/social support from family, friends, parents, and other non-professionals) and formal support (professional support from school personnel, public or private agencies, and other professionals). Using a 5-point scale (1= not at all helpful to 5= extremely helpful), raters were asked to rate of each 19 possible sources of formal/informal supports, including family members, friends, coworkers, other parents, teachers, non-school professionals, and early intervention services, etc. The FSS manual reports coefficient alpha of the average correlation among the 18 scale items was .79. The split-half reliability was .77 corrected for length using the Spearman-Brown formula (Dunst, Jenkins, & Trivette, 1984). It takes 3 to 5 minutes to finish this scale. The total scale score, and two subscale scores (informal support score and formal support score) can be generated. This study used the informal support score and formal support score in the analyses.

The author of the FSS provided permission to the investigator to translate this scale into Chinese. The translation and back translation steps were followed for developing the version of FSS for Taiwanese in this study.

36- item Short Form Health Survey. The Taiwanese version of the 36-item Short Form Health Survey (SF-36) translated from the U.S. version SF-36 (Ware, Snow, Kosinski, & Gandek, 1993) was used to assess maternal physical and mental health. SF-36 is a 36-item generic health-related quality of life measurement which covers 8 aspects of physical and mental health (physical functioning, role limitation due to physical problems, bodily pain, general health, vitality, social functioning, role limitation due to emotional problems, mental health, and reported health transition) (Ware, Snow, Kosinski, & Gandek, 1993). Mothers were the respondents of the SF-36 in this study. The total score was used in the analyses.

Parenting Stress Index. The Taiwanese version of Parenting Stress Index (PSI) translated by Weng (2003) from the Parenting Stress Index- Third Edition (Abidin, 1995) was selected to measure parental stress. The PSI is composed of two domains: the child domain explores stress related to child temperament and behavior, and the parent domain measures stress related to the tasks and responsibilities associated with the parental role. The PSI includes 94 items. A sample question is “I feel trapped by my responsibilities as a parent”. The internal consistency of the Taiwanese version of PSI is from .492~ .913. The total score was used in this study for analyses.

Data Collection

After obtaining the mother's consent for participation, the mother scheduled a time to complete four surveys. This was done the same day or the next time the mother brought the child to the clinic. The Family Data Sheet, the Family Support Scale, the Short Form Health Survey, and the Parenting Stress Index were distributed and completed by mothers or by the investigator through an interview process if the mother preferred. The average time for completing these surveys by the mother participants was about 45 minutes. The mother was encouraged to finish the surveys at one time if she was available and the treatment time of her child was longer than 45 minutes. Some mothers completed surveys at the next clinic visit or finished them at home and brought them to the next visit. The Vineland Adaptive Behavior Scales and the Child Behavior Checklist were completed by the child's therapist or caregiver or teacher who was familiar with the child's behavior. It took about one hour to finish the two measures.

Statistical Analyses

SPSS 16.0 and SAS 9.3 were used for data analysis in this study. The measurements and their variable names used in analyses and results are listed in Table 2.4.

Descriptive statistics were completed to describe the characteristics of the study sample. Correlations were run to examine bivariate relationships between child characteristics and maternal well-being (main effects). Regressions and general linear modeling (GLM) procedures were used to explore associations between the child characteristics and maternal well-being, and the moderating effects of two types of support on the relationships between child characteristics and maternal well-being. The

independent variables (A) based on the ABX model in Figure 2.1 include children's adaptive skills and problem behaviors (measured by externalizing and internalizing problem behaviors), and the moderators (B) are informal support and formal support. The outcome variables (X) are maternal health and parenting stress. The effects of variables (A) and (B) on two types of maternal outcome variables (maternal health and parenting stress) were examined by separate analyses.

Table 2.4.

Measurements and variable names corresponding to the constructs in the hypothesized ABX model [a].

Variables	Construct name in the model [a]	Measure	Variable names in results
Demographic data		Family Data Sheet (FDS)	n/a
Independent	Child characteristics (A)		
Variables	Adaptive skills	Vineland Adaptive Behavior Scales (VABS)	Adaptive skills
	Problem behaviors	Child Behavior Checklist (CBCL)	Problem behavior
			Externalizing problem behavior
			Internalizing problem behavior
Moderators	Support systems (B)		
	Informal support	The Family Support Scale (FSS)	Informal support
	Formal support	The Family Support Scale (FSS)	Formal support
Outcome	Maternal well-being (C)		
Variables	Maternal health	36- item Short Form Health Survey (SF-36)	Maternal health
	Parenting stress	Parenting Stress Index (PSI)	Parenting stress

[a] See the diagram of ABX model in figure 2.1

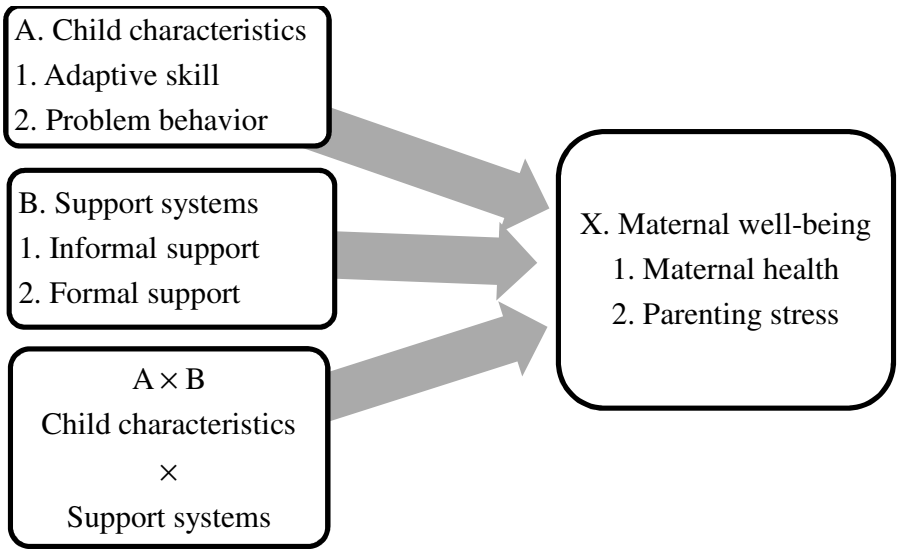

Figure 2.1. Diagram of ABX model.

The first set of research questions in this study (1a~ 1d) asked about the associations between (A) child characteristics (adaptive skill and problems behavior) with (X) maternal well-being (maternal health and parenting stress). To answer these questions, Pearson correlations were initially conducted to determine whether correlations between child characteristics and maternal well-being are significant. For the second set of research questions asking about the moderating effects of the two types of support system (informal support and formal support) on the relationships between child characteristics (adaptive skill and problems behavior) and maternal well-being (maternal health and parenting stress), a series of the general linear modeling (GLM) procedures was conducted. The child characteristic (A) was entered into a regression model first to predict maternal well-being (X). Then, controlling for the child characteristic (A), the significance of a support type (B) was examined. To explore the interaction between child

characteristics and support variables (A × B), the general linear models (GLM) were employed and included (A), (B), and (A × B) in the models. If A × B was significant, this provided evidence that variable B (support) was acting as a moderator. Finally, the general linear models were tested to examine the relationships among child characteristics, support variables, and maternal well-being after controlling the demographics.

To help understand interaction patterns in these models, a median split was used to divide levels of formal and informal support into high and low groups. Based on the Child Behavior Checklist (CBCL) manual, a CBCL score of 60 was used to divide the sample into clinical and non-clinical groups for externalizing and internalizing problem behavior. The sample was divided to four subgroups according the high or low conditions of child characteristics and support scores for each model with significant moderating effect. Means for maternal well-being (parenting stress, maternal health) were then calculated for the subgroups. Line graphs were drawn to compare maternal well-being mean scores of each subgroup.

CHAPTER 3

Results

Correlations among Demographic Variables, Supports, and Maternal Well-being

The relationships between mother's characteristics and the maternal well-being (maternal health and parenting stress) are shown by Pearson correlations on Table 3.1. The results show that maternal health is significantly correlated with mother's education level ($r = .21$, $p < .05$) and family income ($r = .27$, $p < .01$). Mothers with more education and family income perceived better health. In addition, parenting stress is negatively correlated with mother's age ($r = -.19$, $p < .05$), family income ($r = -.64$, $p < .05$), and positively correlated with number of children ($r = .23$, $p < .05$). Mothers who are older and mothers with higher income perceived lower parenting stress. However, mothers with more children reported higher parenting stress. The religion and employment status are not significantly related to maternal well-being.

The informal support is positively correlated with maternal health ($r = .26$, $p < .01$). Mothers who perceived more helpful informal supports reported better health.

Table 3.1.

Correlations among demographics, supports, and maternal well-being

	1	2	3	4	5	6	7	8
1. Mother's age	—							
2. Level of education	.24 **	—						
3. Number of Children	.05	-.11	—					
4. Family Income	.37 **	.55 **	-.03	—				
5. Maternal health	.12	.21 *	-.10	.27 **	—			
6. Parenting stress	-.19 *	-.07	.23 *	-.20 *	-.64 **	—		
7. Formal support	.00	-.01	-.05	.03	.11	-.09	—	
8. Informal support	-.13	.16	.13	.13	.26 **	-.08	.47 **	—

* $p < .05$. ** $p < .01$.

Correlations among Child Characteristics, Supports, and Maternal Well-being

Correlations were computed to examine associations between child characteristics (adaptive skills and problem behaviors) and maternal well-being (maternal health and parenting stress). The correlation matrix is presented in Table 3.2.

Adaptive skills and parenting stress. Children's adaptive skill levels (including communication, daily living, and social skills) were not significantly correlated with parenting stress.

Adaptive skills and maternal health. The result shows that children's adaptive skill levels were not related to maternal health.

Problem behaviors and parenting stress. As shown on Table 3.2, children's problem behaviors were not significantly related to parenting stress. However, total problem behaviors ($r = .22$, $p = .01$) and externalizing problem behaviors ($r = .18$, $p = .04$) were significantly related to the child domain parenting stress. A significant correlation was also found between the internalizing problem behaviors and the child domain parenting stress ($r = .24$, $p < .01$). Mothers of children with more severe problem behaviors reported greater parenting stress.

Problem behaviors and maternal health. The result shows that children's problem behaviors were not significantly related to maternal health.

Supports and child characteristics. Informal support is negatively correlated with children's externalizing problem behaviors ($r = -.24$, $p < .01$). Children in the families with more useful informal supports presented fewer externalizing problem behaviors.

Table 3.2.

Correlations among child characteristics, supports, and maternal well-being

Variables	1	2a	2b	2c	3	4a	4b	4c	5	6
1. Adaptive skills	—									
2. Problem behaviors										
a. Total	-.21*	—								
b. Externalizing	-.22*	.89**	—							
c. Internalizing	-.17	.83**	.59**	—						
3. Maternal health	.00	-.12	-.15	-.12	—					
4. Parenting stress										
a. Total	-.02	.15	.12	.16	-.64**	—				
b. Child domain	-.14	.22*	.18*	.24**	-.50**	.91**	—			
c. Parent domain	-.09	.07	.06	.07	-.67**	.94**	.71**	—		
5. Formal support	-.13	-.03	.04	-.09	.11	-.10	-.07	-.10	—	
6. Informal support	-04	-.20*	-.24**	-.14	.26**	-.08	-.02	-.12	.47**	—

* $p < .05$. ** $p < .01$.

Moderating Effects of Support Systems

To examine the research questions, general linear modeling (GLM) analyses were conducted to examine the moderating effects of formal support and informal support on relationships between child characteristics and maternal well-being (Table 3.3). A significant interaction term indicates that formal or informal support has a moderating effect on the maternal well-being score.

Since there is no relationship between adaptive skills and the two outcome variables (parenting stress and maternal health), the GLM models consisting of adaptive skills, formal or informal support, and parenting stress or maternal health were not examined in this study. A series of GLM models (see Table 3.3) examine the relationships among child problem behaviors, supports, and maternal well-being was conducted. Additionally, GLM models including the demographic variables (family income, number of children, mom's age, and level of education) were conducted to examine the moderating effects of formal/informal support on the relationships between child problem behaviors and maternal well-being.

Table 3.3.

The list of general linear models

Model	Independent variable	Moderator	Outcome variable
1	Externalizing problem behavior	Formal support	Parenting stress
2	Externalizing problem behavior	Informal support	Parenting stress
3	Internalizing problem behavior	Formal support	Parenting stress
4	Internalizing problem behavior	Informal support	Parenting stress
5	Externalizing problem behavior	Formal support	Maternal health
6	Externalizing problem behavior	Informal support	Maternal health
7	Internalizing problem behavior	Formal support	Maternal health
8	Internalizing problem behavior	Informal support	Maternal health
9	Demographics and total problem behavior	Formal support	Parenting stress
10	Demographics and total problem behavior	Informal support	Parenting stress
11	Demographics and total problem behavior	Formal support	Maternal health
12	Demographics and total problem behavior	Informal support	Maternal health

Model 1: Does formal support moderate the effect of children's externalizing problem behavior on parenting stress? For examining the moderating effect of formal support on the relationship between children's externalizing problem behavior and parenting stress, the general linear model 1 was tested. The result shows that the interaction term (externalizing problem behavior × formal support) was not significant. Thus, formal support did not moderate the effect of children's externalizing problem behavior on parenting stress.

Model 2: Does informal support moderate the effect of children's externalizing problem behavior on parenting stress? To examine the moderating effect of informal support on the relationship between children's externalizing problem behavior and parenting stress, the general linear model 2 was conducted (see Table 3.4). The interaction term (externalizing problem behavior × informal support) was found to be significant, F (1,119) = 4.77, p = .03. Thus, the informal support moderated the effect of children's externalizing problem behavior on parenting stress. When children presented higher externalizing problem behaviors, the more useful informal supports perceived by mothers can help to lower their parenting stress.

Table 3.4.

General linear model 2: Externalizing problem behavior, informal support, and parenting stress

Outcome variable: Parenting stress (Mean = 271.93)					
Source	*Df*	*Type I SS*	*F*	*P*	*Mean*
Externalizing problem behavior	1	4835.24	1.81	.18	58.57
Informal support	1	846.10	0.35	.56	23.98
Interaction term: externalizing problem behavior × informal support	1	11578.74	4.77	.03*	
Total	119		2.31	.08	
R^2 = .06					

* $p < .05$.

Interaction pattern in Model 2: Externalizing problem behavior — informal support — parenting stress. The interaction pattern is shown on Figure 3.1. In the comparison of mean parenting stress scores for mothers of children with clinical level of externalizing problem behaviors, mothers who perceived higher levels of informal support showed lower levels of parenting stress (M = 251.5) than those who perceived lower levels of informal support (M = 281.2, t = 2.22, $p < .05$). Informal support does not have an impact on mothers of children with relatively fewer externalizing problem behaviors. Thus, the

perceived informal support is associated with lower levels of parenting stress for mothers of children with clinical levels of externalizing problem behaviors.

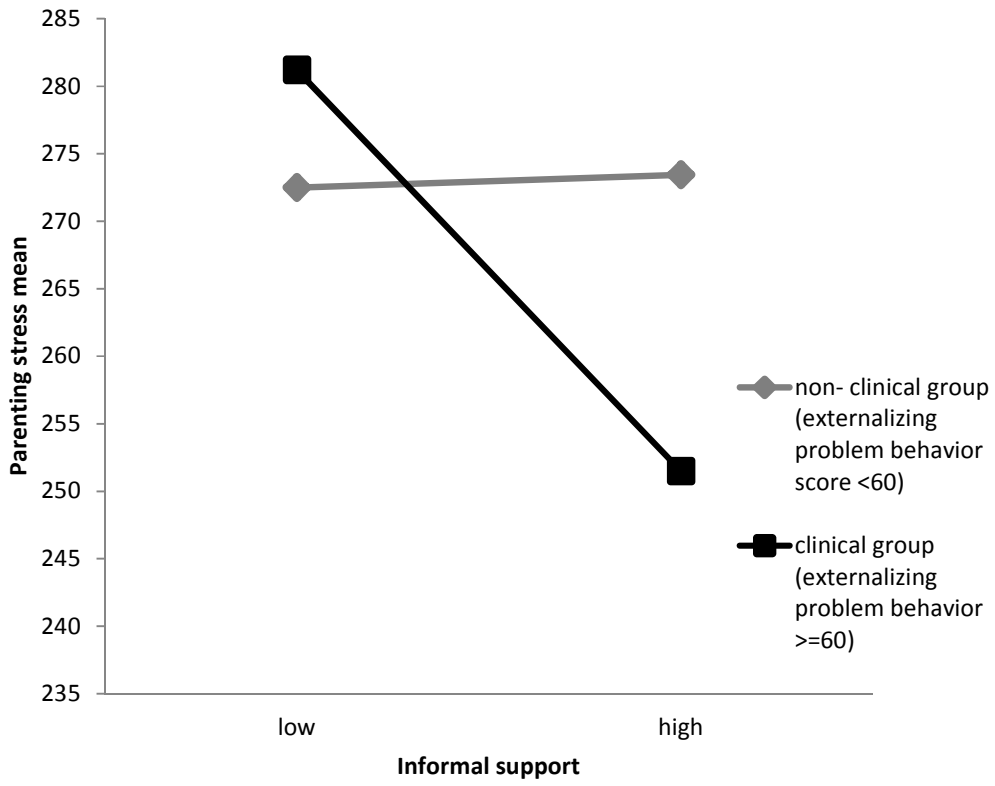

Fig 3.1. *Interaction pattern of externalizing problem behavior × informal support in Model 2: Externalizing problem behavior — informal support — parenting stress.*

Model 3: Does formal support moderate the effect of children's internalizing problem behavior on parenting stress? To examine the moderating effect of formal support on the relationship between children's internalizing problem behavior and parenting stress, the general linear model 3 was conducted (see Table 3.5). The interaction term (internalizing problem behavior × formal support) approached significance, F (1,119) = 3.56, p =.06. The main effect of internalizing problem behavior

also approached significance, F (1,119) = 3.72, p =.06, suggesting that formal support showed some moderating effects on the relationship between children's internalizing problem behavior and parenting stress.

Table 3.5.

General linear model 3: Internalizing problem behavior, formal support, and parenting stress

Outcome variable: Parenting stress (Mean = 271.93))					
Source	*Df*	*Type I SS*	*F*	*P*	*Mean*
Internalizing problem behavior	1	8934.69	3.72	.06	59.08
Formal support	1	1813.56	0.75	.39	10.72
Interaction term: internalizing problem behavior × formal support	1	8563.13	3.56	.06	
Total	119		2.68	.05	
R^2 = .06					

Interaction pattern in Model 3: Internalizing problem behavior — formal support — parenting stress. The interaction pattern is shown on Figure 3.2. In the comparison of the mean parenting stress scores for mothers of children with clinical level of internalizing problem behaviors, mothers who perceived higher levels of formal support showed lower

levels of parenting stress (M = 265.3) than those who perceived lower levels of formal support (M = 282, t = 1.97, p = .05).

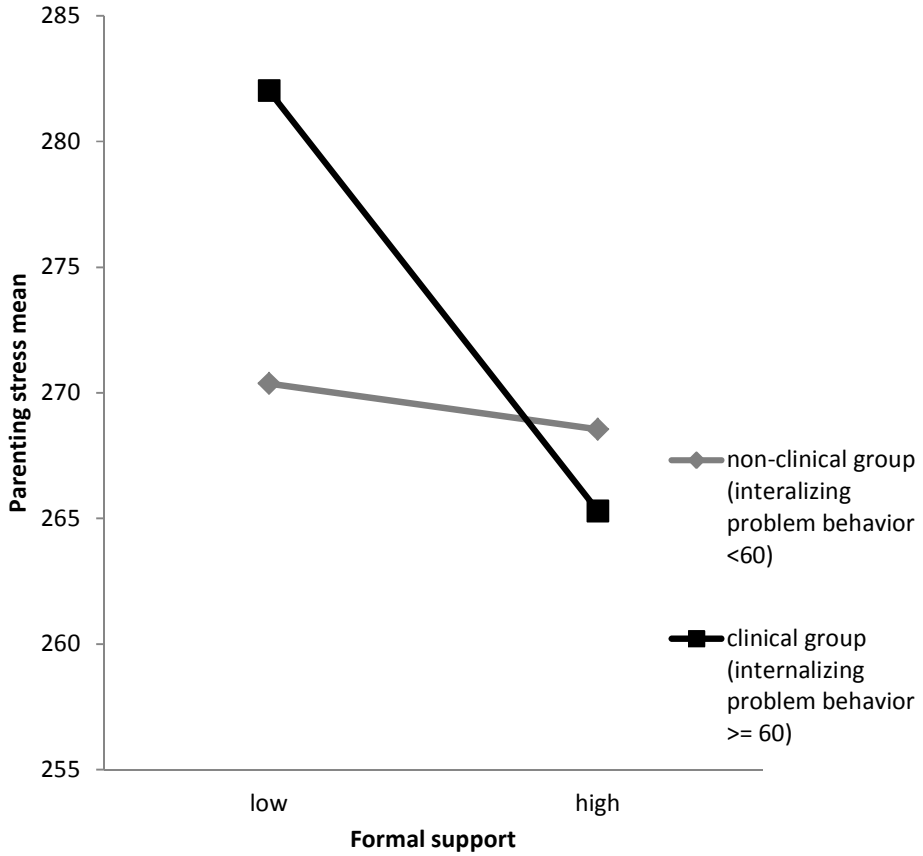

Fig 3.2. *Interaction pattern of internalizing problem behavior ×formal support in Model 3: Internalizing problem behavior－ formal support－ parenting stress.*

Model 4: Does informal support moderate the effect of children's internalizing problem behavior on parenting stress? To examine the moderating effect of informal support on the relationship between children's internalizing problem behavior and parenting stress, the general linear model 4 was tested (see Table 3.7). The significant

interaction between internalizing problem behavior and informal support was found, F (1,119) = 17.97, p <.01, suggesting that informal support moderated the effect of internalizing problem behavior on parenting stress. The main effect of internalizing problem behavior was significant, F (1,119) = 4.15, p = .04. When children presented higher internalizing problem behaviors, those mothers perceived more helpful informal supports reported lower parenting stress.

Table 3.6.

General linear model 4: Internalizing problem behavior, informal support, and parenting stress

Outcome variable: Parenting stress (Mean = 271.93)					
Source	*Df*	*Type I SS*	*F*	*P*	*Mean*
Internalizing problem behavior	1	8934.69	4.15	.04*	59.10
Informal support	1	979.20	0.45	.50	23.98
Interaction term: internalizing problem behavior × informal support	1	38673.21	17.97	.01**	
Total	119		7.52	.01**	
R^2 = .16					

* p < .05. ** p < .01.

Interaction pattern in Model 4: Internalizing problem behavior — informal support — parenting stress. The interaction pattern is shown on Figure 3.3. In the comparison of mean parenting stress scores for mothers of children with clinical level of internalizing problem behaviors, mothers who perceived higher levels of informal support showed lower levels of parenting stress (M = 256.7) than those who perceived lower levels of formal support (M = 288.1, t = 2.42, p < .05). Informal support does not have an impact on mothers of children with relatively fewer internalizing problem behaviors. The perceived informal support is associated with lower levels of parenting stress especially for mothers of children with clinical level of internalizing problem behaviors.

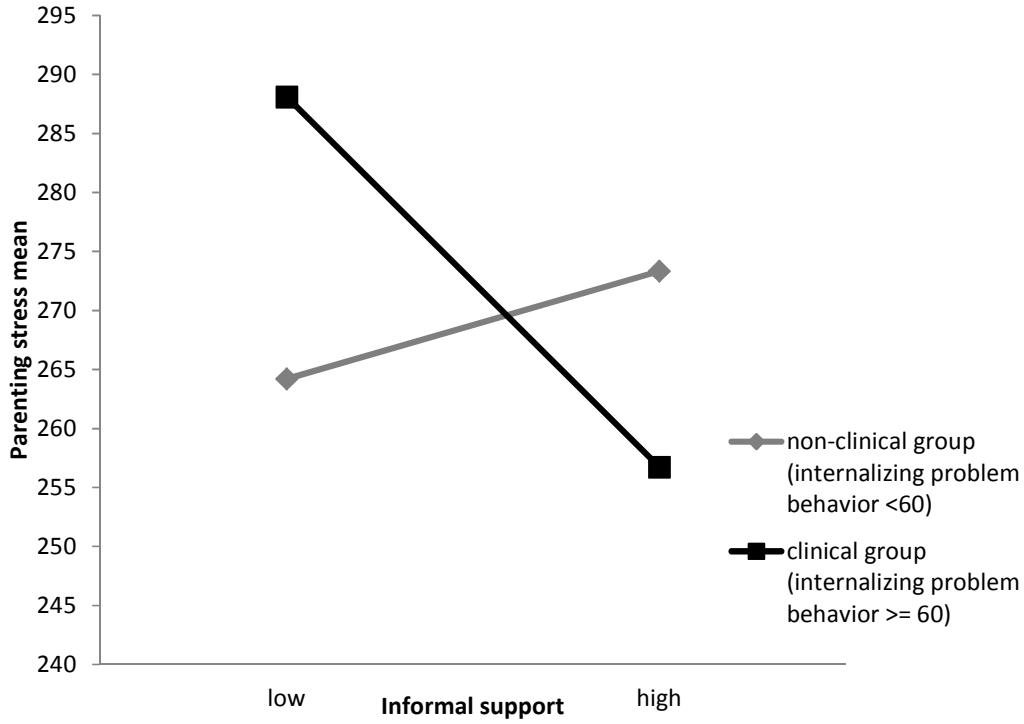

Fig 3.3. *Interaction pattern of internalizing problem behavior ×informal support in Model 4: Internalizing problem behavior —informal support —parenting stress.*

Model 5: Does formal support moderate the effect of children's externalizing problem behavior on maternal health? To examine the moderating effect of formal support on the relationship between children's externalizing problem behavior and maternal health, the general linear model 5 was tested. The interaction term (externalizing problem behavior × formal support) was not significant. The formal support did not moderate the effect of children's adaptive skill on maternal health.

Model 6: Does informal support moderate the effect of children's externalizing problem behavior on maternal health? To examine the moderating effect of informal support on the relationship between children's externalizing problem behavior and maternal health, the general linear model 6 was tested. The interaction term (externalizing problem behavior × informal support) was not significant. The informal support did not moderate the effect of children's adaptive skill on maternal health at significant level.

Model 7: Does formal support moderate the effect of children's internalizing problem behavior on maternal health? To examine the moderating effect of informal support on the relationship between children's externalizing problem behavior and maternal health, the general linear model 7 was conducted. The interaction term (internalizing problem behavior × formal support) was not significant. The informal support did not moderate the effect of children's adaptive skill on maternal health at significant level.

Model 8: Does informal support moderate the effect of children's internalizing problem behavior on maternal health? To examine the moderating effect of informal support on the relationship between children's internalizing problem behavior and

maternal health, the general linear model 8 was tested (see Table 3.7). The interaction term (internalizing problem behavior × informal support) was significant, F (1,119) = 4.50, p =.04. Informal support moderated the effect of internalizing problem behavior on maternal health. When children presented higher internalizing problem behaviors, mothers who perceived more useful informal supports reported better health.

Table 3.7.

General linear model 8: Internalizing problem behavior, informal support, and maternal health

Outcome variable: Maternal health (Mean = 134.89))					
Source	*Df*	*Type I SS*	*F*	*P*	*Mean*
Internalizing problem behavior	1	2920.09	2.31	.13	59.08
Informal support	1	9809.73	7.76	.01**	23.98
Interaction term: internalizing problem behavior × informal support	1	5693.67	4.50	.04*	
Total	119		4.86	.01**	
R^2 = .11					

* $p < .05$. ** $p < .01$.

Interaction pattern in Model 8: Internalizing problem behavior — informal support — maternal health. The interaction pattern is shown on Figure 3.4. In the comparison of the mean maternal health scores for mothers of children with clinical level of internalizing problem behaviors, mothers who perceived higher levels of informal support (M = 147.8) showed better health (t = -2.71, p < .01) than those who perceived lower levels of informal support (M = 122.5). Informal support does not have an impact on health of mothers whose children have relatively fewer internalizing problem behavior. The perceived informal support is associated with better maternal health especially for mothers of children with clinical levels of internalizing problem behaviors.

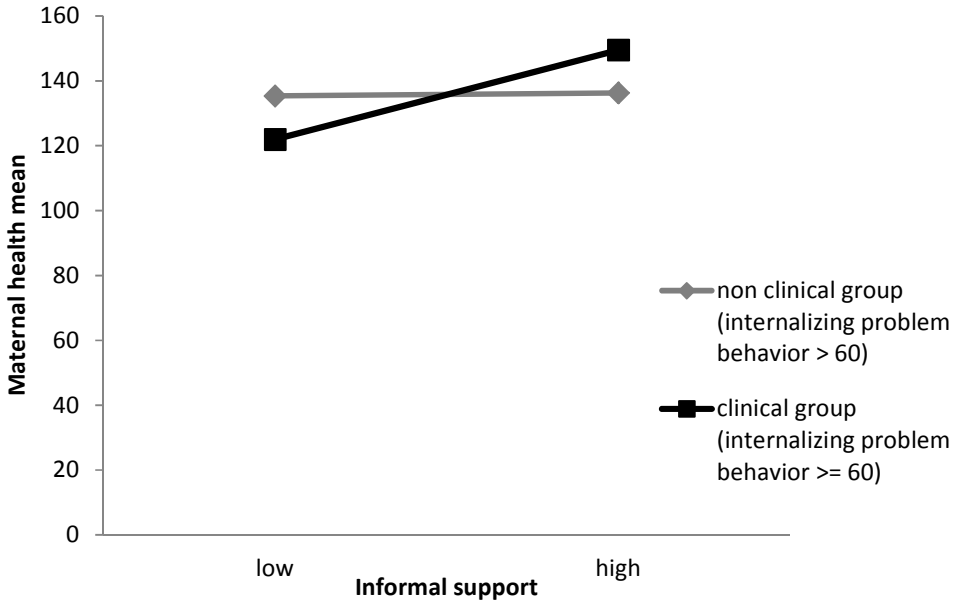

Fig 3.4. *Interaction pattern of internalizing problem behavior × informal support in Model 8: Internalizing problem behavior — informal support — maternal health.*

Model 9~12: Moderating effects of supports after controlling demographic variables. The demographic variables (family income, number of children, mother's age, and level of education) were included in the four general linear models to examine the moderating effect of support variables on the relationship between children's total problem behavior and maternal well-being.

Model 9: Does formal support moderate the effect of children's total problem behavior on parenting stress after controlling demographic variables? To examine the moderating effect of formal support on the relationship between children's total problem behavior and parenting stress, the general linear model 9 was tested. The interaction term (total problem behavior × formal support) was not significant. The formal support did not moderate the impact of children's total problem behavior on parenting stress after controlling demographic variables.

Model 10: *Does informal support moderate the effect of children's total problem behavior on parenting stress after controlling demographic variables?* To examine the moderating effect of informal support on the relationship between children's total problem behavior and parenting stress, the general linear model 10 was tested. Model 10 with the variables of demographics, total problem behavior, informal support, and parenting stress showed the significant interaction term (total problem behavior × informal support), F (1,119) = 9.42, p <.01 (see Table 3.8). Informal support in model 10 moderated the effect of total problem behavior on parenting stress. When children presented higher problem behaviors, mothers who perceived more useful informal supports reported lower parenting stress.

Table 3.8.

General linear model 10: Total problem behavior, informal support, and parenting stress

Outcome variable: Parenting stress (Mean = 271.93)					
Source	*Df*	*Type I SS*	*F*	*P*	*Mean*
Income	1	11429.82	5.48	.02*	5.56
Number of children	1	14604.54	7.00	.01*	1.98
Mother's age	1	5676.49	2.72	.10	35.56
Level of education	1	2175.11	1.04	.31	3.78
Total problem behavior	1	8026.12	3.85	.05	60.67
Informal support	1	3164.05	1.52	.22	23.98
Interaction term: total problem behavior × informal support	1	19637.29	9.42	<.01**	
Total	119		4.43	<.01**	
R^2 = .22					

* $p < .05$. ** $p < .01$.

Interaction pattern in Model 10:Total problem behavior — informal support — parenting stress. The interaction pattern is shown on Figure 3.5. In both clinical and non-clinical groups, mothers who perceived higher informal support reported lower parenting stress after controlling the influences of demographics. The interaction suggests

that the effect of informal support is greater for the group of children with more severe behavior problems even if informal support seems to have a positive effect on both groups.

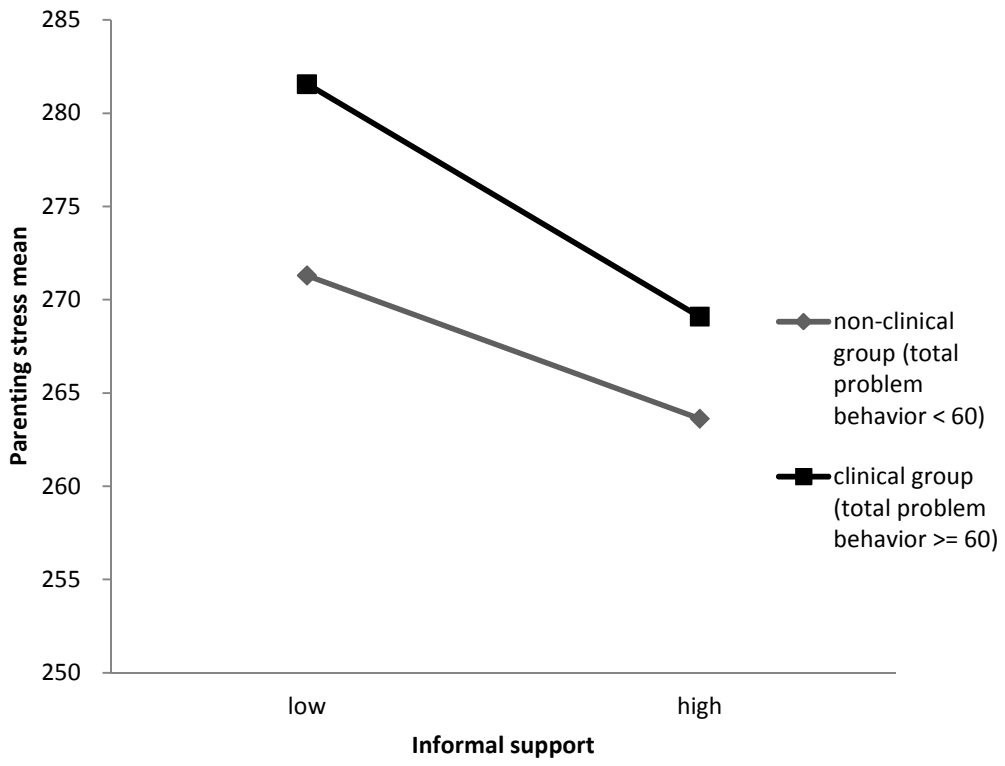

Fig 3.5. *Interaction pattern of total problem behavior × informal support in Model 10: Total problem behavior — informal support — parenting stress.*

Model 11: Does formal support moderate the effect of children's total problem behavior on maternal health? To examine the moderating effect of formal support on the relationship between children's total problem behavior and maternal health, the general linear model 11 was tested. The interaction term (total problem behavior × formal support)

was not significant. The formal support did not moderate the impact of children's total problem behavior on maternal health after controlling demographic variables.

Model 12: Does informal support moderate the effect of children's total problem behavior on maternal health? To examine the moderating effect of informal support on the relationship between children's total problem behavior and maternal health, the general linear model 12 was tested. The interaction term (total problem behavior × informal support) was not significant. The formal support did not moderate the effect of children's total problem behavior on maternal health after controlling demographic variables.

Summary of Results

Consistent patterns were found in the interpretation of the interactions in general linear models 2, model 4, model 8, and model 10:

1. Perceived helpfulness of informal support moderated the relationship between children's problem behaviors (both internalizing and externalizing problem behaviors) on parenting stress when children presented more severe problem behaviors.
2. Perceived informal support moderated the relationship between children's internalizing problem behaviors on maternal health when children presenting severe problem behaviors.

CHAPTER 4

Discussion and Implications

This study examined moderating effects of support systems on the relationships between child characteristics and maternal well-being for mothers of young children with developmental disabilities in Taiwan. Although only four of twelve tested models showed significant moderating effects, the consistency of patterns found in the results provide support for the ABX model and suggest that further study is warranted. The results suggest that the helpfulness of supports as perceived by mothers can moderate the impact of child characteristics on maternal well-being for those whose children present greater parenting challenges. Specifically, higher levels of supports are associated with better maternal well-being for mothers of children who posed the greatest challenges to parenting, i.e. more behavior problems and fewer adaptive skills. For mothers of children with less severe problems, different levels of support did not moderate maternal well-being. The perceived informal supports demonstrated differential effects on maternal health and parenting stress.

Effects of Informal Supports

Greater perceived benefit of informal supports was associated with positive outcomes for mothers of children with clinical levels of problem behaviors (both internalizing and externalizing problem behaviors), i.e., greater perceived support was associated with less parenting stress. With regard to maternal health, higher levels of informal supports were associated with better health for mothers of children with clinical levels of internalizing problem behaviors.

Effects of Formal Supports

The moderating effects of formal support on the association between child problem behavior and parenting stress in the tested models was not significant after controlling some demographic variables, such as family income, number of children, mother's age, and level of education. The results suggest that the Taiwanese mothers maybe benefit from formal supports but the effects were not significant on parenting stress.

Correlations between Child Characteristics and Maternal Well-being

A significant positive relationship between child problem behaviors and child-related parenting stress was found in this study. This finding is consistent with a previous study that examined three different cultures (Irish, Taiwanese, and Jordanian) suggesting that child problem behavior was a major factor for the increased levels of child-related stress and poor mental health experienced by mothers (McConkey et al., 2008). The different relationships of externalizing and internalizing problem behavior on maternal well-being were few discussed. In this study, both externalizing and internalizing problem behaviors were significantly associated with child-related parenting stress. The informal support showed a more significant interaction with internalizing problem behavior than externalizing problem behavior to modify the relationship with parenting stress. Future studies are required to investigate different impacts of child internalizing and externalizing problem behavior for developing effective behavioral management programs.

The non-significant relationship between child adaptive skill and maternal well-being (maternal health and parenting stress) in this study is consistent with the finding in Baker and colleagues' (2005) study of American children, which suggested that children's delay status was not related to parents' depression and marital adjustment, but children's problem behaviors were associated with the two outcomes. In contrast several studies that have found significant relationships between child problem behavior and maternal stress, the relationship between child behavior and maternal health was examined in a study of mothers of children with Asperger syndrome or high-functioning autism in Sweden (Allik, Larsson, & Smedje, 2006). The results showed that child hyperactivity and conduct problems were associated with poor maternal health (Allik et al., 2006), which is not consistent with this study's findings. Eisenhower, Baker, and Blacher (2009, 2013) discussed the relationship between child problem behavior and maternal health from a broader perspective. They followed the impact of early child problem behavior on maternal health at child ages 3, 4, and 5. The results showed that child behavior problem at age 3 and the interaction of child behavior problem and developmental status had long-term impacts on maternal health. When using the maternal stress as a moderator in their analyses, Eisenhower et al. (2009) found that maternal stress interacted with child problem behavior at age 3 to influence maternal health at child age 5. Mothers of children with problem behaviors reported poorer health when they perceived higher stress. Thus, maternal health and parenting stress are both important focuses in early intervention programs. To reduce child problem behaviors in early stage and help mother to relieve stress may improve mothers' adaptation. More research is needed in this

area with different viewpoint or design, and perhaps looking at effects over time, or at children at ages 3, 4, and 5 separately.

Demographics and Maternal Well-being

Some demographic factors were correlated with maternal well-being in this study. For example, less parenting stress was significantly associated with older mothers, fewer children in the family, and higher family income. Better maternal health is significantly related to mother's level of education and family income. Chang (2010) studied the resource utilization of poor families in Taichung, Taiwan, and found that socioeconomic status can affect a family's ability to acquire support. Family characteristics may be important factors for professionals to consider when providing family-centered approaches and effective supports. The present study focused mainly on the effects of support that the family has been able to acquire on maternal well-being, but future studies can include and control more demographic factors in the models investigating relationships among supports, child characteristics, and parent well-being.

Discussions of Moderating Effects of Supports

In this study, high informal supports moderated the effects of parenting stress for mothers whose children had clinical levels of problem behaviors. This result is different from previous research in the Boston area, which suggested that the buffering effect of informal support on stress proliferation was found to be greatest when child symptoms were less severe (Benson, 2006). However, the result is similar to another study in the U.S., which suggested that social support perceived by mothers can modify the association between child externalizing problem behavior and maternal depressive

symptoms. Furthermore, whether or not the child receives care from other caregivers can modify the association between child internalizing problem behavior and maternal depressive symptoms (Lee, Halpern, Hertz-Picciotto, Martin, & Suchindran, 2006).

The moderating effect of formal support in this study was not significant on the association between more severe internalizing problem behavior and less parenting stress. This result is similar with the findings of Benson's study (2006) where formal social support did not significantly reduce parenting stress or depression. However, the effects of formal/professional support on maternal well-being were found to be significant in studies that evaluated the effectiveness of specific types of support programs. For example, a home care program for caregivers of children with intellectual disability in Taiwan showed effects on improving caregivers' mental health after nine months (Shu, Lung, & Huang, 2002). Likewise, in Australia, a 20-week parent education and behavior management intervention (PEBM) and a parent education and counseling intervention for parents of young children with autism both resulted in significant improvement in parental mental health adjustment; the PEBM showed greater alleviation effects on mental health problems than parent education and counseling intervention at 6-month follow-up (Tonge, Brereton, Kiomall, Mackinnon, King, & Rinehart, 2006).

It is a particular interest that findings of this study showed no significant effects of formal/informal supports on maternal well-being when the child showed non-clinical behavior problems or lack of adaptive skills. This may be because the supports that these mothers received were more effective for children with more severe problems or the supports received by mothers of children with less severe problems were already

adequate. Thus, future studies should investigate the characteristics and needs of parents and their children in this age group (age 3 to5) who have less severe problems in order to identify the most appropriate support program for children in this specific group.

Implications

Informal supports in this study showed more moderating effects than formal supports on modifying the associations between child characteristics and maternal well-being. One explanation might be that because these children were young, their mothers were new to formal support systems. These Taiwanese mothers have not yet seen positive effects of formal support or significant changes in their children in a relatively short period of time. Also, mothers' perceptions of the usefulness of supports measured in this study may be different than the actual support benefit. Based on the findings of this study, professionals might need to focus on children's needs in their living context for providing more effective formal supports to these young children and their parents. For example, they may look in the child's home to help design formal supports or deliver formal supports in the homes.

The moderating effects of formal and informal supports found in this study suggested that mothers in Taiwan who seek informal support when their children with severe problems at the age of 3~5 may be more likely to show positive well-being than their counterparts who receive no support or lower levels of support. This finding is consistent with many studies in western cultures suggested that social/emotional support was associated with reduced maternal stress (Benson, 2006; Hastings & Johnson, 2001). McConkey et al. (2008) also reported that maternal well-being was not alleviated by

access to professional support in their study across three cultures. Acquiring formal professional services or seeking support outside the family may bring more, rather than less stress to Asian parents. Guralnick et al. (2008) referred to parenting support as assistance with child care responsibilities and suggested that parenting support from professionals/agencies or families/friends was a stronger predictor of parent stress than general social/emotional support. Bonds between family members sometimes provide important informal support in Asian culture. Many extended Taiwanese families live together or nearby and share the caregiving responsibilities for young children. Some mothers can access help to care for or interact with their children with disabilities through informal support. However, some parents may live in poverty or far away from their extended families, have fewer family resources or with limited informal support. They may need more professional support, learn to access more formal resources, and get help to establish stronger social networks (Chang, 2010). For example, specific training or support programs can be designed for mothers and caregivers according to different family characteristics and support needs. The family-centered professional supports may include the development of parenting skill and coping strategies. Professionals may also assist to develop parents' advocacy groups for sharing experiences and establishing informal support among mothers.

Summary and Future Directions

This study examined the relationship between child characteristics (adaptive skill and problem behavior) and maternal well-being (health and parenting stress). The study also investigated whether and how the helpfulness of supports perceived by mothers

moderated the impact of child characteristics on maternal well-being of mothers with young children with developmental disabilities in Taipei, Taiwan. Understanding these relationships can provide special educators and health care professionals valuable information about Taiwanese mothers' needs and concerns of support. The information could ultimately inform the development of effective intervention programs to support families of children with developmental disabilities and improve parents' well-being. The results of this study also support the ABX model which is based on the Double ABCX model from the U.S., used cross-culturally here to investigate parent adaptation in Taiwan. Such comparisons highlight both differences, and similarities between families from eastern and western cultural backgrounds.

Some issues remain and might be explored and discussed in future studies. For example, the coping strategies and belief systems (factor C in the Double ABCX model) could be included, if adapted to the cultural context of Taiwan. Further, the types, quality, and helpfulness/effectiveness of different supports and coping strategies should be investigated in more detail with parents from different geographic areas or cultural backgrounds. The results of these studies may help us to improve the understanding of family needs and to develop more effective early intervention services appropriate for eastern and western cultures.

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