

**Parenting Practices and the Psychological Adjustment of Children  
in Rural China**

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To  
my father 刘瑞庭 (Liu, Ruiting)  
and  
the memory of my mother 黄淑琼 (Huang, Shuqiong)

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## **Abstract**

In this dissertation, guided by the conceptual framework of the ecological model, I investigated (1) the relationship between parental behaviors and children's psychological well-being in the contexts of family and community; and (2) the intermediate role that parental behaviors play in linking children's and other familial characteristics with children's mental health in a sample of 2000 children in rural northwest China. The hypotheses leading this study are that (1) the effects of parental behaviors on children's psychological adjustment differ depending upon familial and communal characteristics; (2) characteristics of children, families, and communities affect parenting behaviors, which, in turn, are directly linked to children's psychological adjustment. This dissertation is composed of a general introduction, three articles, and a general conclusion. Using multiple regression analysis, I inspected the relationships between parental behaviors and child psychological maladjustment in the first article. In the second article, multilevel regression analysis was used to examine the impacts of community SES and community environment of parenting on child maladjustment and on the parenting-child-development relationships. In the third article, I used structural equation modeling to test the mediating role of parental behaviors in connecting the paths from child characteristics and family variables to child internalizing and externalizing problems. Each article has its own abstract. This study is one of the first studies using a large-scale survey data to investigate the effect of parenting practices on children's psychological adjustment in a poor, rural population. The findings from this study not only contribute additional insight to our view of the variability that characterizes parental behaviors and children's developmental trajectories, but also serve as a guide for integrating

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## General Introduction

The past decades have witnessed a resurgence of interest in identifying the environmental factors that place children at elevated risk for manifesting dysfunctional behaviors such as internalizing problems (e.g., withdrawal, anxiety, and depression) and externalizing problem behaviors (e.g., hyperactivity, aggression, delinquency). Based on the ecological-system model (Bronfenbrenner, 1986), the developmental contexts that may promote or undermine child development consist of a complex system of family, neighborhood, school, social and cultural activities. The connections at all levels among these various contexts, together with their interactions with the developing individual are also part of the developmental environment (Bronfenbrenner & Crouter, 1983; Bronfenbrenner, 1986; Rogoff, 1990; Vygotsky, 1978). Given that family is the principal context in which human development takes place, no one would doubt the key role parenting plays in the system. Building on the existing literature documenting the relationships between parenting and child development, in this thesis, I examine the influences of parental warmth and parental punishment on child internalizing problems and externalizing behaviors in the contexts of family characteristics and community environment. The sample of this study is from rural areas in China

Several aspects make this thesis unique from the existing studies. First, this study is comprehensive in that it takes into consideration the impacts of individual variables (such as child gender, age, and school achievement), family characteristics (such as parental education, family financial status, family size, mothers' mood, and marital relationships), and community environment (such as community socioeconomic status and community atmosphere of parenting) on child psychological adjustment while examining the parenting-

child-development relationship. This analysis is in line with the hypothesis of the ecological model (Bronfenbrenner & Crouter, 1983; Bronfenbrenner, 1986; Rogoff, 1990; Vygotsky, 1978), which advocates that the study of child development should be posited in the developmental contexts of individual, family, community, and social and cultural activities.

Second, this study not only looks at the moderating effect of the contextual variables on the association between parenting and child adjustment, it also tests the mediating role of parenting in bridging the connections from the other individual and environmental characteristics to child psychological development. Given both the interactive relationships among the variables and the hierarchical nature of the contexts, different analytic methods are used in this thesis to simultaneously model the relations among the variables related to the characteristics of children, families, and communities while taking care of the hierarchical system. This helps untangle the mechanisms that relate parenting behaviors and children's adjustment.

Third, the sample of this study is from rural areas in China. Much of what we know about the effects of parenting behaviors on children's problems comes from empirical studies conducted in Western societies<sup>1</sup> or in urban areas. As Geertz (1975) argued, every culture has its own common sense and the members of each culture anchors their everyday lives on their own common sense. Every culture has its own cultural ideologies, from which the parents get the concepts of moral virtue and the parental goals of child-rearing (LeVine, 1998, 1988). Thus, what seems common sense to the members of one culture may seem nonsense to the members of another culture. For example, although parental control has been found to be associated with perceived parental hostility and rejection in White cultural groups (Rohner & Rohner, 1981; Saavedra, 1980), the same parenting practice was reported

to be a sign of parental involvement and concern among African Americans (Baldwin, Baldwin, & Cole, 1990; Cherian & Malehase, 2000), and was related to perceived parental warmth and acceptance in Korea (Rohner & Pettengill, 1985) and among Chinese adolescents (Chao, 1994; Lau & Cheung, 1987). Research also found that the authoritarian parenting style, which is reportedly associated with negative adolescent adjustment among samples consisting of White males, is related to better behavioral outcomes among ethnic minority youth (Magnus, Cowen, Wyman, Fagen, & Work, 1999). Given the variations in the environments of children around the globe, it is essential to study the similar phenomenon in different cultural contexts. The rapid economic growth in China has attracted much attention worldwide. The academic achievement and psychological development of Chinese children have also been an interest of scholars both in China and overseas (e.g. Chao, 1994; Chao & Sue, 1996; Chen, Liu, & Li, 2000; Li & Hao, 1998; Qian & Xiao, 1998). However, much of the study about Chinese children is focused on children in urban, suburban, and relatively developed areas, and is small-scaled. Studies targeting at children in rural areas, especially in inland, relatively poor areas are rare. Given that the majority of Chinese children are still living in rural areas, research on this population will fill this gap. The sample of this thesis provides a unique window through which we will have a better understanding of the variation and generalizability of parenting and its impacts on child developmental trajectories.

Several research questions guide this study.

1. Are children's psychological problems related to parental practices after controlling for child characteristics and other familial characteristics? Do the relationships between parental practices and children's problems vary by individual and/or familial characteristics?
2. Do these relationships differ depending upon community characteristics?

3. Do parental practices play an intermediate role in linking child characteristics and other family characteristics to child problems? Does this mediating role vary depending upon community variables or on child gender?

Corresponding to these questions, the main part of this dissertation is consisted of three articles. Each article is written following American Psychological Association (APA) style.<sup>2</sup> Using multiple regression analysis, I investigated the relationships between parental practices (parental warmth and punishment) and child psychological maladjustment (child internalizing problems and externalizing behaviors) in the first article. The focus is also on whether the relationships are moderated by child variables and by family characteristics. In the second article, I examined the impacts of community socioeconomic status (SES) and community environment of parenting on child maladjustment and on the parenting-child-development relationships. The analytic method used is multilevel regression analysis (also hierarchical linear modeling, HLM). Building on the results from the first article, my focus in the second article is on whether and, if any, how the associations between parenting behaviors and child outcomes vary across communities. In the third article, I used structural equation modeling (SEM) to test the mediating role of parental behaviors in connecting the paths from child characteristics and family variables to child internalizing and externalizing problems. Group comparisons using SEM were conducted to test whether the mediating roles of parenting differ by child gender or by community group categorized by community SES level. Although the main themes of the three articles are the same (the effects of parental practices), each article is independent in contents and has unique contribution to the understanding of these influences.

This dissertation ends with a general conclusion in which I summarized the main findings of this thesis, provided reflections on the findings and on the way I conducted this study, and addressed the implications of this study and future study directions. The purpose of the general conclusion is to connect the three articles and to depict an overall picture of the relationships between parenting and child psychological maladjustment in rural China.

Before I present the main part of my dissertation, I would like to express my deep thanks to the children and their parents in my study. Although the findings from this study may not immediately shed lights on their lives, I hope and believe that my research, together with similar studies around the globe, will attract more attention to this group and ultimately benefit parents and their children in this under-studied population.

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#### Introduction Notes:

<sup>1</sup> See Bornstein (1991) and Bornstein et al. (2001) for research on parenting in different cultures.

<sup>2</sup> With extensive footnotes or appendices to provide detailed information of the study site and to explain the involved methodologies for the purpose of references as a dissertation.

Running Head: Parental Practices & Child Adjustment

**Parental Practices and Child Internalizing and Externalizing Problems in Rural  
China**

### Abstract

Research has shown that parental warmth and punishment predict children's internalizing and externalizing problems. However, few studies have considered how these relationships work in less developed countries, and few have considered potentially confounding characteristics such as child age, gender, and school achievement. In this study, using multiple regression, I analyzed data from 2000 children and their families to examine the contributions of parental warmth and punishment to child internalizing and externalizing problems in rural Northwest China. Given the anticipated discrepancy among different informants in reporting the individual characteristics and behaviors, data from mothers and children were analyzed separately. Parental punishment is positively related to child internalizing problems and externalizing behaviors. Furthermore, the relationship between parental punishment and child externalizing behaviors (reported by children) depends upon child school achievement. The relationships between parental warmth and child adjustment (reported by children) differ depending on child age, gender, sibship size, and school achievement. Based on the data reported by mothers, however, parental warmth has no relationship with child problems. Gender differences are also examined. The results concerning the changing relationships between parenting and child adjustment are discussed in the contexts of existing literature and of Chinese culture.

## **Parental Practices and Child Internalizing and Externalizing Problems in Rural China**

### **Introduction**

In recent years, researchers have devoted increasing attention to the impact of parental practices and attitudes on children's psychological adjustment (e.g., Eisenberg, Fabes, Shepard, Guthrie, Murphy, Reiser, 1999; Emery & Kitzmann, 1995; Juang & Silbereisen, 1999; Shek, 2000). Research has consistently shown that parental harshness, inconsistent discipline, neglect, or hostility are associated with incompetent and deviant behavior, with emotional problems such as depression and anxiety, and with other adjustment problems (Cowen, Work, Wyman, Peter, 1997; Eisenberg, et al., 1999; Liu, 2001, Liu et al. 2002; Qian & Xiao, 1998; Rollins & Thomas, 1979). In contrast, many studies have documented that responsive and warm parenting predicts cooperative and affiliative behavior, emotional adjustment, and social and school competence in children (Booth, Rose-Krasnor, McKinnon, & Rubin, 1994; Chen, Liu, & Li, 2000; Qian & Xiao, 1998). Consistent with these findings, longitudinal analyses also indicate that children's problem behaviors are associated with antecedent harsh parenting (Blanton, Gibbons, Gerrard, Conger, & Smith, 1997; Brody, et al., 2001), low levels of parental monitoring (Walker-Barnes & Mason, 2001), and low maternal nurturance (Brody et al. 2001). The current investigation contributes a new case to the comparative study of parenting practices and children's well-being. The goal of this study was to examine the relationships between parenting behaviors and children's psychological adjustment in *rural* China, where the topic has attracted little empirical attention.

*Cultural Perspective*

Although it has been found that almost *universally*, parental behaviors and attitudes toward the child may have a long-term impact on the child's psychological adjustment (LeVine, 1988; Whiting & Edwards, 1988), parenting and the impacts of parenting on child adaptive or maladaptive functioning may be different in different cultural contexts (Bornstein, 1991). Theories of human development have long stressed its inseparability from human social and cultural activities (e.g., Rogoff, 1990; Vygotsky, 1978; Wertsch, 1989). According to the cultural or contextual perspective (e.g., Harkness & Super, 1995; Kagitcibasi, 1996; LeVine, 1988), socialization goals may vary across cultures because specific qualities and outcomes in children may be valued and emphasized. Given that parental behaviors are influenced by socialization goals, expectations, and values in the culture (Darling & Steinberg, 1993; Harkness & Super, 1995; LeVine, 1988), it is possible that the same parental behavior may be given a different meaning in a different contexts (LeVine, 1988; Greenfield & Suzuki, 1998) and that the mechanisms behind the relations between parenting and the child's adaptive or maladaptive functioning may be different (e.g., Liu, Noam, & Hannum, 2002). For example, research carried out in North America has found that in Caucasian cultural groups, parental control is often associated with perceived parental hostility and rejection (Rohner & Rohner, 1981; Saavedra, 1980). The same parenting practice, however, was found to be constructed as a sign of parental involvement and concern among African Americans (Baldwin, Baldwin, & Cole, 1990; Cherian & Malehase, 2000; Lamborn, Dornbusch, & Steinberg, 1996), and was related to perceived parental warmth and acceptance in Korea (Rohner & Pettengill, 1985) and among Chinese adolescents (Chao, 1994; Lau & Cheung, 1987). Research also found that the authoritarian

parenting style, which was reportedly associated with negative adolescent adjustment among samples consisting of White males, was related to better behavioral outcomes among ethnic minority youth (Magnus, Cowen, Wyman, Fagen, & Work, 1999). Even in the similar culture, the findings are not always consistent. For example, Silbereisen, Meschke, and Schwarz (1996) found that higher levels of parental involvement were related to lower levels of adolescent depression in West Germany, but not in East Germany. In addition, although some researchers believe that, compared with their Western counterparts, Chinese parents may be more authoritarian and restrictive due to the cultural endorsement of parental authority (e.g., Chen et al., 1998; Lin & Fu, 1990), within each culture, the patterns of the relations between authoritative and authoritarian styles and child functioning may be similar (Chen, Dong, & Zhou, 1997; Lau & Cheung, 1987). These examples illustrate the difficulty of generalizing findings based on one culture to another, and thus warrant the investigation of parenting in different cultures.

### *The China Context*

Chinese culture is characteristically different from the Western culture in parenting in that (1) socialization of children is often “socially focused” – children are often told to attend to how others will think of their behaviors; (2) parental authority is often unquestioned. Obedience to and respect for parents, honoring ancestors, and financial support of parents when in need are still the fundamental values in Chinese culture (Ho, 1996); (3) parents often exercise high control, high involvement in their offspring’s lives, and high protectiveness; (4) parents and children themselves have high expectation in school achievement; (5) modesty is highly encouraged and appreciated (see Wang & Ollendick, 2001,

for detail discussion on each of the five aspects). It may be these characteristics that have attracted the studies of Chinese parenting styles (e.g., Chao, 1994; Chen, Dong & Zhou, 1997; Leung, Lau, & Lam, 1998). Given the unique Chinese culture, it is not hard to understand that although Chinese parents tend to be more power-assertive and controlling compared with Western parents, parental control and power assertion are often associated with care, concern, and involvement in Chinese culture (Chao, 1994; Chao & Sue, 1996). Recent studies in Chinese children investigating the effects of parenting behavior on children's psychological adjustment have shown that the incompetent and deviant behavior such as aggression, and other adjustment problems in children are associated with harsh, "simple,"<sup>1</sup> and "inappropriate" discipline (Fang, 1997; Li, 1998), with a conflictual familial atmosphere (Li & Hao, 1998), with parenting behavior centering on "providing materials but ignoring psychological needs" (Bian & Zheng, 1997), and with parental harshness, hostility and neglect (Qian & Xiao, 1998). Studies have also reported that warm and responsive parenting is positively related to adaptive behavior and emotional adjustment, and social and school competence in Chinese children (Chen et al. 2000; Qian & Xiao, 1998). In addition, parenting with "too much love," "over-involvement," and "over-protection" was found detrimental to child social and school adjustment (Li & Hao, 1998).

However, these studies have mainly drawn samples from *urban or suburban* areas in China. Little is known about how parenting may be associated with children's behaviors and adjustment in rural areas. From an ecological perspective (Bronfenbrenner, 1986), differences may exist because rural settings differ from metropolitan settings in important ways, creating distinct contexts for development (Crockett, Shanahan, & Jackson-Newsom, 2000). Given that the majority of China's school-aged children live in rural areas,<sup>2</sup> where

living conditions are often more difficult and family practices are much less well-documented, this sub-population is a significant one for understanding child development in China.

In a pilot study to examine the relationship between parenting and child internalizing problems in rural China, Liu (Liu, 2001) analyzed data from a sample of 1103 children in a poor rural area. Liu and colleagues (Liu et al. 2002) found that the relationship between parental warmth and child internalizing problems (both reported by children) differed depending upon child age and gender. Specifically, for younger boys (age 11), more parental warmth was found to be related to more internalizing problems; while for boys at age 12, more parental warmth predicted less internalizing problems. The findings from Liu et al.'s study illustrate the importance to look at the impact of parenting on child adjustment in rural settings. However, the former study has several limitations. First, it only analyzed data for children at ages 11 and 12. It is not clear whether the findings were due to the small age range or were truly reflecting the developmental effect. Second, the study only examined a few predictive variables, including parental behaviors, child age, gender, and sibship size. Based on the ecological-system model (Bronfenbrenner, 1986), the developmental contexts that may promote or undermine child development consist of a complex system of family, neighborhood, school, social and cultural activities, and the connections at all levels among these various contexts, together with their interactions with the developing individual (Bronfenbrenner, 1986; Rogoff, 1990; Vygotsky, 1978). As a result, in addition to parenting behaviors and individual characteristics (such as child age and gender), other familial parameters such as familial economic status, marital relationships, and parents' psychological well-being and their interactions with parental behaviors may be inherently bound together

to play a role in the outcomes of children's adjustment. Thus, it is important to put the relation between parenting and the child psychological functioning in the context of family and children's characteristics. In addition, given that Chinese parents and children put special attention to child school achievement, it is important to partial out the covariance between school achievement and child psychological adjustment when looking at the relationship between parenting and child well being. Third, the study only focused on child internalizing problems. Convincing evidence suggests that in addition to internalizing problems, externalizing behaviors is also an essential dimension of childhood adjustment problems (Achenbach, 1991; Achenbach & Edelbrock, 1978). To get a full picture of child adjustment in rural settings, it is informative to analyze child externalizing behaviors as well.

#### *The current study*

As an extension of the former study, the goal of the current investigation was to examine the relationships between parenting behaviors and children's psychological adjustment in the contexts of family and child characteristics in rural China. Special attention was given to examine the differences of the relationships across children's characteristics such as age, gender and school achievement and across other familial variables.

In summary, two research questions guided this study:

1. Are children's psychological problems related to parental practices after controlling for child's age, gender, school achievement, mother's psychological well-being, marital relationship, and other familial characteristics?
2. Do the relationships between parental practices and children's problems vary by individual and/or familial characteristics?

Literature consistently shows that different informants' reports about individual characteristics and behaviors typically do not correspond highly (Achenbach, McConaughy,

& Howell, 1987; Anderson, 1998; Feinberg, Neiderhiser, Howe, & Hetherington, 2001; Liu, 2001; Tien, Roosa, & Michaels, 1994; Wiersen, Forehand, & McCombs, 1988). Most research about Chinese child and adolescent psychological adjustment is based on questions administered to children and adolescents themselves. A more complete picture would emerge with the inclusion of different reports, including those from both children and parents. This study incorporates data reported by mothers and by children separately. This approach facilitates an examination of cross-informant differences in the relationships between parental behaviors and child adjustment.

## Method

### *Data*

The data analyzed in this study come from the Gansu Survey of Children and Families (GSCF). The GSCF is one of the first large-scale multi-level children's surveys undertaken in developing countries. The data collection occurred in June 2000. The survey included a primary sample of 2000 children aged 9-13 in 20 rural counties in Gansu,<sup>3</sup> an interior province in Northwest China (see Appendix A for the location of Gansu, see Appendix B for a description of sample strategy). In addition, information from five linkable secondary samples of children's mothers, household heads, home-room teachers, school principals, and village leaders was also collected. Among the 2000 sample children, about 54% are boys. The majority of the sample children (98%) are Han, the major ethnic group in China. About 93% of the children had at least one sibling. No differences are found in the distribution of gender across different ages ( $\chi^2=1.01$ ,  $p=.908$ ). Because initial analyses suggested that missing data was of trivial proportions and were missing at random, listwise deletion (where an entire case is discarded if any variable that is involved in the data analysis in the case is missing) was used. As a result, at most only less than two percent of the observations were omitted.

### *Measures*<sup>4</sup>

*Child internalizing problems and externalizing problems.* In this study, children's psychological problems were indexed by internalizing and externalizing problems (Cicchetti, & Toth, 1991; Noam, Paget, Valiant, Borst, & Bartok, 1994). Internalizing problems are characterized by the symptoms of withdrawal, anxiety, and depression. Externalizing behaviors include hyperactivity, aggression, and delinquency. Although these constructs

were originally used in the area of childhood psychopathology, researchers also use them as indicators of children's adjustment (e.g., Buysse, 1997). The items for measuring children's psychosocial adjustment were adapted from the internalizing and externalizing scales in the Child Behavior Checklist – CBCL and Youth-Self Report (YSR) (Achenbach, 1991). This study employed a subset of the items in Achenbach's YSR instrument, due to concerns about the time burden for respondent children.<sup>5</sup> Following field pretests and focus group sessions, a total of 44 items from Achenbach's YSR were kept in the Child Questionnaire and the Mother Questionnaire for measuring children's problems. Each item was rated in a 4-point scale, as "strongly disagree", "disagree", "agree", or "strongly agree". The indicator for the internalizing problem construct is a summative scale from eighteen items. These items cover symptoms of unhappiness, feelings of being unloved, mood swings, feelings of worthlessness, and feelings of being withdrawn. Higher scores in the internalizing problem scale indicate that the child expects an unhappy future, is pessimistic, feels unhappy, inferior, lonely, or moody, is unable to pay attention, and/or is easily tired. This summative scale had high internal consistency, with a Cronbach alpha of .82 for the children's report and .80 for the mothers' report. Similar to the internalizing problems, the indicators of children's externalizing problems were constructed separately for mothers and children by summing up the scores from the scales that were used to assess children's acting out, truancy, fighting, and delinquency. Principal component analysis indicates that children's externalizing problem scale is internally consistent, with Cronbach alpha .89 for children's reports, and .87 for mothers' reports.

*Parental warmth and parental punishment.* Among various aspects of parenting, parental warmth and punishment have received special attention from theorists and researchers (e.g., Chen, et al., 2000; MacDonald, 1992; Pettit, Bates, & Dodge, 1997; Qian & Xiao, 1998; Rollins & Thomas, 1979; Russell & Russell, 1996). This study measures these two aspects of parenting. Parental warmth is indicated by high levels of parental support and care, including encouragement, positive reinforcement, active involvement in children's lives, and appropriate monitoring and discipline (Pettit, Bates, & Dodge, 1997). Drawing on the concept of non-supportive parenting behavior defined by Rollins and Thomas (1979), parental punishment is indexed by parental hostility and neglect, harsh discipline, corporal punishment, unresponsiveness, and impatience.

The indicator for parental warmth is a summative scale based on 19 items, answered by children and mothers on a 3-point Likert scale. Respondents indicate the frequency (never, sometimes, often) with which certain parenting behaviors such as "your parents encourage you to study hard" (or, for mothers, "you encourage your child to study hard") take place. Higher scores on the parental warmth scale indicate that parents more frequently exercise positive reinforcement, encouragement, involvement, and reasoning, and pay more attention to their children. In this study, the summative parental warmth scale was internally consistent, with a Cronbach alpha of .78 for children, and .84 for mothers.

The indicator for the parental punishment construct is a summative scale based on 8 items answered by children and mothers on a 3-point Likert scale response. Respondents indicate the frequency (never, sometimes, often) with which certain parenting behaviors such as "your parents hit you whenever you do something wrong" take place. Higher scores in the parental punishment scale indicate that parents more frequently hit or spank their

children, and more often exercise criticism when their children do something wrong. The Cronbach alpha for this scale is .68 for children and .62 for mothers.<sup>6</sup>

As discussed earlier, children's perceptions of parenting behaviors and mothers' reports of parenting behaviors were considered to be distinct constructs in this study. Therefore, for the concepts of parental practices, four constructs were measured, namely, children's perceptions of parental warmth and punishment, and mothers' reports of parental warmth and punishment.

Although studies have shown that paternal and maternal parental styles may be different (e.g., Clausen, 1966; Paulson & Sputa, 1996; Forehand & Nousiainen, 1993) and may have different relations with child outcomes (e.g., Chen et al. 2000), research also supports the similarities between paternal and maternal parental behaviors (e.g., Baumrind, 1991; Smetana, 1995; Stice & Barrera, 1995). This study does not differentiate between maternal and paternal parental behaviors.

*Child age and gender.* Given the comprehensive biological and psychological changes accompanying children, especially those ages 9 and older who are at the stage of prepuberty or the onset of puberty (Brooks-Gunn & Reiter, 1990; Holmbeck, Paikoff, Brooks-Gunn, 1995; Paikoff & Brooks-Gunn, 1990) and may experience the transition from primary school to secondary school, it is valuable to explicitly examine whether the relationships between parenting behaviors and child adjustment vary with children's age or developmental level. Research has suggested that rural parents' long-term expectations of economic and emotional support from children differ systematically by gender (Hannum, 2002), but it is not clear whether these different expectations translate to different treatment of children in

realms such as parenting. Furthermore, little research conducted in rural China has examined gender differences in the relationship between parenting behaviors and children's adjustment. This study explicitly controlled for child gender, and investigated whether the relationship between parenting and children's internalizing behaviors was a function of gender. Information about child age and gender was provided by children's parents or primary caregivers.

*Child school achievement.* Child school achievement was measured by a standard mathematics / language (Chinese) test. The tests were designed by experts at the Gansu Educational Commission to cover the range of official primary school curriculum. On a random basis, half of the children did the mathematics part and the other half did the language part. To ensure that the tests assessed an appropriate range of knowledge given the child's education, separate exams were given to children in grades 3 and below and to children in grades 4 and above. The tests were scored from zero to 100. The scores were first standardized by grade level, and then standardized with mean 50 and stand deviation 10. Preliminary analysis shows that teachers' report of children's test scores in mathematics and those in language are highly correlated ( $r=.80$ ,  $p<.001$ ). When child adjustment was regressed on the mathematics score and on the language score separately, the slope coefficients from both models are similar (at about  $-.02$  with  $p<.001$ ) and both explain about 3% of the variation in child adjustment. These results suggest that it is reasonable to treat the standardized math and language score as comparable indicators of school performance.<sup>7</sup>

*Sibship size.* Although research suggests that family economic resources and parental emotional resources may be diluted in a family with more children (Richter, Richter, Eisemann, & Mau, 1997), the findings about the effect of family sibship size on children's adjustment are inconsistent (Buchmann & Hannum, 2001). For example, several studies have demonstrated that increased numbers of children within the family lead to less favorable child outcome, such as higher levels of behavior problems (Parcel & Menaghan, 1993) or lower levels of achievement or attainment (Blake, 1989; Hannum, 2002), but others reported that children reared in a small family tend to have more symptoms of psychopathology (DeAlmeida-Filho, 1984) or more egocentric (Jiao, Ji, & Jing, 1986). Given that sibship size in rural China larger than one remain common,<sup>8</sup> research controlling the sibship size is especially significant when examining the relationship between parenting behaviors and children's problems in rural areas. In this study, information about sibship size was provided by children's parents or primary caregivers.

*Parents' education and family wealth.* Research concerning the association between financial resources and children's developmental outcomes found that children whose families are in poverty or have experienced chronic financial pressures are more likely to experience depression and anxiety, or to have antisocial behavior (Bolger, Patterson, Thompson, & Kupersmidt, 1995; Duncan, Brooks-Gunn, & Klebanov, 1994; also see Samaan, 2000 for a review). In addition, low educational levels among parents were found to be related to children's overall problem behaviors (Dishion, Patterson, Stoolmiller, & Skinner, 1991). In this study, information about parents' education and family wealth was collected based on the Household Questionnaire which was answered by the father, the

mother, or other family head (e.g. grandparents) when parents were not available. The parents or other family head were asked about the value of their house and the values of each of the other family assets such as television, radio, bicycle, and furniture etc. The sum of the values of all the family assets is used as an index of family wealth.

*Mothers' psychological well-being.* It has been argued that mothers who are depressed or not satisfactory in their lives are less likely to positively interact with their children and that relations between parenting and child behavior may be moderated by parental affect (Baumrind, 1991; Darling & Steinberg, 1993; Rubin, Stewart, & Chen, 1995). Furthermore, mothers' depression was found to be negatively associated with child adaptive functioning (Downey & Coyne, 1990; Cummings & Davies, 1994; Gotlib & Goodman, 1999; Gotlib & Lee, 1996). In this study, two indicators were used to represent mothers' psychological well-being: mother's satisfaction with herself and her life and mother's negative feeling. For measuring satisfaction, mothers rated 3 items on a 4-point Likert scale to indicate whether they "strongly disagree", "disagree", "agree", or "strongly agree" a statement such as "overall, you are satisfied with your life". The indicator of mothers' satisfaction was constructed by summing the scores from the 3 items. The Cronbach alpha for this scale is .67.

In addition, mothers' response to the statement "I have had bad appetite for a period (in the past month)" based on a 4-point scale (from "strongly disagree" to "strongly agree") was used as an index of mothers' negative feeling. Although literally the item asks about mothers' appetite, a physical symptom, it could be a good proxy for mother's negative affect in the context of poor rural China. According to Kleinman (1986), the somatic symptoms may be the expression of interpersonal and personal distress (e.g. frustration, despair,

depression) in an idiom of bodily complaints in Chinese. One possible reason is that, "[F]or most working class Chinese who are used to more concrete modes of expression, conceptualization at the psychic level may seem too abstract" (Kleinman, 1986). Furthermore, it may be that Chinese are less likely to express their depressive feeling in words because the culturally shaped psychological processes lead Chinese to suppress distressing emotions. Another reason is that Chinese culture values the harmony of social relations over the expression of potentially disruptive and ego-centered intrapsychic experience (Shweder & Bourne, 1984). The open verbal expression of personal distress outside close relations is viewed as embarrassing and shameful, and is negatively evaluated (Kleinman, 1986). Thus, somatization may be a cognitive style of communicating inward feelings in outward somatic terms.

*Marital relationship.* Significant correlations with internalizing and externalizing problems in children have been found in the families with marital distress or discord (Emery, 1982; Emery & Kitzmann, 1995; Grych & Fincham, 1990) and with interparental conflict (Davies & Cummings, 1994; Martin & Clements, 2002; also see Zimet & Jacob, 2001 for a review). Children's exposure to marital conflict, spousal physical aggression, and child-rearing disagreements all may play a role in children developing adjustment problems (Jouriles, et al., 1991; Jouriles, Murphy, & O'Leary, 1989; Lahey, Hartdagen, Frick, McBurnett, Connor, & Hynd, 1988). In this study, the quality of marital relationship was measured by two indicators: spouse caring for each other and spouse sharing information and responsibilities. The spouse-care scale includes five statements. Mothers responded to each statement on a 3-point Likert scale by indicating the frequency (never, sometimes, often) with which certain things such as "*your spouse easily noticed if you felt unhappy*" take place.

The Cronbach alpha for this scale is .79. The spouse-share scale contains seven items. Mothers responded to each item by indicating who (your spouse, you, or together) was responsible for making decisions on certain things such as “*child schooling*” or “*how to discipline child*”. The Cronbach alpha for this scale is .75.

### *Procedure*

To enhance rapport and cultural understanding, graduates from a local university and staff from a local statistics bureau served as home visitors to collect data from the target children, the families, the communities, and the schools. Prior to data collection, the visitors / interviewers received a week of intensive training in how to administer the self-report instruments and to conduct interviews.

Two home visits, each lasting about 2 hours, were made to each family within a week period, as the families' schedules allowed. During the first visit, informed consent forms<sup>9</sup> were completed. The mother or/and father consented to her own and her child's participation in the survey. The mother also provided the name and location of the child's school, and authorized the child's teacher to provide the interviewers with information concerning the child's functioning at school. The detail of the procedure is described in earlier studies (Liu, 2001; Liu et al. 2002).

### *Analytic Plan*

To examine the unique contributions of parenting to child outcomes, multiple regression analysis was used in this study. As discussed earlier, information about parenting behaviors and children's outcomes was obtained, separately, from children and from their

mothers. As a result, this study examines four outcome variables, i.e. child internalizing problems and externalizing behaviors reported by children themselves and by their mothers.

Table 1. Descriptions, Means, Standard Deviations, and Ranges of the Variables

Variables Description	N	Mean (Std. Dev)	Range
<i>Outcome variables</i>			
children's report of internalizing score	1999	39.93(8.11)	18-72
children's report of externalizing score	1999	34.41(9.24)	18-72
mother's report of her child's internalizing scores	2000	38.89(5.26)	18-66
mother's report of her child's externalizing scores	1999	34.79(5.70)	18-59
<i>Question variables</i>			
children's report of parental warmth score	1999	41.30(5.66)	19-57
children's report of parental punishment score	1999	13.05(3.13)	8-24
mother's report of parental warmth score	2000	44.14(5.56)	24-57
mother's report of parental punishment score	2000	13.68(2.53)	8-22
<i>Covariates</i>			
mother's negative feeling	1991	2.21 (0.82)	0-4
mother's overall satisfaction to life	1998	8.84 (1.43)	3-12
marital relation (spouse caring of each other)	1974	11.66(2.26)	5-15
marital relation (spouse sharing of information and responsibilities)	1974	16.22(3.76)	7-21
log2 of family wealth	2000	13.24(1.37)	6.85-17.68
children's test score (standardized with mean 50, std. 20)	1999	50 (20.02)	18.9-112.7
<i>Control variables</i>			
children's age	2000	11.03(1.09)	7.67-13.42
children's gender: 1=male, 0=female	2000	0.54 (0.50)	0-1
father's education in years	1999	6.98 (3.52)	0-18
mother's education in years	1996	4.17 (3.52)	0-12
number of children in the family	2000	2.31 (0.72)	1-6

The question variables used to explain the variations in child outcomes include children's report of parental warmth and parental punishment, and mother's report of parental warmth and parental punishment. Table 1 presents the means, standard deviations, ranges, and brief descriptions of these variables, together with the control variables and covariates. Because the relationship between family wealth and each of the outcome variables is non-linear as revealed by the bivariate scatter-plots, family wealth was log base 2 transformed. For the ease of interpretation of the age effect, age was centered on the overall mean.

Separate regressions were conducted for each outcome variable, and thus, the number of observations included in each regression model varied ( $N$ s ranged from 1961 to 1995). The predictive variables were entered into the regression model in such an order that control variables were entered first, followed by the covariates such as child school achievement, family wealth, mother's satisfaction and mother's report of negative symptom, and marital care and share. At each step, the interactions between gender, age, and each of the other variables in the model were tested. Then the question variables, parental warmth and punishment, were entered. At the last step, the interactions between the question variables and each of the other variables in the model were also tested. In each model, if the contribution of the added variable(s) to the  $R^2$  was non-significant, it would not be included in the next step model building. In the process of model building, tolerance statistics was examined to test for collinearity or multicollinearity. Cook's  $D$  and Hat statistics were also examined to detect, if any, the presence of "aberrant" or atypical observations. If atypical observations were identified, a sensitivity analysis was conducted by deleting the atypical observations to see whether and how the estimates of parameters were influenced. An alpha of .10 was used as the criterion for retaining variables in the model-building process.

## **Results**

### **Intercorrelations Among the Predictive Variables and Outcomes**

The intercorrelations among the predictive variables are presented in Table 2. The overall magnitudes of the correlations among the predictors were low. There were moderate correlations among some of the family variables, such as mother's education and father's education, family wealth, and child test scores. The correlations among variables reported by mothers were relatively strong. For example, parental warmth reported by mothers was moderately related to mother's satisfaction to life. The intercorrelations among the child outcomes and the correlations between the predictive variables and each of the child outcomes are presented in Table 3. The correlations within source were fairly strong, whereas the correlations across sources were low, even within construct. Given the intercorrelation between the predictive variables, multiple regression was necessary in order to access the unique effect of parenting behaviors on child internalizing and externalizing problems.

Table 2. Intercorrelations Among the Predictive Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Parental warmth (child reported)	—													
2. Parental punishment (child reported)	-.07**	—												
3. Parental warmth (mother reported)	.12***	.08***	—											
4. Parental punishment (mother reported)	-.04*	.14***	.08***	—										
5. Child age	.15***	.16***	-.03 ns	-.04~	—									
6. Number of children in the family	.007ns	.02 ns	.12***	.02 ns	.07**	—								
7. Child test score	.10***	.16***	.07**	.12***	.07**	-.05*	—							
8. Mother education	.11***	.12***	.27***	.12***	.001 ns	.13***	.18***	—						
9. Father education	.06**	.12***	.19***	.11***	.04~	.01 ns	.14***	.37***	—					
10. Log2 family wealth	.04~	.15***	.15***	.12***	.07**	.08***	.12***	.26***	.25***	—				
11. Mother negative feeling	.06**	.05*	.04*	.02ns	.04~	.07**	.001ns	.01ns	.07**	-.04~	—			
12. Mother's satisfaction to life	.07**	.01ns	.26***	-.05*	.04~	-.02ns	.03ns	.09***	.08***	.15***	.04~	—		
13. Spouse caring of each other	.05*	-.02ns	.44***	-.08**	.008ns	.08***	.04~	.06**	.03ns	.09***	-.07**	.17***	—	
14. Spouse sharing of information and responsibilities)	.01ns	-.05*	.20***	-.04*	.006ns	-.05*	.09***	.14***	.06**	.04**	.009ns	.12***	.21***	—
MEAN	41.29	13.05	44.09	13.67	0.03	2.31	50	4.15	6.95	13.23	2.22	8.82	11.66	16.22
STD	5.66	3.13	5.58	2.55	1.09	0.72	19.99	3.52	3.54	1.37	0.82	1.45	2.26	3.76
N	1999	1999	2000	2000	2000	2000	1999	1996	1999	2000	1991	1998	1974	1974

Note: ~p<.10, \*p<.05, \*\*p<.01, \*\*\*p<.001, ns – non-significant.

Table 3. Intercorrelations Among the Child Outcomes and Correlations between Predictive Variables and Each of the Child Outcomes

	Internalizing problems		Externalizing problems	
	child	mother	child	mother
<i>Outcome variables</i>				
Internalizing problems (child reported)	—			
Internalizing problems (mother reported)	.03 <sup>ns</sup>	—		
Externalizing problems (child reported)	.83***	.04~	—	
Externalizing problems (mother reported)	.07**	.75***	.08***	—
<i>Predictive variables</i>				
1. Parental warmth (child reported)	-.04 <sup>ns</sup>	-.04~	-.10***	-.04~
2. Parental punishment (child reported)	.36***	.05*	.38***	.07**
3. Parental warmth (mother reported)	-.05*	-.08***	-.08***	-.10***
4. Parental punishment (mother reported)	.08***	.14***	.10***	.11***
5. Child age	-.15***	-.03 <sup>ns</sup>	-.20***	-.02 <sup>ns</sup>
6. Number of children in the family	.05*	.03 <sup>ns</sup>	.05*	.01 <sup>ns</sup>
7. Child test score	-.14***	-.03 <sup>ns</sup>	-.16***	-.04~
8. Mother education	-.09***	-.07**	-.07**	-.08***
9. Father education	-.08***	-.03 <sup>ns</sup>	-.08***	-.02 <sup>ns</sup>
10. Log2 family wealth	-.11***	-.01 <sup>ns</sup>	-.10***	-.002 <sup>ns</sup>
11. Mother's negative feeling	.04~	.17***	.01 <sup>ns</sup>	.12***
12. Mother's satisfaction to life	.02 <sup>ns</sup>	-.07**	.02 <sup>ns</sup>	-.15***
13. Spouse caring of each other	-.02 <sup>ns</sup>	-.15***	-.03 <sup>ns</sup>	-.15***
14. Spouse sharing of information and responsibilities)	-.05*	-.10***	-.05*	-.09***
MEAN	39.98	38.89	34.42	34.79
STD	8.11	5.23	9.22	5.68
N	1999	2000	1999	1999

Note: ~p<.10, \*p<.05, \*\*p<.01, \*\*\*p<.001, ns – non-significant.

### Results of Multiple Regression Models

The estimates of the ordinary least square (OLS) regression for a series of models examining the relationship between parenting behaviors and child adjustment, controlling for other variables, are presented separately for each outcome variable in Table 4 and Table 5. The examination of the residual for each model did not find violation of the model assumptions. Tolerance statistics for each “final” model did not show that multicollinearity would be a problem.

The predictive variables, grouped by question variables, control variables, covariates, and the interaction terms are described in the left-hand column of Tables 4 and 5. The findings on child internalizing problems are presented in Table 4 and those for child externalizing problems are found in Table 5. In each table, results are reported separately for the child outcomes from different data sources (child and mother). The first two columns show the results of the models containing the main effects of parental behaviors after controlling for the other variables and their significant interactions, the last two columns list the results of the models containing the significant interaction terms between parental behaviors and the other variables, controlling for the other variables and their significant interactions. Given that the focus of this study is on parenting behaviors, parental warmth or punishment remained in the model even if it is not significant (for the same source).  $R^2$  statistics and root mean square error (RMSE) of each model are presented in the last two rows. The results are discussed in terms of the significance of parental warmth and punishment across the different domains of child psychological adjustment.

Table 4. The Fitted Multiple Regression Models in Which Child Internalizing Problems Are Predicted by Parenting Practices, Controlling for Demographic Variables and Other Familial Characteristics

Source	main effect models		interactions models	
	Child Model 1	Mother Model 2	Child Model 3	Mother Model 4
N	1995	1963	1995	1961
Intercept	28.317	38.646	19.528	42.49
	(1.68***)	(2.12***)	(4.25***)	(2.22***)
<i>Parental Practices: Question Variables</i>				
Parental punishment (child reported)	.842		.833	
	(.05***)		(.05***)	
Parental warmth (child reported)	.017		.233	
	(.03 <sup>ns</sup> )		(.09*)	
Parental punishment (mother reported)		.259		.132
		(.04***)		(.07*)
Parental warmth (mother reported)		.006		-.003
		(.02 <sup>ns</sup> )		(.02 <sup>ns</sup> )
<i>Selected Demographics: Control Variables</i>				
Child age (centered at 11)	-.720		1.615	
	(.15***)		(1.16 <sup>ns</sup> )	
Child gender (1=male)	1.228	-4.068	1.327	-10.09
	(.93 <sup>ns</sup> )	(2.48 <sup>ns</sup> )	(.93 <sup>ns</sup> )	(2.68***)
Mother's education in years	-.216	-.080	-.204	-.070
	(.07**)	(.03*)	(.07**)	(.03*)
Number of children in the family	.508		4.276	
	(.23*)		(1.66*)	
<i>Other Child and Family Related Variables: Covariates</i>				
Child test score (standardized mean=50, std=20)	-.008		-.008	
	(.01 <sup>ns</sup> )		(.01 <sup>ns</sup> )	
Log2 family wealth		-.076		-.096
		(.12 <sup>ns</sup> )		(.13 <sup>ns</sup> )
Mother's negative feeling		1.123		1.103
		(.14***)		(.14***)
Mother's satisfaction to life		-.034		-.182
		(.11 <sup>ns</sup> )		(.08*)
Spouse caring of each other		-.258		-.265
		(.05***)		(.06***)
Spouse sharing of information and responsibilities		-.083		-.085
		(.03**)		(.03**)
<i>Interactions</i>				
Parental warmth (child reported) * age			-.056	
			(.02*)	
Parental warmth (child reported) * number of children			-.091	
			(.04*)	
Parental punishment (mother reported) * child gender				.24
				(.09**)
Mother's education * child gender	.254		.243	
	(.09**)		(.09*)	

Table 4. (Continued)

Source	main effect models		interactions models	
	Child Model1	Mother Model2	Child Model3	Mother Model4
Child test score * child gender	-.041 (.01*)		-.041 (.01*)	
Log2 family wealth * child gender		.483 (.16**)		.506 (.17**)
Mother's satisfaction to life * child gender		-.273 (.16~)		
R-square	15.28%	8.26%	15.74%	8.60%
Root mean square error (RMSE)	7.490	5.050	7.474	5.08

Note:

1. ~ $p < .10$ , \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ , ns – non-significant.
2. The number in parenthesis is standard error.

#### *Findings on child internalizing problems*

Models 1 and 2 in Table 4 show the main effects of parental warmth and punishment on child internalizing problems, separately for different data sources. After controlling for the significant child characteristics, familial variables, and the interactions among these variables, parental punishment is positively related to internalizing problems ( $r = .842$ ,  $p < .001$  for child source,  $r = .259$ ,  $p < .001$  for mother source). Parental warmth, however, has no main effect on child internalizing problems ( $r = .017$ ,  $p > .10$  for child source,  $r = .006$ ,  $p > .10$  for mother source) after controlling for the other variables in the models. Models 3 and 4 show the effects of the significant interactions between parental behaviors and the other variables. Model 3 shows that parental punishment reported by children has no interaction with any other variables in the model, indicating that the effect of parental punishment on child internalizing problems (both reported by child) does not vary. Differently, parental punishment reported by mothers has significant interaction with child gender ( $r = .24$ ,  $p < .01$ , Model 4), meaning that from the mothers' perspective, the magnitude

of the effect of parental punishment on child internalizing problems is bigger for boys than for girls, as shown by the steeper line for boys in Figure 1. Parental warmth reported by mothers still has no significant explanatory power in accounting for the variance unexplained in child internalizing problems in the interaction model (Model 4).<sup>10</sup>

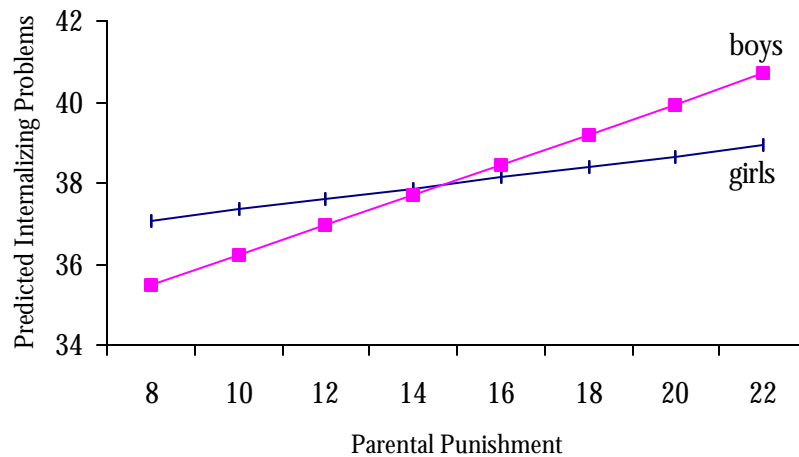


Figure 1. The Effect of Parental Punishment on Child Internalizing Problems as a Function of Child Gender

*Data Source: Mother, Model 4*

Although the main effect of parental warmth is non-significant for child report data (Model 1), the interactions of parental warmth reported by children with child age<sup>11</sup> ( $r = -.056$ ,  $p < .05$ ) and with the number of children in the family ( $r = -.091$ ,  $p < .05$ ), respectively, are significant in predicting child self-reported internalizing problems (Model 3). That is, the relationship between parental warmth that the child perceived and the internalizing problems s/he reported is moderated by child age and sibship size. Figure 2 graphically displays this changing relationship between parental warmth and child internalizing problems as a function of child age and sibship size.

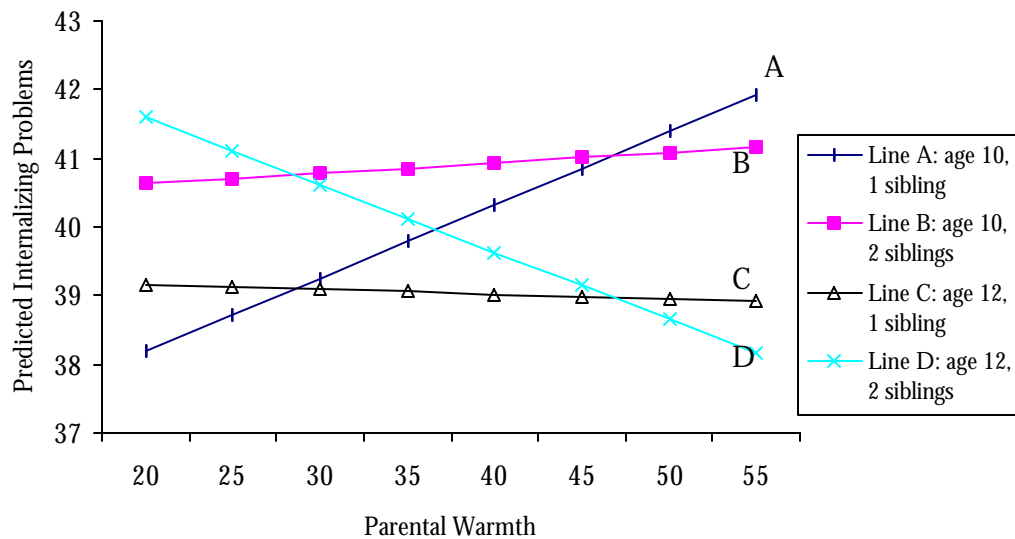


Figure 2. The Effect of Parental Warmth on Child Internalizing Problems as a Function of Child Age and Sibship Size for Girls

*Data Source: Child, Model 3*

The comparison of line A (for children at age 10, with 1 sibling) and line B (for children at age 10, with 2 siblings) in Figure 2 clearly shows that the number of children in the family moderates the relationship between parental warmth and child internalizing problems based on children's report. Specifically, on average, with every one additional child in a family, the magnitude of the slope of the effect of parental warmth on children's internalizing problems falls .091 ( $r = -.091$  for the interaction of parental warmth and sibship size), controlling for all the other variables in the model. Further, the comparison between line D (for children at age 12, with 2 siblings) and line B (for children at age 10, with 2 siblings) reveals the moderating role that child age plays in the relationship between parental warmth and child internalizing problems. Specifically, on average, for children who are one year older, the magnitude of the effect of parental warmth on their internalizing problems falls .056 ( $r = -.056$  for the interaction of parental warmth and child age), holding all the other variables in the model constant. It is clear that the direction and the magnitude of the

relationship between parental warmth and child internalizing problems depends on the combination of child age and sibship size. At some combinations (e.g., for younger children with fewer siblings), higher parental warmth is related to more child internalizing problems, while at other combinations (e.g., for older children with more siblings), higher parental warmth predicts fewer child internalizing problems.

In addition to parental behaviors, the models in Table 4 also show that mother's education, child age, gender, school achievement, sibship size, and some of the interactions among these variables are also significant in predicting child internalizing problems reported by child (Model 3). Family wealth, marital relationships, and mother's psychological well-being are also found to be significant in the model using mother's reported data (Model 4). The details of these effects are left for readers of interest.

#### *Findings on child externalizing behaviors*

Models 5 and 6 in Table 5 show the main effects of parental warmth and punishment on child externalizing problems, separately for different sources. After controlling for the significant child characteristics, familial variables, and the interactions among these variables, parental punishment is positively related to child externalizing problems ( $r=1.008$ ,  $p<.001$  for child source,  $r=.207$ ,  $p<.001$  for mother source). Parental warmth reported by children is negatively associated with their self-reported externalizing problems ( $r=-.072$ ,  $p<.05$ ). Mother's report of parental warmth, however, has no main effect on child externalizing problems ( $r=-.005$ ,  $p>.10$ ) after controlling for the other variables in the models.

Table 5. The Fitted Multiple Regression Models in Which Child Externalizing Problems Are Predicted by Parenting Practices, Controlling for Demographic Variables and Other Familial Characteristics

Source	main effect models		interactions models	
	Child Model5	Mother Model6	Child Model7	Mother Model8
N	1995	1963	1995	1962
Intercept	24.244 (1.88***)	34.515 (1.92***)	18.803 (2.98***)	35.406 (2.13***)
<i>Parental Behaviors: Question Variables</i>				
Parental punishment (child reported)	1.008 (.06***)		1.283 (.16***)	.084 (.04*)
Parental warmth (child reported)	-.072 (.03*)		-.025 (.04 <sup>ns</sup> )	
Parental punishment (mother reported)		.207 (.04***)		.043 (.07 <sup>ns</sup> )
Parental warmth (mother reported)		-.005 (.02 <sup>ns</sup> )		-.003 (.02 <sup>ns</sup> )
<i>Selected Demographics: Control Variables</i>				
Child age (centered at 11)	-1.100 (.17***)	.936 (.59 <sup>ns</sup> )	1.600 (1.29 <sup>ns</sup> )	1.019 (.59~)
Child gender (1=male)	1.385 (1.04 <sup>ns</sup> )	2.767 (1.10*)	-8.523 (5.43 <sup>ns</sup> )	-1.464 (1.77 <sup>ns</sup> )
Mother's education in years	-.140 (.08~)	-.111 (.03**)	-.149 (.08~)	-.106 (.03**)
Number of children in the family	.595 (.26*)		.602 (.26*)	
<i>Other Child and Family Related Variables: Covariates</i>				
Child test score (standardized mean=50, std=20)	-.021 (.01 <sup>ns</sup> )		.056 (.04 <sup>ns</sup> )	
Log2 family wealth		.255 (.09**)		.269 (.09**)
Mother's negative feeling		.836 (.15***)		.825 (.15***)
Mother's satisfaction to life		-.514 (.09***)		-.514 (.09***)
Spouse caring of each other		-.245 (.06***)		-.251 (.06***)
Spouse sharing of information and responsibilities		-.006 (.04 <sup>ns</sup> )		-.005 (.04 <sup>ns</sup> )
<i>Interactions</i>				
Parental warmth (child reported) * age			-.064 (.03*)	
Parental warmth (child reported) * child gender			.234 (.13~)	
Parental warmth (child reported) * child gender * child test score			-.007 (.00**)	
Parental punishment (child reported) * child test score			-.006 (.00*)	

Table 5. (Continued)

Source	main effect models		interactions models	
	Child Model5	Mother Model6	Child Model7	Mother Model8
Parental punishment (mother reported) * child gender				.298 (.09**)
Mother's education * child gender	.257 (.10*)		.280 (.10*)	
Child test score * child gender	-.038 (.01*)		.244 (.09*)	
Spouse caring of each other * child age		-.089 (.04~)		-.092 (.04~)
Spouse sharing of information and responsibilities * child gender		-.121 (.06~)		-.114 (.06~)
R-square	18.34%	7.65%	19.16%	8.31%
Root mean square error (RMSE)	8.358	5.489	8.324	5.472

Note:

1. ~ $p < .10$ , \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ , ns – non-significant.
2. The number in parenthesis is standard error.

Models 7 and 8 are the models including significant interactions between parental behaviors and the other variables. The interaction between parental punishment reported by children and child test scores is significant ( $r = -.006$ ,  $p < .05$ , Model 7), indicating that the effect of parental punishment on child externalizing problems (both reported by the child) varies by child school achievement. Specifically, controlling for the other variables in the model, children who reported more parental punishment tended to report higher externalizing problems (given that the maximum value for test score is 112). However, compared to children who had lower test score, the magnitude of the effect of parental punishment on child externalizing behaviors is smaller for those with higher test score. Figure 3 graphically displays these relationships, in which the slope of parental punishment on child externalizing problems for those with lower achievement score (denoted by line A) is steeper than that for those with higher test score (denoted by line B), controlling for the

other variables. Figure 3 also shows the effect of interaction between school achievement and gender. I did not discuss it in this paper since it is not the focus of this study. Readers with interest are encouraged to look at it in detail.

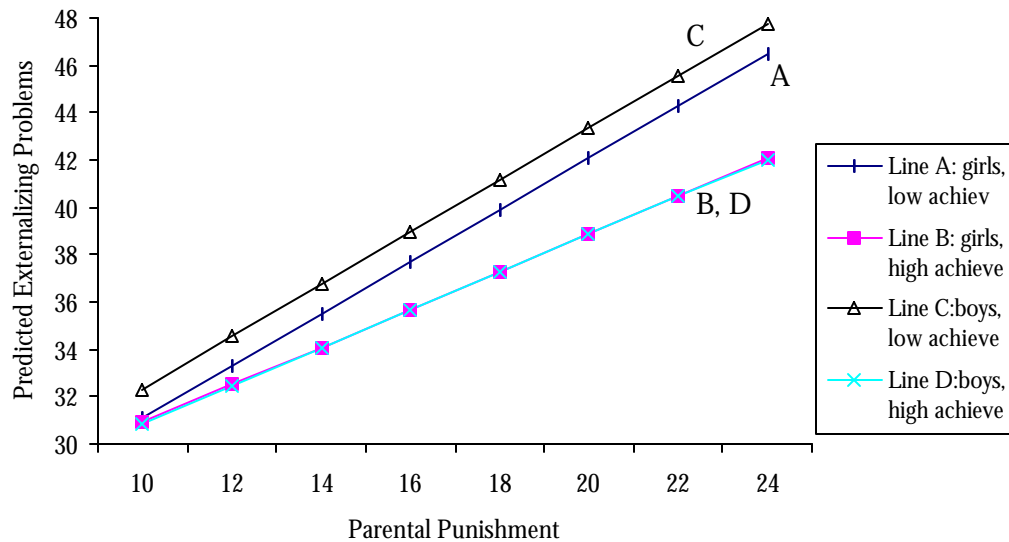


Figure 3. The Effect of Parental Punishment on Child Externalizing Behaviors as a Function of Child Achievement & Gender

*Data Source: Child, Model 7*

As shown in Model 8 (Table 5), parental punishment reported by mothers has significant interaction with child gender ( $r=.298$ ,  $p<.01$ ), indicating that controlling for the other variables in the model, mothers who reported more parental punishment overall tended to report higher externalizing problems in boys than in girls. For girls ( $SEX=0$ ), although the relation between parental punishment and child externalizing behaviors is positive, the magnitude of this relationship is negligible (only .043). Figure 4 displays this relationship. Again, parental warmth reported by mothers has no relationship with child externalizing problems also reported by mothers in the interaction model (Model 8).

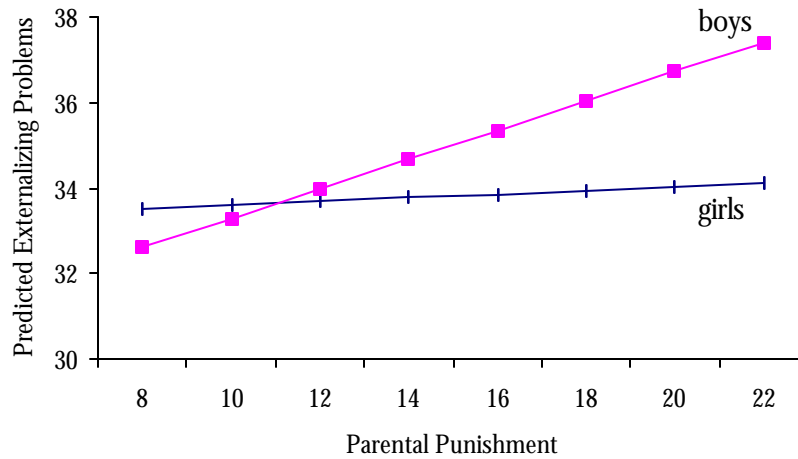


Figure 4. The Effect of Parental Punishment on Child Externalizing Problems as a Function of Child Gender

*Data Source: Mother, Model 8*

However, based on the child report (Model 7), the interactions of parental warmth with child age ( $r = -.064$ ,  $p < .05$ ) and child gender ( $r = .234$ ,  $p < .10$ ), respectively, are significant. Furthermore, the three-way interaction between parental warmth, child gender, and school achievement is also significant ( $r = -.007$ ,  $p < .01$ ). These interactions indicate that the effect of parental warmth on child externalizing behaviors (both reported by children) depends on child age, gender, and test score. For girls (SEX=0), the effect of parental warmth on child externalizing behaviors differs by child age, as shown in Figure 5; while for boys, the effect differs depending on both child age and school achievement, as illustrated in Figure 6. The different slopes of line A (for 10 years old boys) and line B (for 12 years old boys) in Figure 6 show how the effect of parental warmth on child externalizing behaviors differs by child age, while the different slopes for line A (for boys with lower test score) and line C (for boys with higher test score) shows the interaction between parental warmth and school achievement.

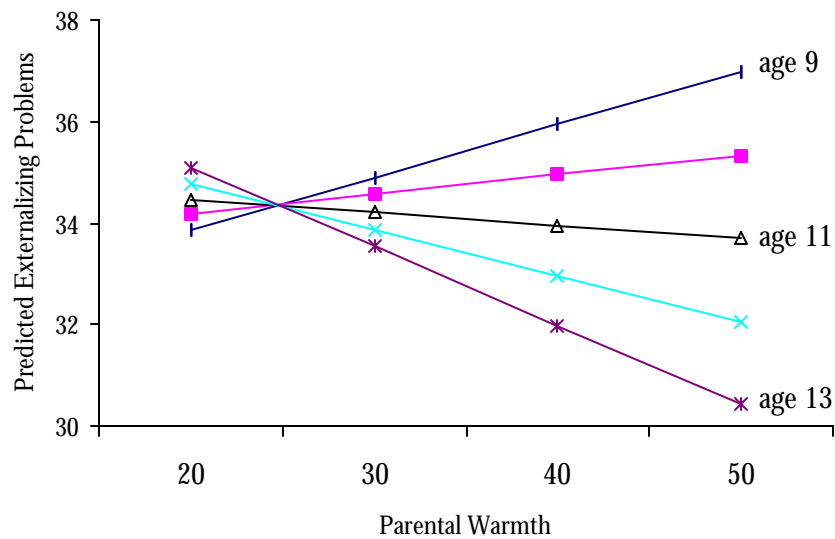


Figure 5. The Effect of Parental Warmth on Child Externalizing Behaviors as a Function of Child Age for Girls

*Data Source: Child, Model 7*

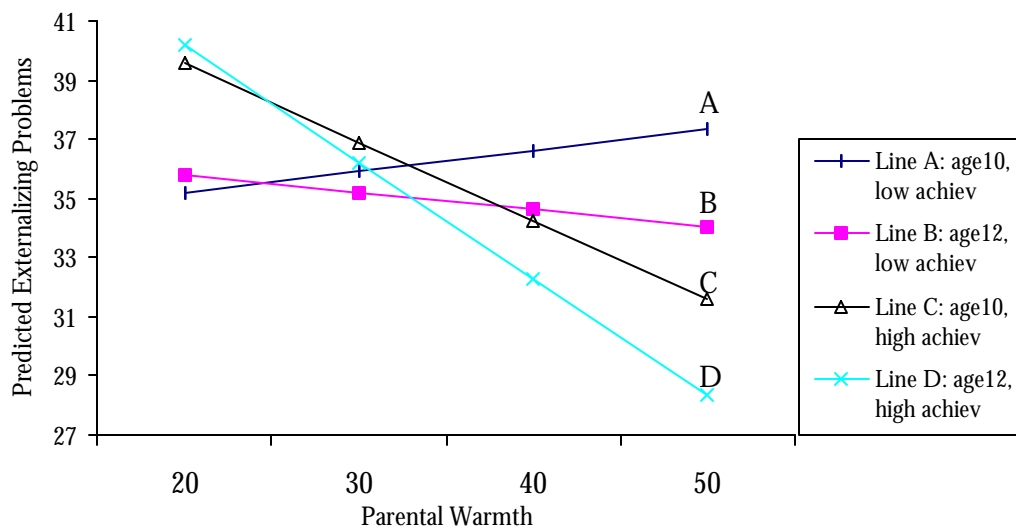


Figure 6. The Effect of Parental Warmth on Child Externalizing Behaviors as a Function of Child Age & School Achievement for Boys

*Data Source: Child, Model 7*

In addition to parental behaviors, the models in Table 5 also show that mother's education, child age, gender, school achievement, sibship size, and some of the interactions among these variables are also significant in predicting child externalizing problems reported by child (Model 7). Family wealth, marital relationships, and mother's psychological well-being are also found to be significant in the model using mother's reported data (Model 8).

#### *Findings from different data sources*

Table 6 is a summary of the findings based on child report and mother report. It clearly shows that there is no cross-informant effect in terms of the relationships between parental behaviors and child internalizing and externalizing problems except that children's report of parental punishment is found to be associated with mother's report of child externalizing problems ( $r=.084$ ,  $p<.05$ , Model 8 in Table 5). In addition, there are several noticeable differences in terms of the relationships between parenting behaviors and child psychological adjustment between the two data sources.

Table 6. Summary of the Main Effect and Interaction Effect of Parental Warmth and Punishment on Child Internalizing and Externalizing Problems by Data Source

		Child Internalizing Problems		Child Externalizing Problems	
	sources	child	mother	child	mother
<i>Main effect</i>					
Parental warmth	child			yes	
	mother				
Parental punishment	child	yes		yes	Yes
	mother		yes		Yes
<i>Interaction effect</i>					
Parental warmth	child	with child age, and sibship size		with child age, gender, and gender*achievement	
	mother				
Parental punishment	child			with achievement	
	mother		with child gender		with child gender

First, as seen in Table 6, based on child report, the relationship between parental warmth and child internalizing problems differ by child age and sibship size. In addition, parental warmth influences child externalizing problems differently depending upon child age, gender, and the combination of gender and school achievement. However, based on mother report, parental warmth has no relationship with child problems.

Second, in addition to parenting behaviors, child internalizing and externalizing problems (reported by children), respectively, are also related to child characteristics such as age, gender, school performance, and sibship size, but not with other familial variables reported by mothers, such as family wealth, marital relationships, and mothers' psychological status. In contrast, these mothers' reported familial variables are related to child internalizing and externalizing problems (also reported by mothers) after parental behaviors and child characteristics are taken care of.

Third, the R-squares for the models based on child reported outcomes (15.7% for internalizing problems and 19.2% for externalizing problems) are much higher than those based on mother reported outcomes (8.6% for internalizing and 8.3% for externalizing).<sup>12</sup> In addition, the magnitude of the effect of parental punishment for child data is much bigger than that for mother data. Although the slope coefficient is not standardized, the same scales in the related variables for both child and mother data allow this comparison. This suggests that from the children's perspective, parental punishment is more detrimental to their adjustment than from the mothers' perspective. Finally, from the child perspective, school achievement affects the relationship between parental punishment and child externalizing problems; while from the mothers' view, parental punishment influences boys' adjustment more than girls'.

## **Discussion**

The goal of this study was to examine the relationships between parenting behaviors and child psychological adjustment in *rural* China. The present study differs from previous research in several ways. First, I examined parenting influences among a large sample of children from poor rural area in China, a population that has received little attention in child development research. Second, the study was designed to identify the contributions of parental warmth and punishment to children's psychological adjustment in the contexts of familial variables and child characteristics. This focus follows the “ecological theory” and acknowledges the interrelations among the diverse contexts in which development occurs. Third, this study analyzed data from different sources, which provided a more complete picture about the parenting-child outcomes relationship.

### *Relationship between parental punishment and children's psychological adjustment*

In line with the findings in the literature, this study shows that in rural China, children whose parents use harsh discipline and show high levels of criticism are more likely to present internalizing and externalizing problems, whether based on children's report or on mothers' report. Further, from the children's perspective, parental punishment is harmful to their psychological adjustment, but it is not as harmful for children with better school performance as for those with poor school achievement. This suggests the “buffer” or “protective” effect of school achievement on the detrimental impact of parental punishment on child externalizing behaviors. While children who experienced more parental punishment tend to have more externalizing behaviors, those who do well at school (which is highly valued in Chinese culture) can usually get more attention and praise from their teachers,

peers, parents, and other family members. It is likely that the special attention and applause will help counteract the negative impact of parental punishment.

On the other hand, from the mothers' perspective, parental punishment is more detrimental to boys' psychological adjustment than to girls'. It is not clear whether this implies that, in rural China, boys are more sensitive or vulnerable to parental punishment or that girls are more resilient. It may be that, from the mothers' perspective, parents tend to exercise harsher discipline on boys than on girls (this is true based on the data). It may be equally likely that parental punishment experienced by boys somehow differs by that experienced by girls. For example, parents may respond to boys' misbehavior by corporal punishment like hitting or spanking, while to girls, they may exercise more verbal criticism like shouting or neglect. Alternatively, it is possible that mothers have different views for boys and for girls on their psychological health.

#### *Relationship between parental warmth and children's psychological adjustment*

Although the literature well documents that children whose parents are supportive and encouraging grow up healthier psychologically (e.g., Booth et al., 1994; Chen et al., 2000) and that children who experience low levels of parental care and support are prone to behavioral and psychological problems (e.g., Eisenberg et al. 1999), the positive effect of parental warmth on child psychological well-being does not always hold true in this study. Based on the child report, the same parental warmth perceived by children is associated with more internalizing or externalizing problems in younger children than in older children. This suggests that older children are more likely to be able to appreciate the beneficial effect of parental warmth than younger children. It also implies that the mechanisms that link

parental warmth and children's psychological well-being may be different at different development stages. From the developmental perspective, children who are among ages 9 to 14 are experiencing the transition from childhood to adolescence. In addition to the comprehensive biological and physical changes to the onset of puberty (Brooks-Gunn & Reiter, 1990; Paikoff & Brooks-Gunn, 1990), the newly found cognitive capacities during this transition period also enable children and adolescents to imagine a range of possibilities and future events (Damon, 1983; Noam, 1999). Such abilities bring great changes in the psychosocial domain, including their understanding of the actual relationships with parents and peers, the developmental sequence of self-awareness, and the friendship framework (e.g., Selman, 1997). While younger children in China tend to expect strict boundaries and rules from parents, it is likely that parents view them as more dependent and vulnerable, and thus are more supportive and allocate them more time and care, especially to the younger ones who experienced more problematic symptoms. On the other hand, older children are finishing their primary school and transiting to junior middle school. As they make this transition, they try to renegotiate the relationships to their parents and experience a striving for independence, autonomy, and a sense of self as psychologically separate from parents (Blos, 1979), yet most of them still rely heavily on their parents for emotional support and personal guidance (Damon, 1983). Thus, parental support and encouragement appear to be more critical to them.

In addition, children with more siblings in the family are more likely to value parental care or warmth when related to their internalizing problems. This is shown in that the same parental warmth reported by children is related to more internalizing problems for only children or children with fewer siblings than for those with more siblings. One possible

reason for this is that, from the “resource dilution” perspective, more siblings in a family may lead the children to compete for the limited “resource” (attention or care) from parents. As a result, parental warmth may appear to be especially a treasure to the child, and thus the same amount of parental warmth means more to a child with more siblings. It may also be that for the only child or a child with fewer siblings, the care and warmth that parents pour turn to be “too much love”, “over-involvement” or “over-protection”, which may spoil the child and make him/her easily upset or unhappy whenever his/her expectation or request cannot be satisfied or immediately satisfied.

School achievement does not matter in the relationship between parental warmth and girls' externalizing behaviors. However, the same parental warmth reported by boys is related to more externalizing symptoms for boys with lower achievement score than for those with higher achievement score. This suggests that school achievement is beneficial to the positive effect of parental warmth on boys' adjustment. The gender differences in this relationship may reflect the different expectations for boys and girls in Chinese culture, especially in poor rural areas. Traditionally, boys are expected to excel through schooling and to be the main support of the family and the “future resource” for their parents while girls in poor rural areas are often expected to excel through marriage and to be good at farming or raising animals, and as a wife.<sup>13</sup> In addition, it is possible that parental warmth has different connotations for boys who did well in schoolwork from those who did poorly. Parental warmth for boys with better achievement may serve as an additional motive for them to focus more on study and thus with less externalizing problems, while the same parental warmth for boys with poor achievement may be a source of worry or anxiety because they feel that they may not live up to their parents' expectations.

However, the above conclusion regarding the effect of parental warmth can only be drawn from children's report data. This study does not show any evidence for such changing relationships between parental warmth and child problems based on the mothers' report. In fact, after considering the effect of parental punishment and other familial variables, parental warmth reported by mothers has no relationship with child internalizing or externalizing problems at all. This may reflect a view among rural mothers that parents always care about their children although they sometimes exercise punitive discipline, the problems in children have nothing to do with parental warmth.

*About the different findings from different data sources*

Not surprisingly, few cross-informant effects are found in this study. In addition, the relationships between parenting and child problems differ by data sources. Several points should be considered when interpreting these differences. First, studies show that a low degree of agreement exists between different informants' reports about individual characteristics and behaviors (e.g., Achenbach, et al. 1987; Anderson, 1998; Wiersen et al. 1988). The different findings from different data sources could partly be explained by the mother-child discrepancy in rating individual characteristics and behaviors. Second, the differences may be due to the different formats of the response. In this study, mothers were interviewed individually and their responses were recorded by interviewers, while children filled out the questionnaire by themselves. Third, it is possible that parents and children used different reference groups or different time frame when responding to the questions regarding parenting and child adjustment. Fourth, related to the third point, although the contents of the measures are the same for mothers and for children, it is possible that discrepancy exists in their understanding of the contents. These possible differences and the

different findings from child data and mother data highlight the importance to use and compare different data sources in future study. However, readers are cautioned not to think that the findings from one data source are superior to the other.

*General discussion of the relationship between parenting and child psychological adjustment*

This study shows the importance of considering the contextual variables when examining the relationships between parental behaviors and child internalizing and externalizing problems. The relations between parenting and child outcomes are not constant; instead, they differ in direction and magnitude depending on child age, gender, school achievement, or sibship size. This implies that when we talk about parenting, it is not enough to just state something like “punitive parenting is bad” or “parental attention is good”. While the findings from this study are informative, caution should be exercised in interpreting the detrimental effect of punitive parenting on child adjustment and the changing relationships between parental warmth and child internalizing or externalizing problems. For example, the relationship tells nothing about causality. Although it is true that parental warmth may constitute a social and emotional resource that allows children to explore their environments and thus may lead to the development of feelings of confidence, trust, and well adjustment in children (Bowlby, 1969), child can also influence their parents’ behaviors through “child effects” (Bell, 1968). Similarly, although parental hostile or punitive behaviors may serve as a model for children (Bandura, 1977), thus predict delinquent or antisocial behaviors in children, a conduct-disordered boy’s noxious behaviors can also lead to negative emotional and behavioral reactions from parents (Anderson, Lytton, & Romney, 1986; Lytton, 1990).

Indeed, investigators increasingly have recognized the importance of the *reciprocal or bi-directional* relationship within families (e.g., Bell & Chapman, 1986; Kuczynski, Marshall, & Schell, 1997; Lollis & Kuczynski, 1997; Lytton, 1990). Children and parents exist in relationship to each other, and thus the feelings and behavior of one affects the other (Belsky, Rha, & Park, 2000; Bronfenbrenner, 1986; Dadds, 1995; Winnicott, 1965; Shek, 2002). From this perspective, the changing relationships between parental warmth and child problems found in this study are not surprising.

In addition to the effect of parental behaviors and their interactions with child age, gender, school achievement, and sibship size, this study also find that mother's education and the other familial contexts such as family wealth, marital relationships, mothers' psychological status, and the interactions among these familial variables are also important in predicting child internalizing and externalizing problems. Limited by the scope of this study, the detail of these effects is left for readers with interest.

#### *Limitations and Future Directions*

When examining the findings from this study, several cautions are worth noting. First, the present study is based on data from the first wave of an ongoing project. The cross-sectional nature of the data limits the ability to examine the causal relation or the changes in the variables. For example, although parenting was used as independent variables in predicting child problems, the relationship between the two constructs may well be reciprocal (e.g., Bell & Chapman, 1986). A child with internalizing problems may get more attention from parents, which in the long-run, may benefit the child. I believe that analyses using longitudinal data will shed light on the reciprocal or bi-directional relationship.

Second, in this study, child school achievement was used as a predictive variable. It may well be that children with more internalizing and externalizing problems will less focus on schoolwork therefore lead to lower test scores. In addition, the way to use standardized math and language (Chinese) test scores as the index of school achievement may also bring potential bias in the estimates of the slope coefficients on achievement.

Third, the reliability for the measure of parental punishment was relatively low (.68 for child, .64 for mother) in this study. I understand that the assessment of parenting behaviors and child psychological well-being in rural China is still evolving and remains a methodological challenge. It is possible that the mothers or children may have interpreted the items used to assess parental behaviors in ways that may not match the researchers' intention.

Fourth, as the first part of a series study, the research design for the current study did not incorporate the community and school level variables. Future study including variables capturing community and/or school characteristics will help understand the dynamic mechanisms that underlie the intertwining parenting-child-outcome relationships. Finally, in addition to the direct effect of parental behaviors on child adjustment, research also documents the mediating role parenting plays in bridging other familial characteristics and child outcomes (e.g., Brody, Flor, & Gibson, 1999; Gutman & Eccles, 1999). The analysis for this study shows that without controlling parental behaviors, family wealth and mothers' psychological well-being were related to child problems reported by children themselves. But these effects failed to show after controlling parenting behaviors. This may suggest that the effect of family wealth or mothers' well-being on children's adjustment is not direct, but

indirect through parenting behaviors. Future study using other analytic method such as structural equation modeling will help explore the mediating effect of parenting.

### *Implications*

Despite the caveats, as one of the first attempts to understand parenting practices and their consequences in a rural setting in China, the findings from this study are significant in that they contribute additional insight to our view of the generalizability and variability that characterizes parenting behaviors, children's developmental trajectories, and their relationships. Especially, the results concerning the changing relationships between parenting and child adjustment illustrate the importance of considering relations among contexts and how the interconnections among the variables and the contexts promote or hinder positive child development (Bronfenbrenner, 1986). In addition, the findings from this study also have policy implications. The differential relationships between parental warmth, parental punishment, and child internalizing and externalizing problems suggest that specific relationships between parenting and child adjustment should be taken into consideration when developing the family-based intervention or prevention programs.

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Article 1 Notes:

<sup>1</sup> Quotations are my translations from the original Chinese.

<sup>2</sup> In 1998, nearly 70% population in China live in rural areas (*China Statistical Yearbook*, 1999). In Gansu, about 76% live in rural areas (*Gansu Socio-economic Development Report*, 2000).

<sup>3</sup> Gansu, a northwest province in China, encompasses 390,000 square kilometers of flat Loess Plateau, Gobi desert, mountainous and hilly areas, and vast grasslands. It has a population of about 25 million (*China Statistic Yearbook*, 1999). The rural residents in Gansu are predominantly employed in subsistence farming or animal husbandry. Like the other interior western provinces in China, Gansu is characterized by prevalent poverty and high rates of illiteracy.

<sup>4</sup> See Appendix C for items of the measures.

<sup>5</sup> In addition to this scale, the children and their mothers answered several other scales.

<sup>6</sup> In this study, parental warmth was measured by 19 items instead of 22 items in a previous study (Liu, 2001); parental punishment was measured by 8 items instead of 10 items in a previous study (Liu, 2001).

<sup>7</sup> Models was run separately for children taking mathematic test and those taking Chinese test, the results show that there is no significant difference in the relationships between parenting behaviors and children's math or Chinese test scores.

<sup>8</sup> In a survey of 2000 children and their families in rural Gansu in the year 2000, 93 percent of the surveyed children had one or more siblings.

<sup>9</sup> Oral consent scripts were used for mothers and children.

<sup>10</sup> Notice however that two observations were intentionally not included in this model, because the result of influential analysis for an initial "final" model which includes all the 1963 observations shows that a couple observations have extreme Cook's D and Hat statistics. The result of sensitivity analysis excluding these two observations from the sample shows that mothers' report of parental warmth and its interaction with spouse caring no longer significantly contribute to the model, which were significant in the initial "final" model.

<sup>11</sup> The variable AGE in the model is centered around the sample mean, which is 11 years old.

<sup>12</sup> The direct comparison of the R-squares between these different models is not appropriate because of the different analytic sample size, however, it can give us a sense of the proportion of the variation in each outcome variable that is explained by the model.

<sup>13</sup> Based on the in-depth interview in rural China.

Running Head: Community Effect

**Communities Influences, Parenting Practices, and Child Adjustment in Rural China:  
A Multi-level Analysis**

### **Abstract**

Theory and research on child development increasingly recognized the importance of the contexts within which individuals are situated. In the past decades, the study of neighborhood or community effects has gained prominence in developmental research. Most existing research, however, were conducted in developed countries; systematic analysis about the impact of communal factors in developing countries is rare. Analyzing data from 2000 children and their families and communities, I examined the community effect on child internalizing and externalizing problems and on the relationships between various parenting practices and child adjustment in rural China. The results from the Hierarchical Linear Modeling (HLM) show that child internalizing and externalizing problems vary across villages in rural China and that the associations between parenting and child psychological adjustment differ from village to village. Children from villages where punitive parenting was popular, on average, reported more internalizing or externalizing problems than did children from villages where punitive parenting was rare. Furthermore, the relationships between individual-level parental punishment and child internalizing or externalizing problems depend on village prevalence of warm parenting. The relation between parental punishment and child externalizing problems was further dependent on the combination of village SES and village culture of warm parenting. Comparably, the associations between parental warmth and child psychological adjustment depend on the combination of village SES and village prevalence of punitive parenting. The findings were discussed in relation to existing theories. Limitations and implications of this study were also addressed.

## **Communities Influences, Parenting Practices, and Child Adjustment in Rural China: A Multi-level Analysis**

### **Introduction**

The recognition of contextual frameworks in developmental psychology, as epitomized in Bronfenbrenner's work (1979, 1986, 1989), has energized interest in contextual effects on child and adolescent development. This perspective of human development highlights the need for researchers to examine the various contexts that influence children and families, as well as the relations among these contexts. As a part of the ecological systems, neighborhood or community is commonly believed to share the responsibilities of influencing social norms, values, behaviors, and child adjustment. In the past decades, the study of neighborhood or community effects has gained prominence in developmental research, especially with respect to child and adolescent school readiness or achievement (Brooks-Gunn, Duncan, Klebanov, & Sealand, 1993; Chase-Lansdale, Gordon, Brooks-Gunn, & Klebanov, 1997; Klebanov, Brooks-Gunn, McCarton, & McCormick, 1998) and behavioral and emotional problems (Brody, Ge, Conger, Gibbons, Murry, Gerrard, & Simons, 2001; Brooks-Gunn et al., 1993; Chase-Lansdale & Gordon, 1996; Chase-Lansdale et al., 1997). Several recent studies have also examined the effect of neighborhood on families (Booth & Crouter, 2001; Brooks-Gunn, Duncan, & Aber, 1997; Burton & Jarrett, 2000; Furstenberg, Cook, Eccles, Elder, & Sameroff, 1998), the relationship between neighborhood conditions and parental behavior (Furstenberg et al., 1998; Jarrett, 1997a; Simons, Johnson, Conger, & Lorenz, 1997), and the extent to which the association between parenting practices and child conduct problems varies by community context (Simons, Lin, Gordon, Brody, & Conger, 2002). However, the majority of the studies of neighborhood effects were conducted in developed countries; systematic analysis about the

impact of communal factors on child and adolescent development and on the association between parenting and child psychological adjustment in developing countries is rare. The current study investigates whether child adjustment varies by community contexts and whether the association between various parenting behaviors and the psychological adjustment of children differs across communities in rural China, where the majority of China's children are raised. My goal is to add a new case to the literature of developmental psychology that focuses on community effects on child development.

An important distinction to make in defining and identifying community dimensions is between the community structure and its social organization (Leventhal & Brooks-Gunn, 2001). The structural aspects of community, as measured by *social address* (Bronfenbrenner, 1986), reflect physical or demographic properties such as community socioeconomic status (SES) or community disadvantage/advantage as indexed by poverty rates, income, percentage of female headship of families, household composition, residential stability, percentage of professionals in the neighborhood, percentage of residents with a high school or college degree, employment or unemployment level, or a combination of these variables (e.g., Brody, et al. 2001; Sampson et al. 1997; Sucoff & Upchurch, 1998). The social organizational aspects of community, as measured by *social capital* (Coleman, 1990, Putnam, 1993), capture residents' evaluations of their social milieu, the informal social control, social cohesion, and social networks, as well as the presence of subcultures with shared social and parental practices and beliefs (e.g., Brody, et al., 2001; Morenoff, Sampson, & Raudenush, 2001; Sampson, Morenoff, & Earls, 1999). Wilson (1991) proposed that each of these aspects of community influences the socialization process for children.

It is well-documented that neighborhood poverty and concentrations of families with lower levels of income are related to higher levels of stress in residents and child maltreatment, and lower levels of parental mental health and child psychological adjustment (Attar, Guerra, Tolan, 1994; Duncan, Brooks-Gunn, & Klebanov, 1994; Lindgren, Harper, & Blackman, 1986; Melton, 1992 ; White, Kasl, Zahner, & Will, 1987). Research consistently reveals the adverse effect of low socioeconomic status<sup>1</sup> in a community on the mental health of children and adolescents (Chase-Lansdale & Gordon, 1996; Duncan & Brooks-Gunn, 1997; Leventhal & Brooks-Gunn, 2001). For example, a majority of the studies of community effects on child and adolescent behavior problems found that the presence of low SES in a community (i.e., poverty, unemployment, male joblessness, and high levels of welfare recipients) was associated with an increase in maternal reports of child externalizing behavior problems (Chase-Lansdale et al., 1997; Duncan et al., 1994), peer-reported aggression (Kupersmidt, Griesler, DeRosier, Patterson, & Davis, 1995), delinquent and criminal behaviors such as truancy, running away from home, or drinking problem (Briggs, 1997; Loeber & Wikstrom, 1993; Peeples & Loeber, 1994), as well as internalizing problems such as anxiety or depression (Simons, Johnson, Beaman, Conger, & Whitbeck, 1996). In addition, high rate of residential instability was found to be associated with juvenile delinquency and crime, particularly property crimes (Sampson & Groves, 1989). Research on the social organizational aspects of community found that community collective socialization processes, such as the willingness of adults in a neighborhood to monitor and supervise the behavior of their children and youths and those of other families, was inversely associated with these children and youths' developmental problems such as deviant peer affiliations (Brody, Ge et al. 2001; Furstenberg, 1993; Sampson & Morenoff, 1997).

Although low SES in a community has been reportedly associated with child developmental problems, this relationship is not universal. For example, research also showed that residing in a neighborhood with more socioeconomic resources was positively associated with increased amounts of reported internalizing problems among young children (Chase-Lansdale & Gordon, 1996; Chase-Lansdale et al., 1997). Kupersmidt et al. (1995) also found that European-American children from low-SES, single-parent families who live in a middle-SES neighborhood were more likely to experience greater peer rejection compared to their peers living in low-SES neighborhoods. These examples illustrate that it is important to examine the effect of community SES in contexts, that is, to look whether the effect of community SES varies depending on other community-level or individual-level variables.

Although it is still unclear how neighborhood disadvantage or social disorganization becomes linked with child development, several empirical studies suggest that neighborhood characteristics are linked to parenting practices, which in turn affects both the prosocial and the problematic adjustment of children (Brooks-Gunn, et al., 1997; Greenberg, Lengua, Coie, & Pinderhughes, 1999; Simons, et al., 1996). For example, lower maternal warmth was found to be related to family residing in poorer neighborhoods (Klebanov, et al., 1997). Several scholars have also suggested that parents who reside in impoverished and dangerous neighborhoods may provide less warmth to their children than parents in more advantaged or safer neighborhoods (Anderson, 1991; Burton, 1990; Furstenberg, 1993; Jarrett, 1997b). For example, Earls, McGuire, and Shay (1994) found that parents who reported living in more dangerous neighborhoods also reported using harsher control and more verbal aggression with their children than did parents residing in less dangerous neighborhoods. In

addition, Simons and colleagues (1996) reported that the negative influence of community disadvantage on adolescent boys' psychological distress was mediated through the quality of parenting, such as the use of warm or harsh discipline. These findings suggest that parenting practices not only are related to communal characteristics but also mediate the effect of communal characteristics on children's psychological adjustment. What's more, studies on community effects found that links between parental practices and adolescents' psychosocial development varied by neighborhood context. For example, Gonzales, Cauce, Friedman, and Mason (1996) found that low parental control was more beneficial to adolescents in low-risk neighborhoods and high parental control had more positive effects for youths in high-risk neighborhoods. The study of Simons and colleagues (2002) also revealed that the magnitude of the effect of parenting on children's conduct problems differed across communities. Specifically, they found that the effect of caretaker control on conduct problems was smaller in a community where deviant behavior was more widespread and that the relationship between the use of corporal punishment and children's conduct problems varied depending upon the prevalence of physical discipline in communities. These findings further suggest that communal characteristics affect children's psychological adjustment, and that particular parenting strategies may also be more effective in some community contexts than others.

### *The Current Study*

In this study, I examined the community effect on child internalizing and externalizing problems and on the association between parenting and child problems. This study examines a sample from rural China, a geographically and culturally different

population. Geographically, this population resides in rural areas in China. The research site, Gansu, is a northwest province in China. It encompasses 390,000 square kilometers of flat Loess Plateau, Gobi desert, mountainous and hilly areas, and vast grasslands. The rural residents in Gansu are predominantly employed in subsistence farming or animal husbandry. Resembling the other interior western provinces in China, Gansu is characterized by prevalent poverty and high rates of illiteracy.

In the existing studies, a neighborhood or community typically has been defined using either administrative boundaries such as census tracts and zip codes or a statistically generated cluster (Brody et al. 2001; Simons et al. 2000). In rural China, the administrative village is often viewed as a community or neighborhood. Thus in the following sections, I use the word “village” with a meaning similar to that of neighborhood or community in the existing studies.

Culturally, there are several aspects that are characteristically different in the villages I study from those in most of the existing studies. First, the majority of the residents in the study areas are farmers or peasants. Although some of the residents (mostly young adults) also seek working opportunity in nearby towns or urban areas (in Chinese, “”, DA GONG), the main job is to work in the farm or on the land. Therefore, unemployment is not an issue in the villages. Second, in China’s rural area (especially in this study area), most of the families reside in the same village for generations. Certain family members may move in or out of the family and the village through study, military service, or marriage, but it is not common for a whole family to move.<sup>2</sup> Therefore, different from communities or neighborhood in the West, residential stability in the villages is much higher and varies little

across the villages included in this study. Third, most families in my study area are headed by both parents. The percentage of female-headed or single-parent families in this study is very low (less than 5% in the whole sample). Therefore, the community variables such as residential stability, female headship, single parent families, and employment rate are not included in this study since they do not vary substantially in this study population.

The outcomes I examined include child internalizing problems and child externalizing problems. Internalizing problems are characterized by the symptoms of withdrawal, anxiety, and depression. Externalizing behaviors include hyperactivity, aggression, and delinquency. Although these constructs were originally used in the area of childhood psychopathology, researchers have also used them as indicators of children's adjustment (e.g., Buysse, 1997).

At individual-level, I focused on the consequences of two dimensions of parental practices, parental warmth and parental punishment, on child outcomes. The first involves the extent to which parents or primary caregivers set behavioral standard, monitor their children's behavior, reinforce successes, care about, and are involved in their children's lives. The second dimension of parenting consists of the frequency to which parents rely upon corporal or verbal punishment when disciplining their child. In order to avoid potential confounds, several other individual-level variables such as child age, gender, and mother's education etc., which were significantly related to child internalizing and externalizing problems in a previous study (Article 1, this thesis), are included in the analyses as controls.

At village-level, the village structural variables examined in this study include village wealth, the proportion of adult population (age 18 and above) in the village who were

illiterate, and the average mothers' education in the village. These variables are used as index of village SES. The village socialization variables examined are village prevalence of warm parenting and the prevalence of punitive parenting.

In summary, in this study, I examined (1) whether village-level SES and village culture of parenting practices affected child internalizing and externalizing problems over and above the effects of child and familial characteristics, and (2) whether the effects of parental warmth and punishment on child internalizing and externalizing problems depended on the village variables, over and beyond the effects of other individual and family variables. Based on the prior studies on community effect, I expected that low village SES and/or high prevalence of punitive parenting in village would be positively related to child problems. In addition, I anticipated that the relationships between parenting and child problems would vary depending on village SES and village culture of parenting.

## Method

### *Data*

The data analyzed in this study came from the Gansu Survey of Children and Families (GSCF). The survey included a primary sample of 2000 children aged 9-13 in 20 rural counties in Gansu, an interior province in Northwest China. In addition, information from five linkable secondary samples of children's mothers, household heads, home-room teachers, school principals, and village leaders was also collected. More details on this data set have been reported in earlier studies (Liu, 2001; Liu, Noam, & Hannum, 2002). Information about child problems and parental practices was collected separately from children and mothers. Given the scope of this study, for child internalizing and externalizing problems and parental practices, I only used the data reported by children. The 2000 children were distributed among 100 villages, with 20 children in each village.<sup>3</sup> Each village has a village leader, who is usually elected by the residents in the village, and a village committee. The residents in a village know each other because it is common that generations of each family live in the same village. In the sampled 100 villages, an average village has 364 households, the median village has a population of about 1430. Among the sample children, about 46% were females in an average village. In an average village, mothers had about 4.1 years of education, and an average family had 2.3 children.

### *Measures*

*Child internalizing problems and externalizing behaviors.* The items for measuring children's psychosocial adjustment were adapted from the internalizing and externalizing scales in the Child Behavior Checklist – CBCL and Youth-Self Report (YSR) (Achenbach, 1991). This study employed a subset of the items in Achenbach's YSR instrument, due to concerns

about time burden for respondent children.<sup>4</sup> The detail of the measure of internalizing and externalizing problems is described in Article 1 (this thesis). The Cronbach alpha for child externalizing problem scale (child reported) is .89, and that for child internalizing problem scale (child reported) is .82.

*Parental warmth and parental punishment.* The measures of parental warmth and punishment are discussed in detail in earlier studies (Article 1, this thesis; Liu et al. 2002). The Cronbach alpha is .78 for parental warmth scale (child reported) and .68 for parental punishment scale (child reported). Similar to previous studies, this study measures parental practices by referring to both parents, without differentiating between maternal and paternal parental behaviors.

Although my focus in this study was on village-level variance in child outcomes and in the relations between parenting and child outcomes, my measurement strategy used individual-level attributes to control for within-village variation in individual-level. Specifically, the within-village model regresses each of the two outcome variables on a core set of individual-level variables that have been shown in prior research to significantly influence the outcome. These individual-level variables include, in addition to parental warmth and punishment, child gender, age, school achievement test score,<sup>5</sup> and other familial variables such as sibship size, mother's education, family wealth, mother's negative feeling, mother's satisfaction to life, and marital relationships. The measures of each of these variables are described in detail in Article 1 (this thesis).

The measures of village-level variables:

*Village prevalence of warm parenting.* As noted above, children reported the extent to which parents showed them care and warmth in a parental warmth scale. Scores on this scale were averaged across children within each village to obtain a measure of the prevalence of warm parenting at village-level. The reliability coefficient<sup>6</sup> for this aggregate scale, assessed by the intraclass correlation, is .53.

*Village prevalence of parental punishment.* Similarly, children reported the extent to which parents utilized physical or verbal punishments to discipline their children in a parental punishment scale. Scores on this scale were averaged across children within each village to obtain a measure of the prevalence of punitive parenting within each of the villages. The reliability coefficient for this aggregate scale, assessed by the intraclass correlation, is .73.

*Village socioeconomic status (SES).* The village structural variables in this study include village wealth, the proportion of adult population (age 18 and above) in the village who were illiterate, and the average mothers' education in the village. Given the possible high correlation among the three variables, a composite of village SES was generated by aggregating the three variables to represent the village socioeconomic status, using the principle component analysis. The reliability coefficient for this measure is .73.

### *Procedure*

The Village Questionnaire was distributed to the village leader or the secretary of village committee by one of our trained interviewers. Informed consent form was completed at the site. Standard instruction was given to the village leader and the questionnaire was left for him/her to fill (with a trained interviewer at the site to answer

possible questions). The procedures for collecting child and family data were described in detail in earlier studies (Article 1, this thesis; Liu et al., 2002).

### *Analytic Plan*

The analytic method in this study is hierarchical linear modeling (HLM) (Bryk & Raudenbush, 1992). A number of different titles are used for this method, e.g., multilevel linear regression (Goldstein, 1995), and mixed-effects or random-effects models. Multilevel models present challenges that may discourage their use in educational studies, the most notable of which involves statistical power because the degrees of freedom for the group-level models are based on the number of groups sampled, not on the number of participants. For example, although the present sample included 2000 children and their families, they resided only in 100 villages. However, multilevel modeling avoids problems arising from the lack of independence and the attenuation of standard errors that occur when children and families living in the same village have identical scores on village variables.

In particular, the multilevel-method is useful in two senses. First, in the data I used, individual participants (children and their families) were nested within villages. The way traditional regression model deals with communal effect is by disaggregating data to individual level, i.e., assigning the community values to each individual (Kaplan, 1998). This approach is not adequate for a proper analysis of the effect of village-level characteristics on child outcomes because children living in the same villages will be influenced by common communal environment and will have the same values on village-level variables. Therefore, the Ordinary Least Square (OLS) regression assumption of *independent* observations is violated, thus leading to biased regression coefficients. Second, the assignment of village-

level variables down to the individual level results in statistical tests that are based on the number of individuals instead of the number of villages. In so doing, the standard errors associated with the tests of the village-level variables may be underestimated (Bryk & Raudenbush, 1989; Tate & Wongbundhit, 1983). Thus, relationships that are affected by contextual variables may not be detectable when studied at the individual level, but strongly present when the influence of shared context is taken into account in a multilevel study.<sup>7</sup> As a consequence, a model including both individual-level and contextual-level variables can be more valid for statistical inference (Bliese & Jex, 1999). Furthermore, multilevel modeling not only provides solutions that enable for simultaneous assessment of contextual and individual influences on individual outcomes (Aber, 1994; Torsheim, 2001), it can also help identify the cross-level interaction (Trickett, Barone, & Bachanan, 1996; Bliese & Jex, 1999), that is, whether the effect of individual-level variables on outcomes is contingent on contextual level factors. Thus it can help answer the question about whether the relationships between parenting behaviors and child psychological adjustment differ across villages.

Several analytic tools are available for the multilevel modeling, for example, MLwiN (Rasbash, Browne, Goldstein, Yang, et al., 2000), HLM (Bryk & Raudenbush, 1992), and SAS proc Mixed (Singer, 1998). In this study, SAS proc Mixed procedure was used to simultaneously estimate within-village and between-village models.

Before detailing the modeling process, I first clarify the centering method I used in this study. Studies of centering in multilevel modeling find that judicious centering of individual-level predictors can enhance the interpretation of results and serve to reduce the correlation between intercept and slope estimates across groups. Although raw metric

scaling and grand mean centering may generate equivalent models (Kreft, Leeuw, & Aiken, 1995), in most cases, grand mean centering is preferred because it provides a “computational advantage” (Kreft et al. 1995; Raudenbush, 1989a) by reducing the correlation between the intercept and slope estimates across groups. This reduction of the covariation between the random intercepts and slopes can help to alleviate potential group-level estimation problems due to multicollinearity (Cronbach, 1987; Hofmann & Gavin, 1998). The other centering method, group mean centering (or centering within context) usually generates non-equivalent models to those generated by either raw metric or grand mean centering. As for which centering method to use in the HLM models, Kreft et al. (1995) argued that “there is no statistically correct choice”, but rather, it is “up to the researcher to decide which model to use, given her philosophy, her knowledge of the data, and her research question” (p. 21). Kreft et al. (1995) considered the group mean centering a better approach if the individual outcome is hypothesized, at least partly, as a community effect. In addition, it is suggested that group mean centering can always produce an unbiased estimate of the within group slope and can help separate out the cross-level interactions from group-level interactions (Hofmann & Gavin, 1998; Raudenbush, 1989b). Given that this study focuses on whether the village variables are related to child problems and whether the associations between parenting and child outcomes vary by the village variables, it is important to obtain an unbiased estimate of the within-group slope and to differentiate between cross-level interactions and group-level interactions. For this purpose, the individual level variables were group mean centered, with exception of gender, which is coded as a dummy variable. For the ease of interpretation, village-level variables were grand mean centered.

I first fitted an unconditional means model to examine whether there was significant variation in child outcomes across villages (see Appendix A for model specification). As suggested by Muthen (1994), the decision to proceed with a multilevel analysis depends, in part, on the extent to which there are substantively large between-group (here between-village) variation in the within-group variables (i.e. child outcomes). My interest is in determining whether the within village relationships (i.e., the within village slopes) between the individual level parental practices and each of the child outcomes vary as a function of the between-village predictors. For this reason, in the next step, by including the individual-level variables in the model and allowing the slopes for parental warmth and parental punishment vary across villages, I tested whether there was significant variation in the slopes of individual-level parenting on each of the two outcomes (see Appendix B for an example of the model specification). I built the multilevel model based on the results of the previous study (Article 1, this thesis) to examine whether the relationships between parenting behaviors and each of the child outcomes vary across villages, after controlling for the other child and familial variables. Finally, by including both individual-level and village-level variables in the model, I tested whether village-level SES, village prevalence of warm parenting, and of punitive parenting, contributed to the variation of child problems across villages and to the different parenting-child-outcome relationships across villages, over and above the contributions of the individual-level variables (see Appendix C for an example of the model specification).

## Results

*Intercorrelations between the outcome variables and the village-level predictor variables and among the village-level predictors.*

Table 1. Correlations between Village-level Outcome Variables and Predictive Variables, and among Village-level Predictive Variables (n=100)

	1	2	3	4	5
1. Child internalizing problems	—				
2. Child externalizing problems	.891***	—			
3. Village prevalence of punitive parenting	.481***	.535***	—		
4. Village prevalence of warm parenting	-.056 <sup>ns</sup>	-.145 <sup>ns</sup>	-.211*	—	
5. Village SES	-.306**	-.294**	-.527***	.278**	—
Village-level reliability	.68	.70	.53	.73	.53
MEAN	39.98	34.42	13.05	41.28	0
STD	3.06	3.58	1.27	1.80	1.39

Note: \*p<.05, \*\*p<.01, \*\*\*p<.001, ns – non-significant.

Table 1 presents the correlation matrix for the study variables at the village-level (see Tables 2 & 3 in Article 1, for the correlations among the variables at individual-level). The table shows that village prevalence of punitive parenting is moderately related to village-level child internalizing problems ( $r=.48$ ,  $p<.001$ ) and externalizing problems ( $r=.53$ ,  $p<.001$ ), indicating that children living in villages with high prevalence of punitive parenting on average reported higher internalizing or externalizing problems. Village-level SES is significantly related to village-level child internalizing problems ( $r=-.31$ ,  $p<.01$ ) and externalizing problems ( $r=-.29$ ,  $p<.01$ ), suggesting that villages with high socioeconomic resources tended to have low level of child problems. In addition, Table 1 reveals that village SES is significantly related to village prevalence of punitive ( $r=-.53$ ,  $p<.001$ ) and warm parenting ( $r=.28$ ,  $p<.01$ ).

*Do child internalizing and externalizing problems vary across villages?*

Table 2. The Estimates from the Fully Unconditional Models for Each Outcome. Estimates Were Obtained Using Proc Mixed (Gansu Survey data, individual n=2000, village n=100).

	Child internalizing problems	Child externalizing problems
<i>Fixed effect (Estimated slope / standard error)</i>		
Intercept – estimated average child outcome score	39.98(.31***)	34.42(.36***)
<i>Random effect (Estimated Variance / Standard error)</i>		
Village level ( $\tau_{00}$ )	6.39(1.34***)	9.05(1.83***)
Individual level ( $\sigma^2$ )	59.54(1.93***)	76.12(2.47***)
Intraclass correlation ( $\tilde{n}$ )	.097	.106
Variance Decomposition (percentage)		
Village level	9.69	10.63
Individual level	90.31	89.37

Note: 1. The number in parenthesis is standard error;  
\*\*\* $p < .001$ .

Table 2 presents the results of the unconditional models for both child internalizing problems and externalizing problems. Although the models contain no predictors, they provide a gauge for decomposing the variance in the outcome variables into individual-level and village-level. The results of this analysis show that the intraclass correlation<sup>8</sup> for child report of internalizing problems is .097, indicating that about 10% of the total variance in child internalizing problems is between-villages, with the remaining 90.3% from individual differences within-villages. The estimated variance of child internalizing problems at village level ( $\tau_{00}$ ) is 6.39. Hypothesis test related to this variance indicate that the variance at village level is significantly different from zero ( $Z = 4.79, p < .001$ ). That is, although the majority of the variance in child internalizing problems is within villages, villages do differ in their average child internalizing problem scores.

The estimated between-village variance for child externalizing behaviors is also significantly different from zero ( $\tau_{00}=9.05$ ,  $p<.001$ ), indicating that in addition to the variation among children within each village ( $\sigma^2 = 76.1$ ,  $p<.001$ ), there is significant between-village variation in child externalizing problems. The intraclass correlation ( $\bar{n}=.106$ ) suggests that there is a fair amount of variation (about 11%) in child externalizing problems that can be attributed to between-village differences. Simply, villages differ in their average child externalizing problems. The village-level proportions of the variance in child internalizing and externalizing problems are similar to those reported in other multilevel investigations of community effects on child outcomes such as school achievement or psychological adjustment (e.g., Elliott, Wilson, Huizinga, Sampson, Elliott, & Rankin, 1996; Sampson et al., 1997; Simons et al. 2002).

*Do the relationships between parenting behaviors and child adjustment vary across villages?*

Based on knowledge from an earlier study using the same data (Article 1, this thesis), my next multilevel models used only the individual-level variables as predictors. This allows me to determine whether the relationships between each of the parenting behaviors and child problems vary across villages after controlling for other individual-level variables. It also provides an opportunity to investigate the extent to which each of the parenting variables is related to the outcomes after between-village variation is partialled out. Table 3 presents the estimates.

Table 3. The Estimates from the Conditional Models which Contains Individual-level Variables for Child Internalizing and Externalizing Problems. Estimates Were Obtained Using Proc Mixed (individual n=2000, village n=100).

	Internalizing Problems	Externalizing Problems
<i>Fixed Effect (Estimated slope / standard error)</i>		
Intercept	40.082(.35***)	34.330(.40***)
Individual Level		
Parental warmth – child report	.009(.04 <sup>ns</sup> )	-.072(.04 <sup>-</sup> )
Parental punishment – child report	.762(.07***)	.900(.07***)
Child age	-.709(.15***)	-1.087(.17***)
Child gender	-.134(.33 <sup>ns</sup> )	.309(.37 <sup>ns</sup> )
Child test score	-.038(.00***)	-.052(.01***)
Number of siblings	.244(.24 <sup>ns</sup> )	.185(.27 <sup>ns</sup> )
Mother's education (years)	-.165(.08*)	.028(.06 <sup>ns</sup> )
Log 2 of family wealth	-.241(.14 <sup>-</sup> )	-.258(.15 <sup>ns</sup> )
Individual Level Interactions		
Parental warmth * Child age	-.049(.03 <sup>-</sup> )	
Parental warmth * Child age * Child gender		-.095(.04*)
Parental warmth * Child gender * Mother's education		-.048(.01**)
Parental warmth * Number of siblings	-.102(.04*)	-.094(.04 <sup>-</sup> )
Parental punishment * Number of siblings	-.169(.08 <sup>-</sup> )	-.169(.09 <sup>-</sup> )
Child gender * Mother's education	.164(.10 <sup>ns</sup> )	
<i>Random Effect (Estimated Variance / Standard error)</i>		
Parental warmth – child report ( $\tau_{11}$ )	.066(.02**)	.046(.02*)
Parental punishment – child report ( $\tau_{22}$ )	.159(.07*)	.201(.08**)
Village level ( $\tau_{00}$ )	6.778(1.30***)	9.654(1.80***)
Individual level ( $\sigma^2$ )	48.074(1.65***)	60.230(2.06***)
% of within village (between-children) variance explained by the individual variables	19.26	20.87

Note: 1. The number in parenthesis is standard error;  
 2. ~p<.10, \*p<.05, \*\*p<.01, \*\*\*p<.001, ns – non-significant.

The results of the random effect in Table 3 show that the variance of the slope coefficient for parental warmth on child internalizing problems is significantly different from zero ( $\tau_{11}$ =.066, p<.01), indicating that the association between this parenting practice and

child internalizing problems is not constant across villages. The variance of the slope for parental punishment on child internalizing problems is .159 which is also significantly different from zero ( $p < .05$ ), suggesting that the relationship between parental punishment and child internalizing problems varies based on village characteristics. This is also true for child externalizing problems (for the slope of parental warmth,  $\tau_{11} = .046$ ,  $p < .05$ ; for parental punishment,  $\tau_{22} = .201$ ,  $p < .01$ ). After including the individual-level variables in the model, the individual-level variance left unexplained is 48.1 for child internalizing problems and 60.2 for child externalizing problems. Compared to the individual-level variances in the unconditional model (Table 2,  $\sigma^2 = 59.5$  for internalizing problems and  $\sigma^2 = 76.1$  for externalizing problems), the inclusion of the individual-level variables and the interactions among them accounts for 19% of the explainable within-village variance in child internalizing problems and about 21% in externalizing problems.<sup>9</sup>

The fixed effects of parenting practices and their interactions with the other individual and familial variables are similar to the findings in Article 1 (this thesis). That is, after partialling out the village-level variance, parental warmth was still related to child internalizing problems and externalizing problems. Furthermore, the relation of parental warmth with child internalizing problems differs by child age and by the number of siblings in the family. In addition, its relation with child externalizing problems varies depending upon sibship size, the combination of child gender and age, and the combination of child gender and mother's education. Parental punishment was also associated with child internalizing and externalizing problems and the associations change depending on the number of siblings in the family. Readers with interest are encouraged to read Article 1 (this thesis) in detail.

*Can village SES and village prevalence of punitive or warm parenting contribute to the predictions of child problems and of the relationships between parenting behaviors and child adjustment across villages?*

The findings that villages differ in their average child internalizing problems and externalizing problems and that the relationships between each of the parenting behaviors and child internalizing and externalizing problems are not constant across villages warranted my next analysis in which both the individual- and village-level variables were included. The analysis also explored the cross-level interactions (i.e. the interactions of individual-level parental warmth and punishment with each of the village-level variables). Thus, the models evaluated both the main effects of the individual- and village-level variables and the extent to which the village-level variables predicted the variation in the slopes for individual-level parental warmth and punishment. Table 4 presents the results derived from this analysis. My following focus is on the fixed effects of village-level variables and of the cross-level interactions.

Table 4. The Estimates from the Conditional Models which Contains Individual-level and Village-level Variables for Child Outcomes. Estimates Were Obtained Using Proc Mixed (individual n=2000, village n=100)

	Internalizing problems	Externalizing problems
<i>Fixed Effect (Estimated slope / standard error)</i>		
Intercept	40.286(.34***)	34.280(.36***)
Individual Level		
Parental warmth – child report	-.020(.04 <sup>ns</sup> )	-.110(.04*)
Parental punishment – child report	.757(.06***)	.950(.07***)
Child age	-.708(.15***)	-1.089(.17***)
Child gender	-.052(.32 <sup>ns</sup> )	.415(.37 <sup>ns</sup> )
Child test score	-.038(.00***)	-.051(.01***)
Number of siblings	.249(.24 <sup>ns</sup> )	.210(.27 <sup>ns</sup> )
Mother's education (years)	-.166(.08*)	.023(.06 <sup>ns</sup> )
Log 2 of family wealth	-.236(.14~)	-.244(.15 <sup>ns</sup> )
Individual Level Interactions		
Parental warmth * Child age	-.048(.02~)	_____
Parental warmth * Child age * Child gender	_____	-.093(.04*)
Parental warmth * Child gender * Mother's education	_____	-.047(.01**)
Parental warmth * Number of siblings	-.093(.04*)	-.088(.04~)
Parental punishment * Number of siblings	-.166(.08~)	_____
Child gender * Mother's education	.165(.10 <sup>ns</sup> )	_____
Village-level		
Village SES	-.276(.23 <sup>ns</sup> )	
Village prevalence of punitive parenting	1.074(.24***)	1.498(.23***)
VillageSES* Village prevalence of punitive parenting	.270(.12*)	_____
Cross-level interaction		
Parental punishment *village prevalence of warm parenting	.105(.03**)	_____
Parental punishment * village prevalence of warm parenting *village SES	_____	-.068(.02*)
Parental warmth * Village prevalence of punitive parenting *village SES	-.038(.01*)	-.043(.01*)
<i>Random Effect (Estimated Variance / Standard error)</i>		
Parental warmth – child report ( $\tau_{11}$ )	.062(.02**)	.043(.02*)
Parental punishment – child report ( $\tau_{22}$ )	.126(.06*)	.151(.07*)
Village level variance ( $\tau_{00}$ )	4.562(1.00***)	6.151(1.31***)
Individual level variance ( $\sigma^2$ )	48.034(1.64***)	60.288(2.06***)
% of the slope variation of parental warmth explained by the village variables	6.06	6.52
% the of slope variation of parental punishment explained by the village variables	20.75	24.88
% of village variance explained by the village variables	28.61	32.03

Note: 1. The number in parenthesis is standard error;

2. ~p<.10, \*p<.05, \*\*p<.01, \*\*\*p<.001, ns – non-significant.

As shown in Table 4, village prevalence of punitive parenting has a significant relationship with, respectively, child internalizing problems ( $r=1.074$ ,  $p<.001$ ) and externalizing problems ( $r=1.498$ ,  $p<.01$ ), over and upon the effects of individual-level variables and the other village-level variable. This indicates that children from villages where punitive parenting is popular, on average, reported more internalizing or externalizing problems than did those from villages where punitive parenting is rare. In addition, the interaction between village prevalence of punitive parenting and village SES is significantly related to child internalizing problems ( $r=.27$ ,  $p<.05$ ). This effect is depicted in Figure 1.

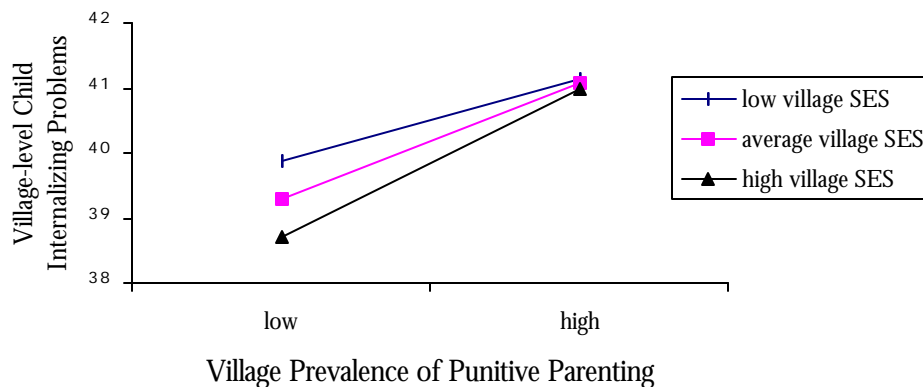


Figure 1. Village-level Child Internalizing Problems as a Function of Village Prevalence of Punitive Parenting and Village SES

The graph shows that overall, higher village prevalence of punitive parenting predicts more village-level child internalizing problems and that higher village SES predicts fewer village-level child internalizing problems. Furthermore, the figure depicts that the magnitude of the effect of village prevalence of punitive parenting on child internalizing problems is larger among villages with higher SES. It also reveals that village SES predicts bigger differences in child internalizing problems among the villages where punitive parenting is less widespread. This pattern of findings suggests that village socioeconomic status and the

norm of punitive parenting together contribute to the prediction of child internalizing problems at the village level. Village SES was significantly related to child externalizing problems in the model without the village prevalence of punitive parenting ( $r = -.76$ ,  $p < .01$ ), indicating that overall children in the villages with lower SES tended to report more externalizing problems. However, village SES is no longer significant in the model with the village prevalence of punitive parenting, which is expected due to the moderately high correlation between these two village-level variables ( $r = -.53$ ).

After controlling for the village-level and individual-level variables in the models, the village-level variance left unexplained is 4.56 for child internalizing problems and 6.15 for externalizing problems. Compared to the village-level variance for child internalizing problems in the unconditional model (Table 2,  $\tau_{00} = 6.39$ ), village prevalence of punitive parenting and village SES together explain 28.6% of the explainable between-village variation in child internalizing problems. Similarly, compared to the village-level variance for child externalizing problems in the unconditional model (Table 2,  $\tau_{00} = 9.05$ ), 32% of the explainable between-village variation in child externalizing problems is explained by village prevalence of punitive parenting.

In addition to the main effects of the two village-level variables, several cross-level interactions are also significant, as presented in the “cross-level interaction” section in Table 4. First, the interaction between parental punishment and village prevalence of warm parenting is significant ( $r = 1.05$ ,  $p < .01$ ) in predicting child internalizing problems, meaning that the effect of parental punishment on child internalizing problems differs depending upon whether parental warmth is prevalent in the village. Figure 2 depicts this effect.

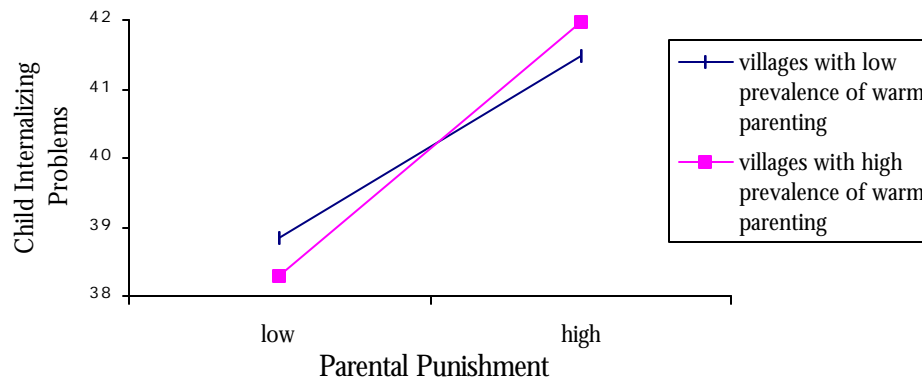


Figure 2. The Association Between Child Internalizing Problems and Parental Punishment as a Function of Village Prevalence of Warm Parenting

As shown in Figure 2, for an average child, the magnitude of the positive relationship between parental punishment and child internalizing problems is larger in villages where warm parenting is more widespread. The second cross-level interaction consists of child reports of parental warmth, village prevalence of punitive parenting, and village SES ( $r = -.038, p < .05$ ). This interaction indicates that for an average child, the relation between parental warmth and child internalizing problems differs depending upon the combination of village prevalence of punitive parenting and village SES. This effect is graphed in Figures 3A and 3B. The figures show a negative relationship between parental warmth and child internalizing problems in villages where village SES and prevalence of punitive parenting are either at a high level (the 3<sup>rd</sup> quartile) or at a low level (the 1<sup>st</sup> quartile). However, among villages with low SES and high prevalence of punitive parenting, or villages with high SES and low prevalence of punitive parenting, the relationship between these two variables is virtually zero.

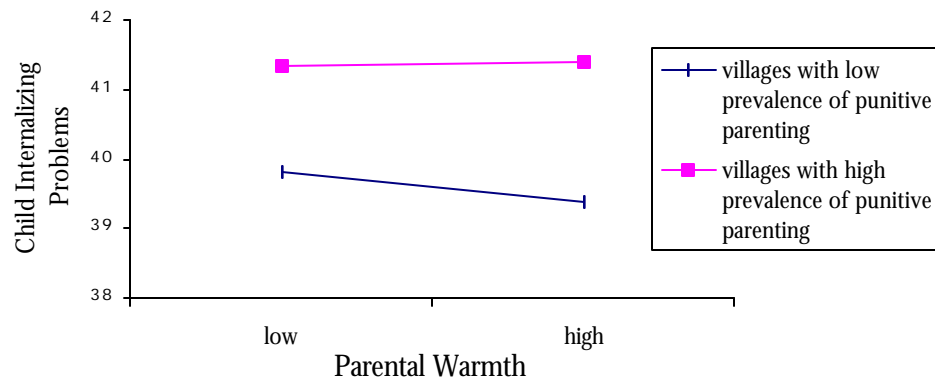


Figure 3A. The Association Between Child Internalizing Problems and Parental Warmth as a Function of Village Prevalence of Punitive Parenting among Low SES Villages

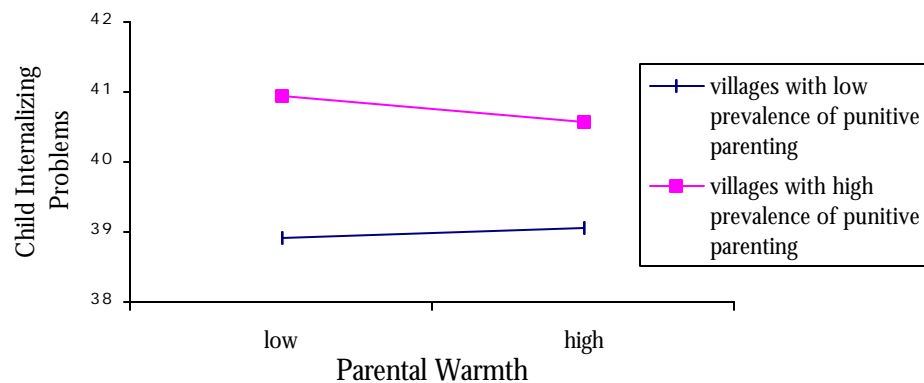


Figure 3B. The Association Between Child Internalizing Problems and Parental Warmth as a Function of Village Prevalence of Punitive Parenting among High SES Villages

For child externalizing problems, two cross-level interactions exist. The first is the interaction among parental punishment, village prevalence of warm parenting, and village SES ( $r = -.068, p < .05$ ), suggesting that the effect of parental punishment on child

externalizing problems depends on the interaction between village prevalence of warm parenting and village SES. Figures 4A and 4B graphically display this effect.

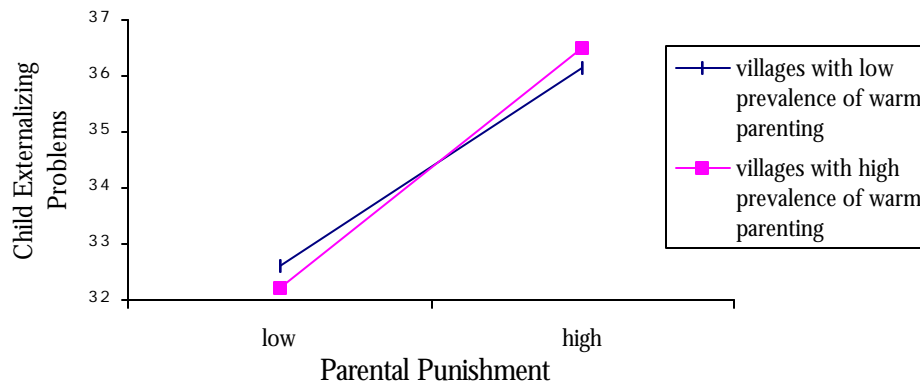


Figure 4A. The Association Between Child Externalizing Problems and Parental Punishment as a Function of Village Prevalence of Warm Parenting among Low SES Villages

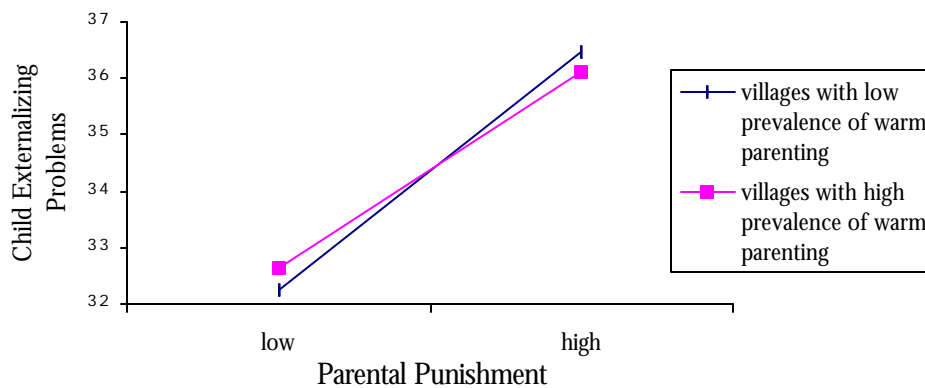


Figure 4B. The Association Between Child Externalizing Problems and Parental Punishment as a Function of Village Prevalence of Warm Parenting among High SES Villages

The graphs in Figures 4A & 4B show a positive relationship between parental punishment and child externalizing problems, regardless of the village prevalence of warm parenting and village SES. However, the magnitude of this relationship is bigger in villages with high SES and low prevalence of warm parenting or those with low SES and high

prevalence of warm parenting than the relationship in villages where village SES and prevalence of warm parenting are both at high levels (3<sup>rd</sup> quartile) or at low levels (1<sup>st</sup> quartile). The second cross-level interaction consists of parental warmth, village prevalence of punitive parenting, and village SES ( $r = -.043$ ,  $p < .05$ ). Figures 5A and 5B graph this effect.

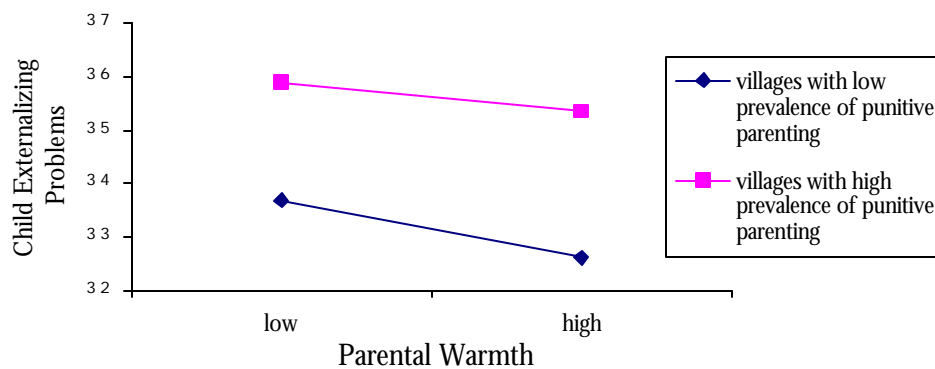


Figure 5A. The Association Between Child Externalizing Problems and Parental Warmth as a Function of Village Prevalence of Punitive Parenting among Low SES Villages

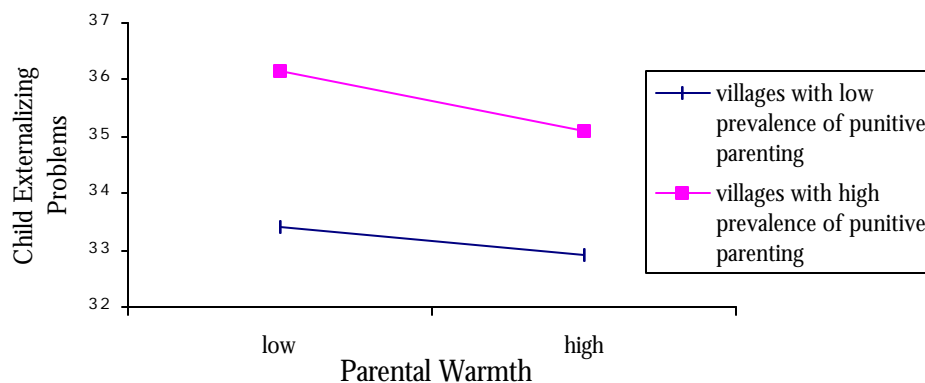


Figure 5B. The Association Between Child Externalizing Problems and Parental Warmth as a Function of Village Prevalence of Punitive Parenting among High SES Villages

The figures show that overall parental warmth is negatively related to child externalizing problems, regardless of the village prevalence of punitive parenting and village SES. However, the magnitude of this relationship is bigger in villages where village SES and the prevalence of punitive parenting are both at high level or at low level than that in villages with low SES and high prevalence of punitive parenting or with high SES and low prevalence of punitive parenting.

## Discussion

My goal in the current study was to investigate whether village characteristics influence child internalizing and externalizing problems and whether the relations between various parenting and child problems vary across villages in rural China. Despite suggestions that multilevel modeling or hierarchical linear models (HLMs) should be used to analyze community level data (Aber, 1994), few studies of populations in the developing countries have done so. Results based on multilevel regression analysis indicated that village prevalence of punitive parenting and village socioeconomic status were linked to children's internalizing and externalizing problems, over and beyond the effects of individual and familial characteristics. In addition, the results revealed that the association between parenting behaviors and child internalizing and externalizing problems differed depending upon village prevalence of punitive or warm parenting and village SES.

### *Children's internalizing and externalizing problems vary across villages*

Ecological theory predicts that child psychological adjustment is not only related to individual and familial characteristics, such as parental behaviors but also to contextual variables such as neighborhood environment. Consistent with this prediction and with the findings reported in literature (e.g., Elliott et al., 1996; Sampson et al., 1997; Simons et al. 2002), this study showed that between-village differences contributed substantially to child internalizing and externalizing problems after child characteristics and familial variables are taken care of. That is, child internalizing problems and externalizing problems do vary across villages. Children in villages where punitive parenting is widespread on average reported more child internalizing and externalizing problems.

Although within-family processes are clearly important, this study shows that village atmosphere of punitive parenting is also important in predicting child maladjustment. If lower prevalence of punitive parenting can be viewed as a component of collective socialization or collective efficacy (Jencks & Mayer, 1990; Leventhal & Brooks-Gunn, 2001), this result adds support to existing research and theory of the collective socialization model, which proposes that neighborhood influences affect children by means of community social organization, including the presence of adult role models, supervision, and monitoring. The contagion model (Jencks & Mayer, 1990) also predicts that the negative behavior of neighbors strongly influences or spreads to the behavior of others. In a village where punitive parenting is widespread, it is not surprising that children may display more problematic behaviors. Caution should be exercised here in that it is not unreasonable to interpret the finding from a different perspective. For example, it is possible that in a community where children display more problematic behaviors, parents or adults on average tend to use harsher discipline in child rearing.

In addition to the main effect of village parenting atmosphere, the interaction between village SES and village prevalence of punitive parenting was also connected to child internalizing problems. Among children living in the villages with higher SES, the link between village prevalence of punitive parenting and child internalizing problems was larger. Although Rutter's (1985) contextual hypothesis conjectured that community processes such as collective socialization had a greater impact on child development in more disadvantaged settings, the finding here suggests that in more advantaged villages (with higher SES) in rural China, punitive parenting is relatively more detrimental to child emotional well-being. Further, the results demonstrate that children residing in a village with lower financial

resources or higher proportions of adults who are illiterate are more likely to experience higher internalizing problems. This is consistent with the neighborhood resource models (Jencks & Mayer, 1990), which posit that neighborhood resources may affect children through access to resources that provide stimulating learning and social environments, such as parks and libraries, as well as community services that promote healthy development. Moreover, the association between village SES and child internalizing problems is larger in the villages where punitive parenting is less popular. This result extends previous findings that the negative influence of community disadvantage on adolescent psychological distress was mediated by the overall quality of parenting, e.g. warmth/support and harsh discipline (Simons et al., 1996). This result also extends previous studies in that it recognizes that the effect of village SES on child problems may depend on other village characteristics. Previous studies on community effect either ignored or did not reveal the interactions among the village-level variables.

*The association between parental behaviors and child internalizing and externalizing problems varies across villages*

The above results indicate that the effect of village-level parenting atmosphere on child psychological adjustment depends in part on other village-level characteristics. Further analyses show that the effects of individual-level parenting behaviors on child problems are also variable depending on village-level characteristics. For an average child, overall, individual-level parental warmth predicted fewer child internalizing and externalizing problems, regardless of village prevalence of punitive parenting and village SES. This finding is consistent with previous study (Article 1, this thesis). However, among children living in disadvantaged villages (where village SES is lower), the magnitude of the effect of

parental warmth on child problems was significantly greater when punitive parenting in the village was less popular; while among children residing in the villages with higher SES, the magnitude of the effect of parental warmth was significantly higher in the villages with high prevalence of punitive parenting.

In a study of the effect that community contexts might have on the relationship between parental control (in the sense of parental care and involvement) and child conduct problems, Simons et al. (2002) identified two hypotheses: the parental buffering hypothesis and the evaporation hypothesis. Applied to this study, the parental buffering theory would predict that the association between parental warmth and child problems should be stronger in a less advantaged neighborhood or a neighborhood with high prevalence of punitive parenting; the evaporation hypothesis would suggest that the effect of parental warmth decrease or “evaporates” as the prevalence of punitive parenting within the community increases. Simons et al.’s (2002) study using an African-American sample supported the evaporation hypothesis in that the effect of caretaker control on child conduct problems was significantly weaker in those areas where the prevalence of deviance was high. The results from this study supported both hypotheses. Among the villages with low SES, the evaporation theory was supported in that parental warmth affected child problems less in the villages where punitive parenting was more widespread. While among the villages with high SES, the buffering hypothesis was supported in that parental warmth affected child problems more in the villages where punitive parenting was more widespread. It is well recognized that it is not just single risk or protective factors but the accumulation of such factors that is likely to result in negative or positive child outcomes (Noam, 1999; Rutter, 1989; Rutter, Champion, Quinton, Maughan, & Pickles, 1995; Sameroff, Seifer, Baldwin, &

Baldwin, 1993; Klebanov et al., 1998). Further, risk and protective factors occur at multiple levels (e.g. individual, family, and community); the effects of the risk and protective factors may vary across subgroups of children or families (Caspi & Moffitt, 1991; Graber & Brooks-Gunn, 1996; Rutter, 1987). If village disadvantage and higher village prevalence of punitive parenting are viewed as two village risk factors affecting child adjustment, the finding suggests that among villages where only one risk dominates, the protective effect of parental warmth is obvious, that is, parental warmth contributes to fewer child internalizing and externalizing problems. On the other hand, among villages where both risks exist, the beneficial effect of parental warmth on child adjustment decreases or evaporates.

The multilevel analysis also indicated that high levels of parental punishment predicted more child internalizing and externalizing problems, regardless of village prevalence of warm parenting and village SES. This is in line with the findings in the literature that a positive association between parental punishment and child internalizing problems (Article 1, this thesis) or externalizing problems (Cohen & Brook, 1994; Deater-Deckard, Dodge, Bates, & Pettit, 1996; Goodman et al., 1998; Straus, Sugarman, & Giles-Sims, 1997).

However, the magnitude of the effect of parental punishment on child internalizing problems was significantly greater in the villages where the prevalence of warm parenting was high. That is, an average child who experienced more parental punishment reported more internalizing problems, but children from villages with higher prevalence of warm parenting reported even higher internalizing problems than did children from villages with lower prevalence of warm parenting. This result supports the “relative deprivation theory” (Jencks & Mayer, 1990) or the “normative parenting” hypothesis (Simons et al. 2002). The

relative deprivation model posits that neighborhood conditions affect individuals by means of their evaluation of their own situation relative to neighbors or peers. Related to the “relative deprivation theory”, the “normative parenting” hypothesis regarding parental punishment emphasizes cultural differences in definitions of normative parenting. It is assumed that children are less likely to respond to punitive parenting with negative self-reflection, hostility, or defiance if they consider such practices to be a “normative” or an appropriate approach to parenting (e.g., Baumrind, 1997; Deater-Deckard & Dodge, 1997). Thus, in villages where warm parenting is common, and therefore normative, children would be expected to view parental punishment as an illegitimate approach to parenting and to respond to this disciplinary strategy with anger, hostility, or self-denigration if they turn it into themselves. In contrast, children residing in villages where warm parenting is less prevalent would not be expected to view parental punishment with a strong adverse response. Thus, it is understandable that parental punishment has a larger effect on child internalizing problems among the villages where warm parenting is more prevalent.

The link between parental punishment and child externalizing problems depends on the combination of village SES and village prevalence of warm parenting. In the disadvantaged villages (villages with lower SES), the magnitude of the link between parental punishment and child externalizing problems is larger when warm parenting in a village is more prevalent. It is not clear why this is so. It may be that in the rural areas where the study was conducted, residents residing in the villages with lower SES may devote less time or resources to the children, and thus children in the villages are less likely to interact with adults other than their own parents in the villages. From this sense, the prevalence of warm parenting is less likely to “spread” to those children whose parents exercise less warmth or

more punishment in their child-rearing practices. As a result, the child would respond to parental punishment with more anger, hostility, or other defiant behaviors.

Among the villages with high SES, however, the magnitude of the effect of parental punishment on child externalizing problems was significantly higher in the villages with lower prevalence of warm parenting than that in the villages with higher prevalence of warm parenting. This different relation may be understood in the framework of “contagion model” (Jencks & Mayer, 1990). Although originally this model focuses on problem behavior and is based on the premise that the negative behavior of neighbors and peers strongly influences or spreads to the behavior of others, it is also possible that the positive behavior of neighbors like parental care or support will influence or spread to others. It may be that in the rural areas, villages with high SES are more likely to enjoy higher social cohesion or collective socialization. Besides the regular communication with their parents, children in these villages may have more opportunities to associate with other adults. Thus, the higher prevalence of warm parenting in the village may result in that an average child in the village is more likely to be affected by the “warm atmosphere” in the village, as if the prevalence of warm parenting “spreads” out to every child. As a result, the effect of parental punishment on child externalizing problems may be lessened in the villages with higher prevalence of warm parenting.

#### *Limitations and Future Directions*

When examining the findings from this study, several cautions are worth noting. First, village socioeconomic status and village culture of parenting clearly can affect children from different ecological niches, but the weight of and mechanism behind the association

may vary. The present study is based on data from one province in western China. It is not known whether the present results can be generalized to other rural populations in China, especially those living closer to urban centers.

Second, theory well recognizes the bi-directional effects and person-context interactions (Bronfenbrenner, 1989) in developmental research. Especially, while contexts influence individuals, individual characteristics often form and influence the contexts in which individuals interact (Aber, Gephart, Brooks-Gunn, Connell, & Spencer, 1997). The cross-sectional nature of the data in this study only allows me to document the existence of the connections without drawing any direction (i.e., causal relations in the variables). I believe that analyses using longitudinal data or using different analytic strategies such as structural equation modeling will help shed light on the causal relationships among the variables.

Third, the unit of community in this study is the administrative village in China. Although geographically differentiated from one another, the villages within the same town or the same county may share certain common characteristics. Future study extending multilevel analyses to the town or county level or to a higher level generated through cluster analysis is possible and may be informative.

Fourth, the reliability for the measure of village prevalence of warm parenting was .53, which is relatively low. This may partly explain why the village prevalence of warm parenting was not related to child internalizing or externalizing problems. In addition, research on community effects has documented that community social environments and community resources matter in child and adolescent development. The data in this study

did not fully capture these components. For example, this study used aggregated family wealth as index of village-level wealth. Future study directly measuring community-level financial status and other variables may provide a clear picture of the village effects in rural China.

Despite the caveats, as one of the first attempts to understand community effects on child development in rural China, this study contributes a new case to the literature about neighborhood effect. The findings provide additional insight to our existed knowledge of the generalizability and variability that characterize community context, its relationship with child adjustment, and its effect on the link between parenting and child psychological well-being. The results strongly suggest that future study should pay close attention to the contextual variables and processes that affect child development.

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Article 2 Notes:

<sup>1</sup>e.g., low neighborhood income, low percentage of professionals in the community, and low percentage of residents with a high school diploma or college degree.

<sup>2</sup> Except for migration related to the “Three-Gorge Project” (“”, SAN XIA GONG CHENG), which, however, does not apply to this study population. A recent phenomenon in China is that if a couple both “” (DA GONG, meaning “work temporarily”) in a nearby town or city, their children may also join them there. Although the family may move to the city, officially they still belong to the rural area they come from, and during the break of the working-season, the whole family usually go back or move back to their villages (“”, REN KOU LIU DONG).

<sup>3</sup> See Appendix B in Article 1 (this thesis) for a description of the sample strategy.

<sup>4</sup> In addition to this scale, the children answered several other scales.

<sup>5</sup> see Article 1 (this thesis) for the rationale to include school performance test in the analysis.

<sup>6</sup> village-level reliability = [village-level variance / (village-level variance + individual-level variance / sample size in the jth village)] / number of villages (based on Raudenbush & Sampson 1999, Sampson et al. 1999).

<sup>7</sup> As a hypothetical example, suppose that the relationship between parental warmth and child depression is a function of community culture of physical punishment. It is possible that the relationship between parental warmth and child depression (at individual-level) can be detected only after taking into consideration the community-level prevalence of punitive parenting.

<sup>8</sup> Estimated intraclass correlation is the proportion of the total variance that can be attributed to the community-level variables.  $\rho = \text{estimated } \tau_{00} / (\text{estimated } \tau_{00} + \text{estimated } \sigma^2)$ .

<sup>9</sup> These explained variances are bigger than the R-squares found in the multiple regression models, where R-square is 16% for child reports of internalizing problems and 19% for child reports of externalizing problems (Article 1).

Running Head: Mediating Role of Parenting

**Socio-economic and Demographic Characteristics and Child Adjustment in Rural  
China: the Mediating Role of Parenting**

### **Abstract**

Research has documented that parenting practices play a mediating role in linking factors such as family economic status, marital relationships, or parental emotional status to the problematic adjustment of children. However, few studies have validated these connections in less developed countries, especially in relatively poor, rural areas of these countries. Using structural equation modeling (SEM) to analyze survey data on 2000 children (ages 9-13) and their families and communities in rural Gansu, China, I hope to address this gap. The results from SEM show that although the direct paths from family wealth, parents' education, mothers' feeling, and marital relationship to child internalizing and externalizing problems are non-significant, each of these constructs has direct impact on parental warmth and parental punishment, which in turn directly influences child internalizing and externalizing problems. Group comparisons by gender and by village group categorized by village SES level were also conducted. No group differences are found in terms of the mediating role of parental behaviors. The results are discussed in the contexts of existing literature and Chinese culture. The results demonstrate the significance of parental behaviors in child development and suggest the possibility and importance of involving parents in the development of appropriate prevention or intervention programs designed to assist children at risk.

## **Socio-economic and Demographic Characteristics and Child Adjustment in Rural China: the Mediating Role of Parenting**

### **Introduction**

It is well documented that parental behaviors and attitudes toward the child have direct and long-term impact on child's psychological adjustment (LeVine, 1988; Whiting & Edwards, 1988). In addition to the direct association between parental practices and child adjustment problems such as incompetent and deviant behavior (Brody, et al., 2001; Cowen, Work, Wyman, Peter, 1997) and depression and anxiety (Cowen, et al., 1997; Eisenberg, et al., 1999; Liu, 2001, Liu et al. 2002; Qian & Xiao, 1998; Rollins & Thomas, 1979), accumulated evidence shows that parenting practices play a mediating role in linking other factors, such as family economic stress, marital relationships, or parental emotional status to both the prosocial and the problematic adjustment and academic performance of children and adolescents (Brody, Flor, & Gibson, 1999; Conger, Conger, & Elder, 1997; Eamon, 2000; Gutman & Eccles, 1999). Indeed, throughout the childhood years, parents play a salient role in children's development by supervising and guiding them (Furstenberg, 1993; Jarrett, 1997a). Parents often play the role of advocates or protectors in their children in their interactions within the family as well as outside the family such as with peers, the school, and other community factors. Thus, parenting is hypothesized to be a key node through which other familial factors are linked to child adjustment. The current investigation was designed to examine this mediational role that parental behaviors play in the context of rural China, with the goal of contributing a new study to the literature highlighting the importance of parenting in child development.

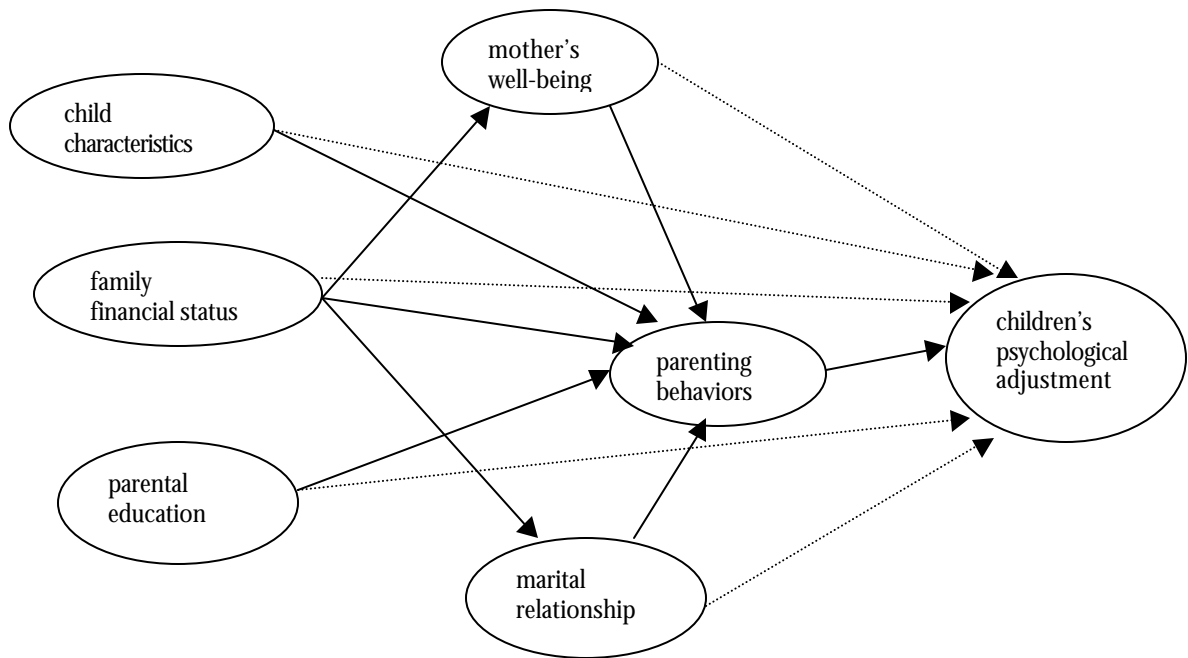


Figure 1. The theoretical frame that will be modeled by using SEM

- Note: 1. Child characteristics include child age, gender, and number of sibling;  
 2. Community characteristics are not included in this frame; their effects will be modeled by multi-group SEM.  
 3. The dotted arrow denotes the possible direct effect of one variable on another variable.

Figure 1 is the theoretical frame depicting the central role of parental behaviors in connecting the effects of other variables on child psychological adjustment. This frame is based on both the conceptual model of Conger and colleagues (Conger et al. 1997; Conger, Conger, Elder, Lorenz, Simons, & Whitbeck, 1993) and the ecological or ecological transactional model (Belsky, 1993; Bronfenbrenner, 1986; Cicchetti & Lynch, 1993). The theoretical model starts with objective, exogenous constructs, including family characteristics such as family financial status, parents' education, and family sibship size and child characteristics such as child age and gender.

Considerable empirical evidence supports the paths denoted in Figure 1. Research concerning the association between financial resources and children's developmental outcomes found that children whose families are in poverty or have experienced chronic financial pressures are more prone to depression and anxiety, or to antisocial behavior (see Samaan, 2000 for a review). A bulk of research also shows that familial economic situation affects children's adjustment indirectly through its negative impact on parents' psychological functioning and capacity for supportive, involved, and consistent parenting (Brody & Flor, 1998; Conger, Conger, Elder, Lorenz, Simons, & Whitbeck, 1992, 1993; Duncan & Brooks-Gunn, 2000; McLoyd, 1998). In addition, family financial status also influences mothers' mood and marital relationship. For example, parents who are poor are likely to be less healthy, both emotionally and physically, than those who are not (Adler, Boyce, Chesney, Folkman, & Syme, 1993). Additionally, poor parental mental health is associated with impaired parent-child interactions (Bradley, 1995). These studies provide a theoretical model describing the mediating role of parenting behaviors in linking economic resources to

children's outcomes. This also follows the theory that stressful family circumstances (especially financial difficulties) have their greatest impact on children and adolescents through their disruption of parental behavior (Patterson, DeBaryshe, & Ramsey, 1989).

Although research has documented the direct path from low education levels among parents to children's overall problem behaviors (Dishion, Patterson, Stoolmiller, & Skinner, 1991), the formal education parents received has been directly linked to responsive and supportive parenting (Brody et al., 1998; Rutter, 1985), which is presumably related to child psychological well being or achievement. These findings suggest that parental education may be related to children's adjustment either directly or indirectly through its effects on parenting practices.

The findings about the effect of family sibship size on children's adjustment are inconsistent (e.g., Buchmann & Hannum, 2001; Hannum, 2002). Several studies have demonstrated that increased numbers of children within the family lead to less favorable child outcomes, such as higher levels of behavior problems (Parcel & Menaghan, 1993) or lower levels of achievement or attainment (Blake, 1989). Others, however, have reported that children reared in a small family tend to have more symptoms of psychopathology (DeAlmeida-Filho, 1984). Explaining this inconsistency requires a better understanding of the mechanism bridging sibship size and child outcomes. For example, women who have to care for several young children in the home may not be fully attentive to all their children. Children in a large family may compete for the limited parenting resources, as suggested by the resource dilution theory (Richter, Richter, Eisemann, & Mau, 1997), and thus experience less parenting attention or more punitive parenting. Moreover, large sibship size in poor families may also negatively impact parents' psychological functioning or marital

relationships because of the large economic and emotional demands from children.

Deteriorations in marital harmony or parents' mood may in turn interfere with effective parenting, which ultimately affects the child's life. This suggests a pathway from sibship size to child outcomes through family processes such as marital relationship and parenting.

Evidence suggests that as a child grows up, parents who exhibit certain parenting behaviors at one point may not do so later on; that is, some parenting practices may fluctuate with the children's age (Juang & Silbereisen, 1999; McNally, Eisenberg, & Harris, 1991; Roberts, Block, & Block, 1984). For example, Conger and Conger (1994) reported that parents tended to be more hostile to older siblings than to younger ones. In addition, older adolescents may be more delinquent than younger ones (Gottfredson & Hirschi, 1990). Given the comprehensive biological and psychological changes accompanying children, especially those ages nine and older who are at the stage of prepuberty or at the onset of puberty (Brooks-Gunn & Reiter, 1990; Holmbeck, Paikoff, Brooks-Gunn, 1995; Paikoff & Brooks-Gunn, 1990), it is valuable to explicitly control for the effect of child age when examining the hypothesized processes.

In addition to the changes attributable to age, gender has also been linked with differences in parenting and children's mental health (Zahn-Waxler, 1993). For example, gender differences were found in reports of internalizing problems (Hankin, Abramson, Moffitt, Silva, McGee, & Angell, 1998) and delinquency (Heimer, 1996) and in the modes of responding to family economic difficulties (Conger, Conger, Elder, Lorenz, Simons, & Whitbeck, 1993; Hops, Sherman, & Biglan, 1990). Research has suggested that rural parents' long-term expectations of economic and emotional support from children differ systematically by gender (Hannum & Kong, 2002), but it is not clear whether these different

expectations translate to different treatment of children in realms such as parenting. This study explicitly controlled for child gender and investigated whether any gender differences existed in the paths.

Examining the theoretical frame (Figure 1) from exogenous constructs to the endogenous constructs of marital relationship and mothers' well-being, research has shown that marital distress or discord and interparental conflicts influenced child adjustment primarily through disruptions in parenting (Conger et al. 1992; Fauber, Forehand, Thomas, & Wierson, 1990; Martin & Clements, 2002; also see Zimet & Jacob, 2001 for a review). Research has shown that mothers' depression is negatively associated with children's adaptive functioning (Gotlib & Goodman, 1999; Gotlib & Lee, 1996) and that mothers who are depressed or dissatisfied with their lives are less likely to interact positively with their children (Baumrind, 1991; Darling & Steinberg, 1993; Rubin, Stewart, & Chen, 1995) or to put much effort into effective parenting practices (Berkowitz, 1989; Downey & Coyne, 1990). Based on the empirical evidence, I expected that mothers' negative mood would have a negative relationship with parental warmth and a positive relation with parental punishment. In addition, marital care was hypothesized to be positively related to parental warmth and negatively associated with punitive parenting.

In the following analyses, I tested the mediating roles of parental behaviors in linking the paths from family characteristics, mothers' mood, and marital relationship, to child internalizing and externalizing problems by using a sample of children aged 9 to 13 years old living in rural China. This research goes well beyond most contemporary studies exploring the effects of parenting and other family processes in that it focuses on the mediational

effect of parenting while tracing the factors that are directly or indirectly linked to child outcomes. In addition, two other features of this study make it unique.

First, this study explicitly compares the intermediate roles of parenting in communities of different socioeconomic levels. Research consistently reveals the adverse effect that low socioeconomic status<sup>1</sup> of communities has on children and adolescents' mental health (Article 2, this thesis; Chase-Lansdale & Gordon, 1996; Duncan & Brooks-Gunn, 1997; Leventhal & Brooks-Gunn, 2001). Although it is still unclear as to how neighborhood disadvantage becomes linked with children's behaviors, several empirical studies suggest that influence of community characteristics on prosocial and maladjustment of children are mediated through the quality of parenting, such as warmth or harsh discipline (Brooks-Gunn, Duncan, & Aber, 1997; Greenberg, Lengua, Coie, & Pinderhughes, 1999; Simons, Johnson, Beaman, Conger, & Whitbeck, 1996). For example, lower maternal warmth was found to be associated with residing in poorer neighborhoods (Klebanov, Brooks-Gunn, Chase-Lansdale, & Gordon, 1997). Furthermore, studies also found that links between parental practices and child problem behaviors and psychosocial development varied by neighborhood characteristics. For example, low parental control was found to be more beneficial to adolescents in low-risk neighborhoods, and high parental control had more positive effects for youth in high-risk neighborhoods (Gonzales, Cauce, Friedman, & Mason, 1996). These findings suggest that it is worthwhile to test whether parenting practice mediates the effect of other family or child characteristics on children's psychological adjustment differently in different communities.

Second, this study used a sample from rural China. Few studies have examined the mediating roles of parenting in less developed countries, especially in the rural areas of these

countries. In spite of the noted economic development in China in the past decade, little is known about how family characteristics such as economic circumstances, marital relationship, and sibship size<sup>2</sup> are related to parenting behaviors and further to child psychological adjustment in China, especially in relatively poor rural areas.

In previous studies (Articles 1 & 2, this thesis), I have examined the direct effect of parenting on child outcomes by controlling for the direct effects of other variables. I have also explored the effects of community variables by using multilevel modeling. Given both the interactive relationships among the variables and the hierarchical nature of the data, this study simultaneously models the relations among the variables related to the characteristics of children and family, and compares the relations between boys and girls, and those among communities with varying SES.

In summary, guided by the theoretical frame (Figure 1), this study focused on three research questions:

1. Do parenting practices play an intermediate role in linking child characteristics and other family characteristics to child adjustment, over and upon the direct effects of these variables?
2. Does this mediating role vary as a function of child gender?
3. Does this mediating role vary by community SES levels?

## Research Design & Methods

### *Data and Sample*

The data for this study are from the data set of the Gansu Survey of Children and Families (GSCF). The GSCF is one of the first large-scale multi-level children's surveys undertaken in developing countries. The principal purpose of this survey is to examine the influence of poverty on the schooling and wealth of children in rural China by incorporating the family, village, and school contexts in which children are educated (Hannum, 1998). This survey was conducted in June 2000. It included a primary sample of 2000 children aged 9-13 in 20 rural counties in Gansu, an interior province in Northwest China. In addition, information from five linkable secondary samples of children's mothers, household heads, home-room teachers, school principals, and village leaders was also collected. Among the 2000 sample children, about 54% are boys. The majority of the sample children (98%) are Han, the major ethnic group in China. About 93% of the children had at least one sibling. No differences are found in the distribution of gender versus age ( $\chi^2=1.01$ ,  $p=.908$ ).

### *Measures*

*Child internalizing problems and externalizing behaviors.* In this study, children's psychological problems were indexed by internalizing and externalizing problems (Cicchetti, & Toth, 1991; Noam, Paget, Valiant, Borst, & Bartok, 1994). Internalizing problems are characterized by the symptoms of withdrawal, anxiety, and depression. Externalizing behaviors include hyperactivity, aggression, and delinquency. The items for measuring children's psychosocial adjustment were adapted from the internalizing and externalizing scales in the Child Behavior Checklist – CBCL and Youth-Self Report (YSR) (Achenbach, 1991). This study employed a subset of the items in Achenbach's YSR instrument, due to

concerns about the time burden for respondent children.<sup>3</sup> The detail of the measures are described in earlier studies (Article 1, this thesis; Liu, 2001; Liu, Noam, & Hannum, 2002). The Cronbach alpha for child externalizing problem scale (child reported) is .89, and that for child internalizing problem scale (child reported) is .82.

*Parental warmth and parental punishment.* Among various aspects of parenting, parental warmth and punishment have received special attention from theorists and researchers (e.g., Chen, Liu, and Li, 2000; MacDonald, 1992; Pettit, Bates, & Dodge, 1997; Qian & Xiao, 1998; Rollins & Thomas, 1979; Russell & Russell, 1996). In this study, parental warmth is measured by high levels of parental support and care, including encouragement, positive reinforcement, active involvement in children's lives, and appropriate monitoring and discipline (Pettit, Bates, & Dodge, 1997). Drawing on the concept of non-supportive parenting behavior defined by Rollins and Thomas (1979), parental punishment is indexed by parental hostility and neglect, harsh discipline, corporal punishment, unresponsiveness, and impatience. The measures of parental warmth and punishment were discussed in detail in earlier studies (Article 1, this thesis; Liu et al. 2002). In this study, the Cronbach alpha for the scale of parental warmth is .78 and for parental punishment is .68. Similar to previous studies, this study measures parental practices by referring to both parents, without differentiating between maternal and paternal parental behaviors.

*Child age and gender, Sibship size, and parents' education.* Information about child age and gender, the number of siblings at a household, and parents' education was provided by children's parents or primary caregivers.

*Family wealth.* Information about family wealth was collected based on the Household Questionnaire which was answered by the father, the mother, or other family head (e.g. grandparents) when parents were not available. The parents or other family head were asked about the value of their house and the values of each of the other family assets such as television, radio, bicycle, furniture, etc. The sum of the values of all the family assets is used as an index of family wealth.

*Mothers' psychological well-being.* In this study, mother's negative feeling was used to represent mothers' psychological well-being. Mothers' response to the statement "I have had bad appetite for a period (in the past month)" based on a 4-point scale (from "strongly disagree" to "strongly agree") was used as an index of mothers' negative feeling. Although literally the item asks about mothers' appetite, a physical symptom, it could be a good proxy for mother's negative affect in the context of poor rural China. According to Kleinman (1986), the somatic symptoms may be the expression of interpersonal and personal distress (e.g., frustration, despair, depression) in an idiom of bodily complaints in Chinese. One possible reason is that, "[F]or most working class Chinese who are used to more concrete modes of expression, conceptualization at the psychic level may seem too abstract" (Kleinman, 1986). It may be that Chinese are less likely to express their depressive feeling in words because the culturally shaped psychological processes lead Chinese to suppress distressing emotions. Another reason is that Chinese culture values the harmony of social relations over the expression of potentially disruptive and ego-centered intrapsychic experience (Shweder & Bourne, 1984). The open verbal expression of personal distress outside close relations is viewed as embarrassing and shameful, and is negatively evaluated

(Kleinman, 1986). Thus, somatization may be a cognitive style of communicating inward feelings in outward somatic responses.

*Marital relationship.* In this study, the quality of the marital relationship was measured by the reported levels of spousal care. The spouse-care scale includes five statements. Mothers responded to each statement on a 3-point Likert scale by indicating the frequency (never, sometimes, often) with which certain things such as “*your spouse easily noticed if you felt unhappy*” take place. The Cronbach alpha for this scale is .79.

*Village SES.* Previous studies have used a combinations of community average per capita income, proportion of working population who are illiterate, and average parental education level to assess community SES (Sampson, Raudenbush, Earls, 1997; Sucoff & Upchurch, 1998). In this study, the combination of these three variables derived from the Village Questionnaire was used as an index of village SES (see Article 2, this thesis) and was used to categorize the villages into three groups: low SES (village SES at the bottom third), middle SES (village SES at the middle third), and high SES (village SES at the top third).

### *Procedure*

To enhance rapport and cultural understanding, graduates from a local university and staff from a local statistics bureau served as home visitors to collect data from the target children, the families, the communities, and the schools. Prior to data collection, the visitors / interviewers received a week of intensive training in how to administer the self-report instruments and to conduct interviews.

Two home visits, each lasting about two hours, were made to each family within one-week period, as the families' schedules allowed. During the first visit, informed consent

forms<sup>4</sup> were completed. The mother or/and father consented to her own and her child's participation in the survey. The mother also provided the name and location of the child's school and authorized the child's teacher to provide the interviewers with information concerning the child's functioning at school. The details of the procedures are described in earlier studies (Article 1, this thesis; Liu, 2001; Liu et al. 2002).

### *Analytic Plan*

The goal of this study is to examine the moderating effect of parenting on the links from children variables and other familial variables to children's internalizing and externalizing behavior problems. To accomplish this, I used structural equation modeling (SEM) as the analytic tool (see Appendix A for a brief discussion of SEM). SEM (Joreskog & Sorbom, 1993a; Rigdon, 1998) not only allows simultaneously modeling of relationships among underlying constructs (latent variables) but also takes into consideration the measurement error. The theoretical frame depicting the impacts of parental behaviors on children's adjustment and the mediating role of parental behaviors in linking the effects of child and other family characteristics on children's adjustment is presented earlier (Figure 1). The endogenous constructs include child internalizing problem ( $\zeta_1$ ), child externalizing problem ( $\zeta_2$ ), parental warmth ( $\zeta_3$ ), parental punishment ( $\zeta_4$ ), mothers' negative feeling ( $\zeta_5$ ), and spousal care ( $\zeta_6$ ); the exogenous constructs are parental education ( $\hat{i}_1$ ), family wealth ( $\hat{i}_2$ ), child age ( $\hat{i}_3$ ), gender ( $\hat{i}_4$ ), and number of siblings in a family ( $\hat{i}_5$ ).

As an example, I show how the SEM can help us know whether parental behaviors play an intermediate role in linking family wealth status to child internalizing problems. Figure 2 is a simplified diagram for answering this question.

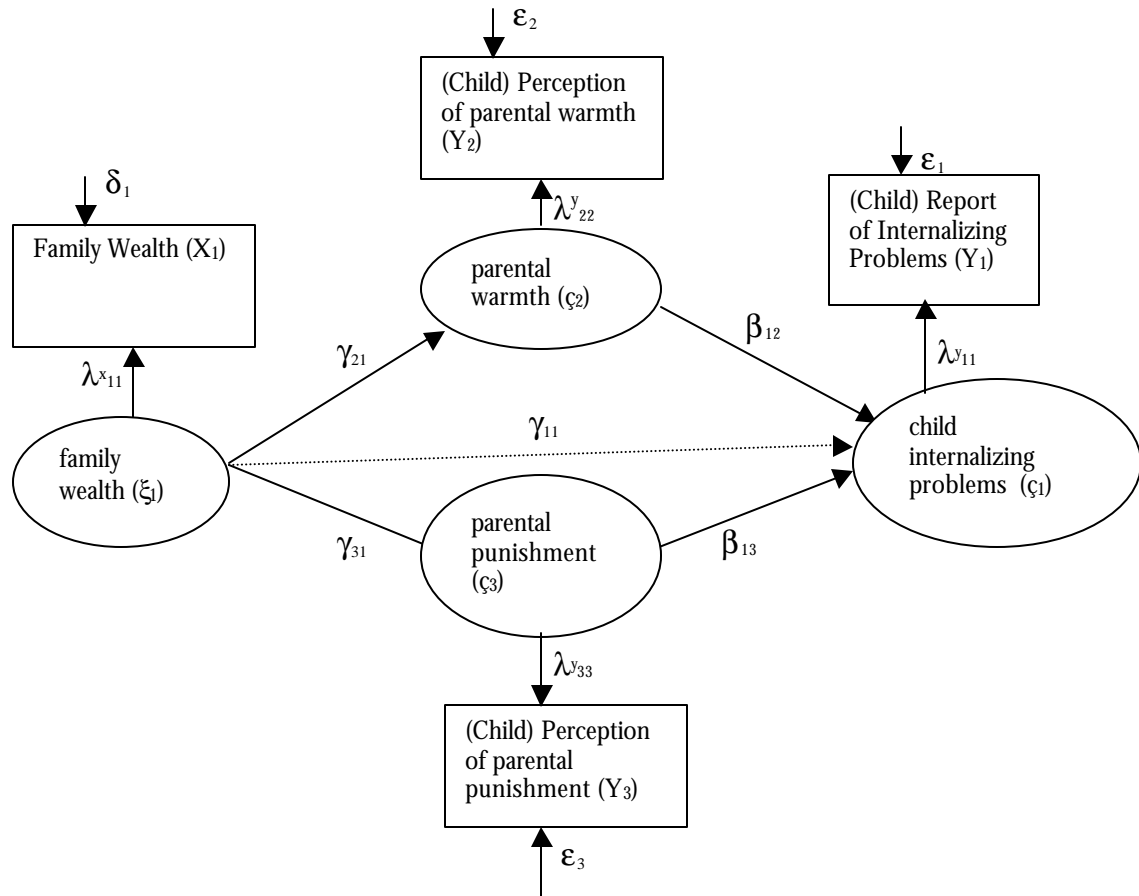


Figure 2. A simplified model to test whether parenting behaviors mediate the effects of family wealth on children's internalizing problems.

The variables in the ovals are the latent variables (denoted as beginning with lower case letters). The variables in the rectangles are the observed variables (denoted as beginning with upper case letters). The  $\zeta$ s are the latent endogenous variables. The  $Y$ s are the observed variables corresponding to the latent endogenous constructs. The  $\hat{\epsilon}$  is the latent exogenous construct, the corresponding  $X$  variable is the observed family wealth.

In Figure 2, the equation for the measurement model of X variable can be written as  $X_1 = \tau_x + \lambda_x \xi_1 + \delta_1$  (Bollen, 1989), where  $X_1$  is the observed family wealth,  $\xi_1$  is the corresponding latent exogenous variable.  $\delta_1$  is the measurement error for  $X_1$ .  $\tau_x$  is the average of the observed family wealth, and  $\lambda_x$  is the factor loading of  $X_1$  on  $\xi_1$ . Similarly, The equation for measurement model of Y variables can be represented as  $Y_p = \tau_y + \lambda_y \eta_p + \varepsilon_p$ .  $Y_p$  is the  $p^{\text{th}}$  observed variable,  $\eta_p$  is the corresponding latent endogenous variable.  $\varepsilon_p$  is the measurement error for the  $p^{\text{th}}$  observed variable.  $\tau_y$  is the average of the  $p^{\text{th}}$  observed variable, and  $\lambda_y$  is the factor loading of Y on  $\eta_p$ . In this study, each latent construct (except parental education) has only one indicator (observed variable), so the factor loading of each observed variable on the corresponding latent construct is set to be one (that is, each  $\lambda$  is 1). By estimating the measurement models, I could explicitly take measurement error into consideration. The measurement error for each measured variable was predetermined based on the reliability of each measure and the variance of each variable.

The equation for the structural model is:  $\eta_q = \beta \eta_q + \gamma \xi_p + \zeta_q$ .  $\eta_q$  is the  $q^{\text{th}}$  latent endogenous construct.  $\xi_p$  is the  $p^{\text{th}}$  latent (exogenous) construct.  $\beta$  is the slope coefficient relating the endogenous constructs.  $\gamma$  is the slope coefficient relating the exogenous construct to the endogenous constructs.  $\zeta_q$  is the error for the endogenous construct that is not explained by the related variables. For example, in Figure 2, the equation for  $\eta_1$  (children's internalizing problem) is:

$$\begin{aligned} \eta_1 \text{ (internalizing problems)} = & \gamma_{11} \xi_1 \text{ (family wealth)} + \hat{\alpha}_{12} \eta_2 \text{ (parental warmth)} \\ & + \hat{\alpha}_{13} \eta_3 \text{ (parental punishment)} + \zeta_1 \end{aligned} \quad (3.1)$$

The equation for  $\eta_2$  (children's perception of parental warmth) is:

$$\eta_2 (\text{parental warmth}) = \gamma_{21} * \xi_1 (\text{family wealth}) + \zeta_4 \quad (3.2)$$

The slope coefficient  $\beta_{12}$  in equation 3.1 tells us whether parental warmth has a direct effect on children's internalizing problems after controlling for other constructs in the equation. The slope coefficient  $\gamma_{11}$  in equation 3.1 tells whether family wealth has a direct effect on children's internalizing problems given the presence of other constructs in the equation. Similarly, the slope coefficient  $\gamma_{21}$  in equation 3.2 tells whether family wealth has a direct effect on parental warmth given the presence of other constructs in the equation. We can know whether family wealth has a direct effect on children's internalizing problems by examining whether  $\gamma_{11}$  in equation 3.1 is significantly different from zero. If the estimation of the models shows that  $\beta_{12}$  in equation 3.1 is significantly different from zero and that  $\gamma_{21}$  in equation 3.2 is also non-zero, we can come to the conclusion that family wealth has a direct impact on parental behaviors which, in turn, exerts an effect on children's internalizing problems; that is, parental behavior plays an intermediate role in linking family wealth to child internalizing problems.

To answer the question of whether this mediating role varies depending upon gender or the community SES, I carried out multi-group analyses by gender (male vs. female) and by village group (low SES, middle SES, and high SES)<sup>5</sup> respectively. By constraining or freeing the  $\gamma$ s and  $\beta$ s in Figure 2 among different groups, the multi-group SEM analysis allows to test whether the mediating roles of parenting behaviors are the same between males and females or in different groups of villages. Figure 2 is a simplified model, which can be easily expanded to include all the child and family variables.

In this study, maximum likelihood estimates of the model coefficients in all the models were obtained using LISREL 8.52 (Joreskog & Sorbom, 2002). Several indices will be used to indicate the extent to which the model fits the data, and each has different properties. The indices include Chi-square, Goodness-of-Fit Index (GFI), stem-and-leaf plot for standardized residuals, and Q-plot (see Appendix B for a description of each of these model-fit indices).

## Results

In this section, I first briefly reported the results of univariate and bivariate analyses, including the group comparison analyses of the variables of interest by child age and gender and by village SES level. I then presented the correlation matrix of the variables. Finally, I detailed the findings from the analyses using SEM.

### *Descriptive Statistics*

Table 1 displays the variable name, description, mean, standard deviation, and the range of the observed variables.<sup>6</sup> The univariate distributions for child internalizing problems and externalizing behaviors were approximately normal. The inspection of bivariate scatterplots did not reveal any curvilinear relationships between observed predictor variables and observed outcome variables (family wealth was log2 transformed). Before beginning the analyses, I performed a number of tests to ensure adherence to the underlying assumption of multivariate normality for structural equation modeling. Measures of multivariate kurtosis and skewness generated by Prelis 2.0 (Jöreskog & Sörbom, 2002) indicated non-significant departures from multivariate normality in the study sample.

Table 1. Descriptions, Means, Standard Deviations, and Ranges of the Variables Analyzed in this Study (n=2000)

Variables Description	Mean (Std. Dev)	Range
children's report of internalizing score	39.98(8.11)	18-72
children's report of externalizing score	34.42(9.22)	18-72
children's report of parental warmth score	41.28(5.65)	19-57
children's report of parental punishment score	13.05(3.13)	8-24
mother's negative feeling	2.22 (0.82)	0-4
marital relation (spouse caring of each other)	11.65(2.24)	5-15
log2 of family wealth	13.23(1.37)	6.85-17.68
children's age	11.03(1.09)	7.67-13.42
children's gender: 1=male, 0=female	0.54 (0.50)	0-1
father's education in years	6.95 (3.54)	0-18
mother's education in years	4.15 (3.52)	0-12
number of children in the family	2.31 (0.72)	1-6

An analysis of variance (ANOVA) using general linear model (GLM) indicates that no gender differences exist in the variables of interest except in children's report of parental warmth ( $F(1,1996)=10.82, p<.01$ ), mothers' report of spouse care ( $F(1,1996)=4.19, p<.05$ ), mothers' education ( $F(1, 1996)=5.45, p<.05$ ), and number of children at family ( $F(1,1996)=60.8, p<.001$ ). On average, boys and girls reported similar symptoms in internalizing or externalizing problems and in parental punishment. In addition, the families of young adolescent boys and girls did not differ on family wealth, fathers' education, and on mothers' negative feeling. However, boys tended to report more parental warmth than girls and families of girls on average had more children than those of boys. In addition, mothers

of boys tended to report more spouse care and had more years of education than those of girls. The results of GLM also showed that differences existed in each of the studied variables (except age and mothers' negative feeling) among villages with varying SES levels. Families in villages with higher SES had, on average, higher fathers' education ( $F(2,1996)=57.1, p<.001$ ) and mothers' education ( $F(2,1996)=228.4, p<.001$ ), fewer children in the family ( $F(2,1996)=24.7, p<.001$ ), and higher family wealth ( $F(2,1996)=152.2, p<.001$ ). Mothers in villages with higher SES also reported higher spouse care ( $F(2,1996)=50.7, p<.001$ ). Children in villages with higher SES reported less parental punishment ( $F(2,1996)=35.6, p<.001$ ) and more parental warmth ( $F(2,1996)=6.58, p<.01$ ), and fewer symptoms in internalizing ( $F(2,1996)=14.0, p<.001$ ) or externalizing problems ( $F(2,1996)=10.8, p<.001$ ) (See Appendix C for details).

### *Correlational Analyses*

Table 2 presents the intercorrelations for all variables used in testing the theoretical model. (The correlation matrices of the variables by gender and by village group are presented in Appendices D-1 & D-2.)

Table 2. Correlation Matrix for the Whole Sample (n=2000)

	1	2	3	4	5	6	7	8	9	10	11	12
1. Child Internalizing Problems												
2. Child Externalizing Problems	.79											
3. Parental Warmth	-.07	-.16										
4. Parental Punishment	.35	.37	-.11									
5. Mothers' negative feeling	.02	-.01	.05	.04								
6. Spousal Care	-.01	-.03	.04	-.02	-.07							
7. Father's Education	-.10	-.10	.06	-.12	.05	.03						
8. Mother's Education	-.09	-.07	.12	-.12	.00	.06	.37					
9. Family Wealth (log <sub>2</sub> )	-.11	-.10	.04	-.15	-.02	.10	.25	.27				
10. Child Age	-.15	-.19	.17	-.16	.04	-.01	.05	.00	.08			
11. Child Gender	.02	.03	.08	.03	-.03	.04	.02	.05	.03	-.01		
12. Number of Siblings	.05	.04	.00	.03	.06	-.09	.03	-.12	-.09	.08	-.18	
MEAN	39.98	34.42	41.28	13.05	2.22	11.65	6.95	4.15	13.23	11.03	.54	2.31
STD	8.11	9.22	5.65	3.13	.82	2.24	3.54	3.52	1.37	1.09	.50	.72

Note:

1. Approximate probability levels for all correlations are as follows (for absolute value):
2.  $r > .037$ ,  $p < .10$ ;  $r > .044$ ,  $p < .05$ ;  $r > .05$ ,  $p < .01$ ; and  $r > .06$ ,  $p < .001$ .

In general, the correlations are in the expected directions and are significant at .05 level. (Given the large sample size, even a small intercorrelation such as .044 is significant at .05 level for the whole sample.) Several clusters of correlations are noticeable from Table 2. First, child internalizing and externalizing problem are highly correlated ( $r=.79$ ,  $p<.001$ ), showing that children who reported higher internalizing problems also had more externalizing behaviors. This is not surprising given the intercorrelated nature of internalizing and externalizing disturbances documented in literature (Garnefski & Diekstra, 1997; Marmorstein & Iacono, 2003; McConaughy & Skiba, 1993; Nottelman & Jensen, 1995). Second, the correlations between child problems and parental punishment are moderately high ( $r=.35$  for internalizing and  $.37$  for externalizing,  $p<.001$ ). In addition, the expected pattern of a small negative correlation was found between child externalizing problem and parental warmth ( $r=-.16$ ,  $p<.001$ ). Third, the correlations among parents' education and family wealth are moderately high (about  $.30$  with  $p<.001$ ). Fourth, the correlation coefficients of age with child problems and parental behaviors range from  $.15$  to  $.19$  (without considering the sign), suggesting that child age may account for the predicted relationship between parental behaviors and child internalizing or externalizing problems and that it is important to control for the possibly confounding effects of age in subsequent analyses. In addition, the number of siblings in a family is negatively related to mothers' education ( $r=-.12$ ) and child gender ( $r=-.18$ ).

#### *The mediating role of parental behaviors*

Structural equation models were used to test whether parental behaviors played an intermediate role in linking child characteristics and other family characteristics to child internalizing and externalizing problems, over and above the direct effects of these variables,

through examining the empirical credibility of the proposed theoretical model (Figure 1).<sup>7</sup> The analyses were first run with the whole sample to explore the overall mediating effect of parental behaviors. Then a group comparison between boys and girls was conducted to examine whether the effect differed by gender. Finally group comparisons among the villages categorized by low (lower 33%), middle (middle 33%), and high (higher 33%) SES were done to test whether the intermediate effects of parental behaviors differed by community SES levels.

### *Overall results*

In order to obtain a parsimoniously fit model, a series nested models were tested for the whole sample. The Goodness-of-Fit indices for comparison of the alternative models are presented in Appendix E-1. The first model in which all the gamma( $\gamma$ s (the paths from each of the exogenous constructs to each of the endogenous constructs) are free to be estimated doesn't fit the data well ( $\chi^2(12)=22.24$ ,  $p=.035$ ). Compared to Model 1 and Model 2 in Appendix E, Model 3, where most of the non-significant  $\gamma$ s and  $\zeta$ s shown in Model 1 or Model 2 were fixed to be zero, fit the data well ( $\chi^2(29)=35.54$ ,  $p=.187$ ), and was a significant improvement over the other models. Conger et al. (1993) reported that the path from parents' depressed mood to marital conflict was significant. To test this possibility, I freed the path from mothers' negative feeling to spouse care in Model 4. Compared to Model 3 where this path is set to be zero, Model 4 does not improve much ( $\chi^2(1)=2.19$ ,  $p>.10$ ), meaning that although spouse care can predict mothers' negative feeling, the path from mothers' negative feeling to spouse care was not significant. Theories, such as Bell's (1968) "child effect theory" and Patterson's (1982) theory of coercive family processes, have

suggested that the behaviors of parents and children influence one another. To test the possible bi-directional influence between parental behaviors and child maladjustment, I relaxed the paths from child internalizing and externalizing problems to parental warmth and punishment (Model 5). Compared to Model 3 in which these paths are restrained to be zero, each of the added paths in Model 5 is non-significant and the model does not improve significantly in terms of model fit ( $\chi^2(4)=4.14, p>.10$ ). This indicates that child maladjustment did not contribute to parental warmth or parental punishment in this study. As a result, Model 3 is the model that best fits the data. The model fit indices include a  $\chi^2[29] = 35.54$  with related  $p=.19$ , a Root Mean Square Error of Approximation (RMSEA)=.01, a goodness-of-fit index (GFI)=.997, and an adjusted goodness-of-fit index (AGFI)=.992. The estimated slope coefficients and standard error showing the intermediate effects of parental behaviors are summarized in Appendix E-2. The standardized solutions resulted from the whole sample were presented in Figures 3a, 3b, and 3c. For the ease of presentation, Figure 3a only shows the direct effects of parental warmth and punishment on child internalizing and externalizing problems (including also the direct effects of child age and the number of siblings on the child problems). Figure 3b presents the direct effects of the exogenous constructs (including parents' education, family wealth, child age, gender, and sibship size) and the other endogenous constructs (including mothers' negative feeling and spousal care) on parental behaviors. The other direct paths from the exogenous constructs to the other endogenous constructs (i.e., mothers' feeling and spousal care) that are significant are depicted in Figure 3c.

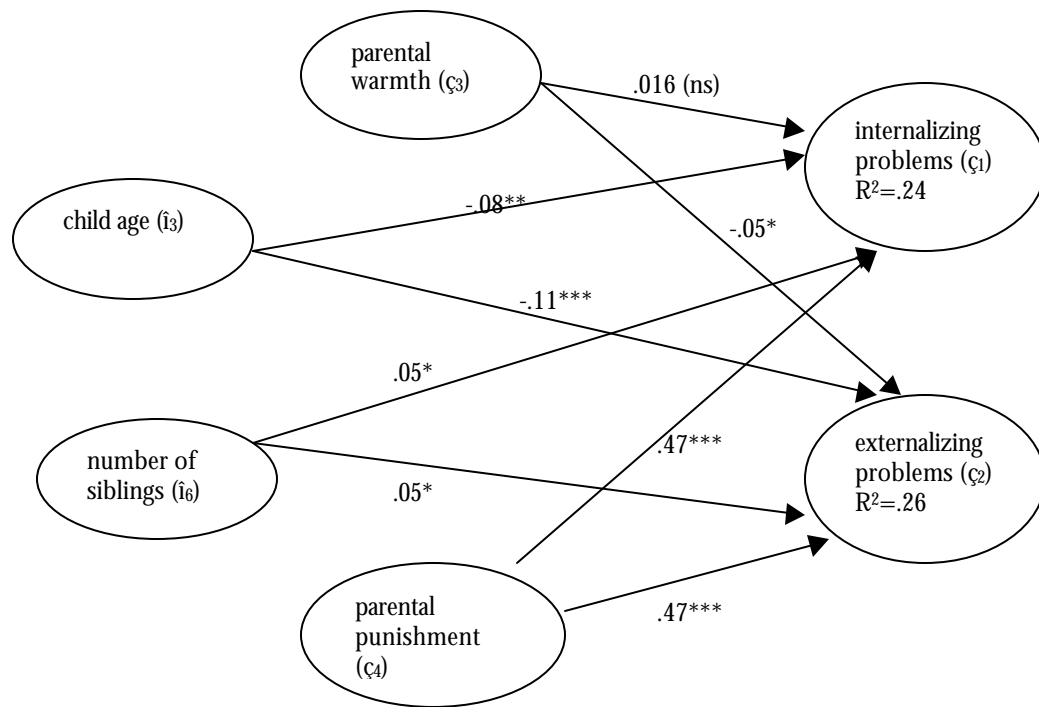


Figure 3a. The direct effects of parental behaviors (including the direct effects of child age and sibship size) on child internalizing and externalizing problems ( $n=2000$ ). The numbers are completely standardized path coefficients. The direct effects of the other constructs on child problems are non-significant, therefore not shown here.

The model fit indexes:  $\chi^2[df=29] = 35.54$ ,  $p=.19$ , RMSEA (Root Mean Square Error of Approximation) = .01; goodness-of-fit index (GFI) = .997; adjusted goodness-of-fit index (AGFI) = .992.

As shown in Figure 3a, parental warmth has direct effect on child externalizing problems ( $\hat{a}_{23} = -.05$ ,  $p < .05$ ). That is, higher parental warmth predicts lower child externalizing problems. Parental punishment also directly affects both child internalizing ( $\hat{a}_{14} = .47$ ,  $p < .001$ ) and externalizing problems ( $\hat{a}_{24} = .47$ ,  $p < .001$ ), indicating that higher parental punishment is related to higher child problems. These findings are consistent with previous studies (Article 1, this thesis). The comparison of the standardized solutions for

the effect of parental warmth and that of parental punishment reveals that the effect size of parental punishment on child problems is much bigger than that of parental warmth. The path from parental warmth to child internalizing problems is non-significant ( $\hat{a}_{13}=.02$ ,  $p>.10$ ). In addition, child age and sibship size are also directly related to child internalizing and externalizing problems. Specifically, older children tended to report lower internalizing ( $\tilde{a}_{13}=-.08$ ,  $p<.01$ ) or externalizing ( $\tilde{a}_{23}=-.11$ ,  $p<.001$ ) problems. Children with more siblings were likely to experience more internalizing or externalizing problems ( $\tilde{a}_{16}=\tilde{a}_{26}=.05$ ,  $p<.05$ ).

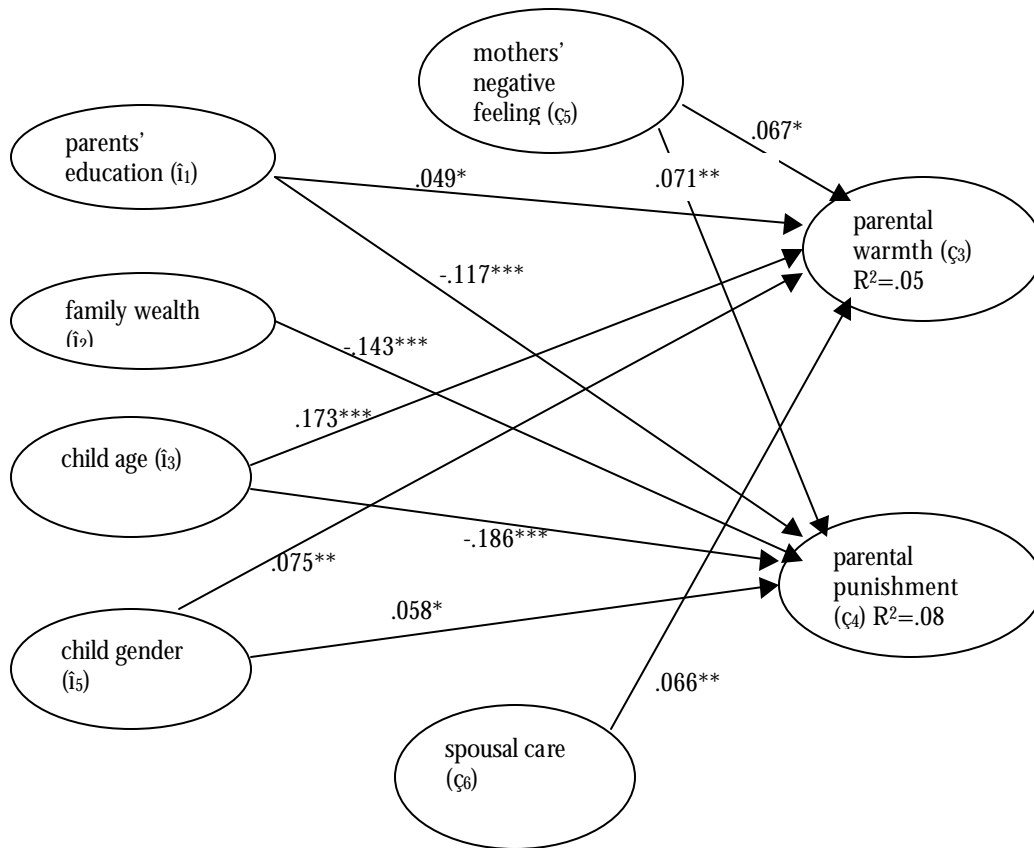


Figure 3b. The direct effects of the constructs on parental warmth and punishment (n=2000). The numbers are completely standardized path coefficients. The direct effects of the other constructs on parental behaviors are non-significant, therefore not shown here.

Although the direct paths from the other endogenous constructs (mothers' feeling and spousal care) and the other exogenous constructs (parents' education, family wealth, and child gender) to child internalizing and externalizing problems are not significant, these constructs are directly related to parental warmth, parental punishment, or both. As shown in Figure 3b, mothers' negative feeling has a positive effect on both parental warmth ( $\hat{\alpha}_{35}=.067$ ,  $p<.01$ ) and parental punishment ( $\hat{\alpha}_{45}=.071$ ,  $p<.01$ ). That is, children whose mothers reported more negative feelings tended to report more punitive parenting. Interestingly, these children also reported more parental warmth. (I speculate why this can be so later.) Spousal care also exerts a positive impact on parental warmth ( $\hat{\alpha}_{36}=.066$ ,  $p<.01$ ), meaning that children whose mothers experienced more spousal care tended to report more parental warmth. In addition, the paths from four of the five exogenous constructs to parental warmth or parental punishment are significant. Specifically, higher parents' education levels are directly related to more parental warmth ( $\tilde{\alpha}_{31}=.049$ ,  $p<.05$ ) and to less parental punishment ( $\tilde{\alpha}_{41}=-.117$ ,  $p<.001$ ); children from wealthier family tended to report less parental punishment than those from less wealth family ( $\tilde{\alpha}_{42}=-.143$ ,  $p<.001$ ); older children reported more parental warmth ( $\tilde{\alpha}_{33}=.173$ ,  $p<.001$ ) and less parental punishment ( $\tilde{\alpha}_{43}=-.186$ ,  $p<.001$ ) than younger children; and boys experienced more parental warmth ( $\tilde{\alpha}_{33}=.075$ ,  $p<.01$ ) and parental punishment ( $\tilde{\alpha}_{33}=.058$ ,  $p<.05$ ) than did girls. To finish the whole picture, the significant paths from the exogenous constructs to mothers' negative feeling and spousal care are presented in Figure 3c.

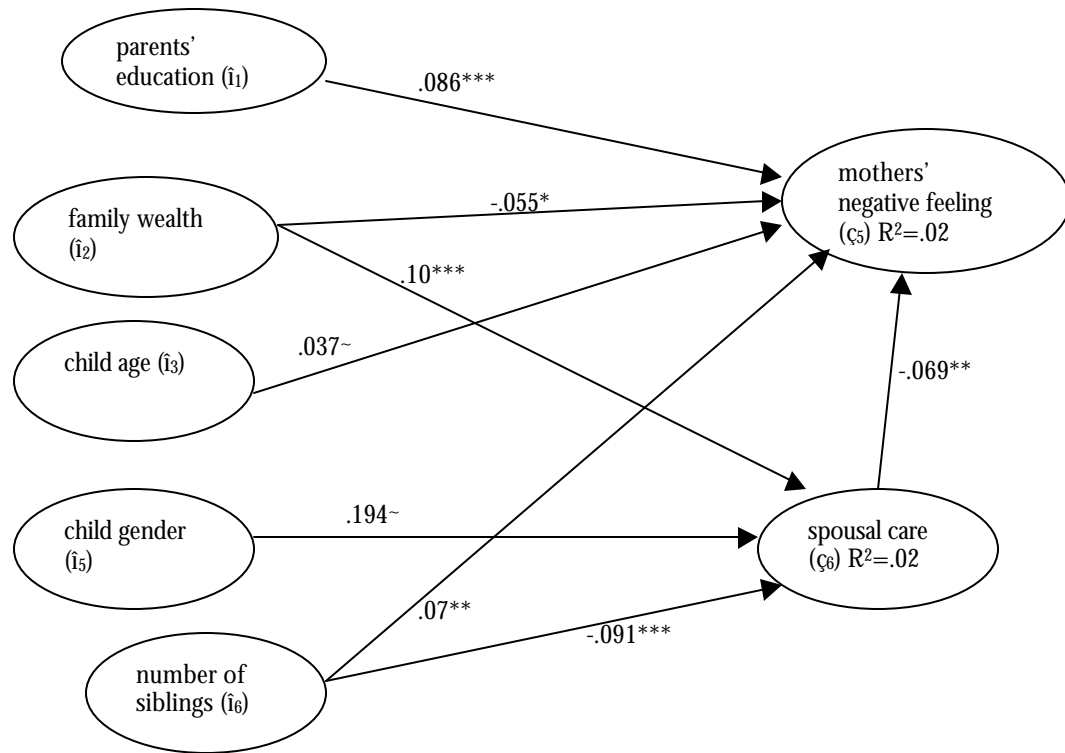


Figure 3c. The direct effects of the constructs on mothers' negative feeling and spousal care (n=2000). The numbers are completely standardized path coefficients. The direct effects of the other constructs on mothers' negative feeling and spousal care are non-significant, therefore not shown here.

From the aforementioned results, it is clear that child age and gender, parents' education, family wealth, mothers' negative feeling, and spousal care, respectively, affect parental warmth and parental punishment (in Figure 3b), which in turn directly impact child internalizing and externalizing problems (in Figure 3a). The significant paths in Figures 3a, 3b, and 3c together demonstrate the mediating effects of parental warmth and parental punishment in linking child characteristics, family SES, and family processes to child psychological adjustment.

*Gender difference (group comparison)*

To test whether the intermediate effects of parental behaviors differ by gender, a series of group comparison models were estimated by splitting the whole sample into two groups: boys and girls. Appendix G-1 presented the Goodness-of-Fit indices for comparison of the alternative models. In Model 5 (Appendix G-1), all the path coefficients were set to be equal between boys and girls except the paths from family wealth to child externalizing problem. Compared to the other alternative models in Appendix G-1, Model 5 best fits the data and is a significant improvement over the other models. In Model 6, I restrained the paths from family wealth to child externalizing problem to be equal. Compared to Model 5, the difference of  $\chi^2$  is significant ( $\chi^2(1)=9.49, p<.01$ ), meaning that the path coefficients from family wealth to child externalizing are different between boys and girls. The model fit indices for Model 5 include a  $\chi^2[67] = 69.92$  with related  $p=.38$ , a RMSEA=.007, and a goodness-of-fit index (GFI)=.993. The common metric of complete standardized solutions are summarized in Table 3.<sup>8</sup> As shown by Table 3, no gender differences are found except in the direct effect of family wealth on child externalizing problems. For boys, family wealth is positively related to externalizing problems ( $\beta_{22|boys}=.045, p<.05$ ); while for girls, family wealth is negatively related to child externalizing problems ( $\beta_{22|girls}=-.038, p<.10$ ).

Table 3. The Common Metric Completely Standardized Solutions Showing the Intermediate Effects of Parental Behaviors (gender comparison, n=1078 for boys, n=922 for girls).

	Beta (direct effect of $\zeta$ on $\zeta$ )		Gamma (direct effect of $\hat{\iota}$ on $\zeta$ )					
	parental warmth ( $\zeta_3$ )	parental punishment ( $\zeta_4$ )	mothers' negative feeling ( $\zeta_5$ )	spousal care ( $\zeta_6$ )	parents' education ( $\hat{\iota}_1$ )	family wealth ( $\hat{\iota}_2$ )	child age ( $\hat{\iota}_3$ )	number of siblings ( $\hat{\iota}_4$ )
Internalizing problems ( $\zeta_1$ )	.016 <sup>ns</sup>	.462***					-.08 ***	.052*
Externalizing problems ( $\zeta_2$ )	-.049~	.465***				.045*(boys) -.038~ (girls)	-.11 ***	.051*
parental warmth ( $\zeta_3$ )			.064**	.068**	.083***	.008 <sup>ns</sup>	.169 ***	
parental punishment ( $\zeta_4$ )			.074**		-.114***	-.146***	-.183 ***	
mothers' negative feeling ( $\zeta_5$ )				-.066**	.06**	-.043~	.041~	.061**
spousal care ( $\zeta_6$ )						.095***		-.078**

Note:

1. The slope coefficients are the same for boys and girls except otherwise noted in the table;
2. ~p<.10, \*p<.05, \*\*p<.01, \*\*\*p<.001, ns – non-significant.

*Village difference (group comparison)*

Previous study (Article 2, this thesis) shows that child psychological adjustment and the relationships between parental behaviors and child adjustment differ depending on village socioeconomic status (SES). To test whether the intermediate effects of parental behaviors differ among different villages categorized by low, median, and high SES, a series of group comparison models were estimated by splitting the whole sample into three groups based on village SES level. Appendix H-1 presented the Goodness-of-Fit indices for comparison of the alternative models. Compared to the other alternative models in Appendix H-1, Model 5 fits the data well and is a significant improvement over the other models. The model fit indices include a  $\chi^2[141] = 157.21$  with related  $p = .166$ , a RMSEA = .013, and a goodness-of-fit index (GFI) = .988. The common metric of complete standardized solutions are summarized in Table 4.<sup>9</sup> As shown in Table 4, most of the path coefficients are the same across the three village groups. However, there are several noticeable group differences. First, the direct effects of family wealth on child internalizing problems and on spousal care are different. Family wealth is negatively related to child internalizing problems in villages with high SES ( $\tilde{a}_{12|high\ SES} = -.065, p < .01$ ), while among villages with low or middle SES, the relation between family wealth and child internalizing problems is not significantly different from zero ( $\tilde{a}_{12|low, mid\ SES} = .017, p > .10$ ). In addition, in villages with mid or high level SES, family wealth is positively related to spousal care ( $\tilde{a}_{62|mid, high\ SES} = .137, p < .001$ ), while in those villages with low SES, the relationship between family wealth and spousal care was non-significant ( $\tilde{a}_{62|low\ SES} = -.07, p > .10$ ).

Table 4. The Common Metric Completely Standardized Solutions Showing the Intermediate Effects of Parental Behaviors (village comparison, n=660 for low SES, n=660 for middle SES, n=680 for high SES)

	Beta (direct effect of $\zeta$ on $\zeta$ )			Gamma (direct effect of $\hat{i}$ on $\zeta$ )					
	parental warmth ( $\zeta_3$ )	parental punishment ( $\zeta_4$ )	mothers' negative feeling ( $\zeta_5$ )	spousal care ( $\zeta_6$ )	parents' education ( $\hat{i}_1$ )	family wealth ( $\hat{i}_2$ )	child age ( $\hat{i}_3$ )	child gender ( $\hat{i}_5$ )	number of siblings ( $\hat{i}_6$ )
internalizing problems ( $\zeta_1$ )	.019 <sup>ns</sup>	.457***				.017 <sup>ns</sup> for low & mid; -.065** for high	-.08**		.045*
externalizing problems ( $\zeta_2$ )	-.048~	.464***					-.111***		.079** for low; .025 <sup>ns</sup> for mid & high
parental warmth ( $\zeta_3$ )			.065**	.056*			.138***	.077**	
parental punishment ( $\zeta_4$ )			.159*** for low & high; -.027 <sup>ns</sup> for mid		-.072**	-.098***	-.189***	.062*	.007 <sup>ns</sup>
mothers' negative feeling ( $\zeta_5$ )				-.07**	.073**	-.068**			.069**
spousal care ( $\zeta_6$ )						-.074 <sup>ns</sup> for low; .137*** for mid & high			-.069**

Note:

1. The slope coefficients are the same for boys and girls except otherwise noted in the table;
2. ~p<.10, \*p<.05, \*\*p<.01, \*\*\*p<.001, ns – non-significant.

Second, the number of siblings is directly positively associated with child externalizing problems in the low SES villages ( $\tilde{a}_{26|low\ SES} = .079, p < .01$ ). This relation was not found in the villages with mid or high SES ( $\tilde{a}_{26|mid, high\ SES} = .025, p > .01$ ), however. Third, the results show that mothers' negative feeling was directly related to parental punishment ( $\hat{a}_{45|low, high\ SES} = .159, p < .001$ ) in villages with low SES or with high SES but not in mid SES villages ( $\hat{a}_{45|mid\ SES} = -.027, p > .01$ ). In addition, the results demonstrate that child age is significantly related to parental warmth among all the villages. However, the effect size of child age on parental warmth in high SES villages ( $\tilde{a}_{33|high\ SES} = .261$ ) is almost twice that in villages with low or mid SES ( $\tilde{a}_{33|low, mid\ SES} = .138$ ).

In spite of these differences, the direct effects of parental warmth and punishment on child internalizing or externalizing problems are constant across the villages grouped based on SES levels. In addition, the mediating roles that parental behaviors play in bridging the other child and family variables and child psychological adjustment are also consistent across the different village groups.

## **Discussion**

My goal in current study was to investigate the mediating roles of parental behaviors in linking child and family characteristics to child internalizing and externalizing problems and to examine whether the roles vary by child gender or across villages in rural China. Results based on the structural equation modeling supported the mediating effects of parental behaviors. In the following discussion, I first brief the direct effect of parental behaviors on child psychological adjustment. Then I describe the intermediate roles of parental behaviors in linking family variables and child characteristics to child outcomes. Finally I discuss the results based on group comparisons. I focus the discussion on the mediating roles of parental warmth or parental punishment.

### *The direct effect of parenting and other factors on child adjustment*

It is well documented that parental behaviors and attitudes toward the child have direct and long-term impacts on child psychological adjustment (LeVine, 1988; Whiting & Edwards, 1988). Substantial evidence has supported the direct association between parental practices and child problems and deviant behavior (Brody, et al., 2001; Cowen et al., 1997) and other adjustment problems such as depression and anxiety (Cowen, et al., 1997; Eisenberg, et al., 1999; Liu, 2001, Liu et al. 2002; Qian & Xiao, 1998; Rollins & Thomas, 1979). Echoing these findings, this study shows that parental warmth and parental punishment, respectively, directly affect child internalizing or externalizing problems. The comparison of the standardized solutions for the effect of parental warmth and that of parental punishment reveals that the effect size of parental punishment on child problems is much bigger than that of parental warmth. In addition, parental warmth affects child

externalizing problems but not internalizing problems. This suggests that punitive parenting is detrimental to child psychological adjustment and that although more parental warmth predicts less child externalizing symptoms, its beneficial effect on child adjustment may be masked by the ill-effects of punitive parenting.

In addition, child age and sibship size are also directly related to child internalizing and externalizing problems. However, the finding that older children tend to report fewer internalizing or externalizing problems is different from the reports in western literature, where older children or adolescents tend to be more delinquent than younger ones (e.g., Gottfredson & Hirschi, 1990). One possible reason is that the social environment in rural areas in China presents less violence and is less complicated in social structure than that in urban settings. Thus children living in the rural areas in China are less likely to be exposed to more complicated or violent environment. In addition, Chinese parents often say that when their children grow up, they “ ” (GENG DONG SHI LE), meaning that they understand more things and have the ability to reason and judge based on moral rules. In addition, from childhood, Chinese are trained to control emotions that are considered adverse and disruptive to harmonious social interaction (Hsu, 1985). It is possible that when children grow up, they tend to report fewer problem behaviors because the culture emphasizes social harmony and personal and familial face (“ ”, MIAN ZI). In considering the effect of sibship size, which was also related to child adjustment, children with more siblings were likely to experience more internalizing or externalizing problems. This may be the result of the children’s competition for the limited resources in the family.

*The mediating effect of parenting behaviors*

Earlier analyses (Article 1, this thesis) based on the data reported by children did not reveal the associations of child problems with mothers' negative feeling, spousal care, and family wealth. As I speculated earlier, these results do not mean that child problems have no relationship at all with family wealth, mothers' mood, or spouse care. Instead, it may be that, although not directly related to child outcomes, these variables indirectly impact child internalizing or externalizing problems through their direct influence on parental behaviors. Following the study of Conger et al. (1993) and Patterson (1991), I hypothesized that family financial circumstances might affect parental mood and marital interactions, which in turn might be directly related to parental warmth, parental punishment, or both. Thus, through the direct links from parental behaviors to child adjustment, these constructs indirectly influence child developmental trajectories. The hypothesis was supported in this study.

For example, although not directly linked to child externalizing problems, family wealth could be indirectly connected to child externalizing problems through parental behaviors. As an example, Appendix F pictures the paths from family wealth to child externalizing problems. First, family wealth is directly related to parental punishment. Second, family wealth directly impacts spousal care, which is in turn related to mothers' negative feeling and to parental warmth. Third, family wealth directly impacts mothers' negative feeling, which in turn has a direct connection with parental warmth and punishment. Finally, parental warmth and punishment, respectively, are directly related to child externalizing problems. The findings suggest that economic difficulties in families exacerbate problems in mothers' mood and in marital care and that these disruptions negatively affect child adjustment through their impacts on parental behaviors.

Although research shows that the path from parents' depressed mood to marital conflict was significant (Conger et al. 1993), this study only supports the path from spousal care to mothers' mood. The reason may be that this study only examined mothers' mood and that the spousal care was measured based on mothers' report. Thus, it is natural that mothers who experienced less spousal care may experience more depressed mood, as shown in this study. Another finding worth noting in this study is that children whose mothers showed "moodiness" tended to report more parental warmth and more parental punishment. It is documented that moodiness in parents may disrupt effective child-rearing behaviors and that parents with depression are less likely to effectively interact with their children (Baumrind, 1991; Darling & Steinberg, 1993; Rubin, et al., 1995). How do we reconcile the finding that mothers' moodiness or signs of depression are related to more parental warmth in this study? It is possible that when depressed mothers realize their situations, they may sympathize with their children and therefore intentionally pay more attention to or care more for their offspring. Related to this, it is also possible that husbands take more responsibility to take care of their children when the mothers are more depressed. Future studies differentiating paternal parenting and maternal parenting will help explore this possibility. However, the finding here indicates that mothers' negative feeling is not necessarily related to less parental warmth, suggesting the possibility of intervention or prevention targeting training effective parenting skills among parents with symptoms of depression.

Parental behaviors not only link family wealth, mothers' feeling, and spousal care to child internalizing or externalizing problems, they also mediate the influences of parents' education, child gender, and child age on child problems. The benefit of parents' education

is that parents with more education are likely to exercise more warm parenting and less punitive parenting.

The finding that boys reported more parental warmth and parental punishment than did girls is not surprising in the rural environment in China. Research suggests that rural parents' long-term expectations of economic and emotional support from children differ systematically by gender (Hannum, 2002). There is a traditional saying in China, “” (YANG ER FANG LAO), meaning that raising a son is for future when one is old. It is possible that the long-term expectations from children, especially from sons, translate to more parental warmth to boys. The same expectations may also be related to more punitive parenting on boys, as implied in the saying “” (BU DA BU CHENG CAI), meaning that punishing<sup>10</sup> children appropriately is a way to make sure their success in the future.

In line with the report that some parenting practices may fluctuate with children's age (Juang & Silbereisen, 1999; McNally, Eisenberg, & Harris, 1991; Roberts, Block, & Block, 1984), this study shows that in rural China, older children tend to perceive more parental warmth and less parental punishment than younger ones. It is possible that when children grow up, parents are less likely to exercise punitive parenting both verbally and physically. In an interview with mothers about their parenting styles, a mother said that “when my child grew up, we (parents) seldom “” (DA, meaning “hit”) him and “” (MA, meaning “criticize”) him because he understands a lot now. After all, he “” (ZHANG DA LE, meaning “he is a big boy now”). The finding that older children tended to report more parental warmth than younger ones may be also related to less parental punishment. As discussed earlier, the detrimental effect of parental punishment on child

development is larger than the protective effect of parental warmth. It is likely that parental punishment is more salient to children. As a result, from the children's perspective, the reduced parental punishment is understood as a symbol of more parental warmth. Therefore, this finding does not necessarily mean that parents provide more care or warmth to older children than to younger ones.

In summary, this study adds evidence to the literature that parenting practices play a mediating role in linking other factors such as family economic stress, marital relationships, or parental emotional status to the psychological adjustment of children (Brody, Flor, & Gibson, 1999; Conger, Conger, & Elder, 1997; Eamon, 2000; Gutman & Eccles, 1999). The fact that only parental behaviors are directly linked to child adjustment (in addition to child age and sibship size) illustrates the key role parents play in their children's development.

Before discussing the group differences, the possible paths from child problems to parental behaviors are worth of attention. Theories, for example, Bell (1968) and Bell and Chapman's (1986) "child effect theory", have suggested that the behaviors of parents and children influence one another and that it is possible that child problems may lead to certain parental behaviors. I tested this possibility but the results do not provide support to the paths from child internalizing and externalizing problems to parental behaviors. Because my analyses were based on cross-sectional data, future study with longitudinal data may better serve the purpose of examining the bi-directional relations.

#### *Gender difference (group comparison)*

Although gender differences were documented in depression, anxiety, and delinquent behaviors in late childhood and adolescence, few studies have examined gender

differences in the pathways from child and family characteristics to child outcomes through parenting practices. This study found little evidence of gender differences in the path coefficients and the findings are consistent with those from the whole sample. One exception is that unlike the analysis using the whole sample, where family wealth only affects child outcomes indirectly, family wealth is directly related to child externalizing behaviors when comparison was made between boys and girls. For boys, the direct link from family wealth to child externalizing problems is positive, while for girls, the direct link is negative. It is not clear why this is so. Possibly boys from wealthier families are more likely to venture out (and thus appear more noisy and naughty) than boys from less wealthy families. However, the indirect effect of family wealth through parenting on child externalizing problems is similar for boys (standardized solution: -.069) and girls (standardized solution: -.071). This further supports the thesis that parental behaviors act importantly in mediating the effect of family wealth (and other family characteristics) on child outcomes.

*Village difference (group comparison)*

Most of the path coefficients are the same across the three village groups and are consistent with those from the whole sample. However, there are several exceptions. First, the direct effect of family wealth on child internalizing problems is different based on village SES. Among villages with high SES, children in wealthier families on average have fewer child internalizing problems; while in villages with low or middle SES, the relation between family wealth and child internalizing problems is not significant. This result supports the “relative deprivation theory” (Jencks & Mayer, 1990) which posits that neighborhood conditions affect individuals by means of their evaluation of their own situation relative to neighbors or peers. It is possible that less wealthy family in a high SES village may evaluate

itself negatively when comparing to those relatively wealthier families. Although the direct effect of family wealth on child internalizing problems varies based on village SES, the indirect effect of family wealth through parenting is similar across villages ( $-.049$  for low SES village,  $-.046$  for mid SES,  $-.048$  for high SES village). This again shows the important mediating effect of parental behaviors. Second, in the villages with low SES, children from families with large sibship size tended to report more externalizing problems. This relation was not found in the villages with mid or high SES, however. This finding supports the resource dilution theory (Richter, et al. 1997). It may be that families in the low SES villages have less resources and therefore more siblings in the family will exacerbate the competition of the limited resources, thus resulting more externalizing problems.

In summary, the results based on the whole sample and on the group comparisons by gender and by village SES groups support the pivotal role parenting practices in influencing child developmental paths. Family characteristics such as parents' education, family wealth, and sibship size, and family environment such as parental mood and marital care impact child indirectly through the child-rearing behaviors of parents. Indeed, parents often act as advocates or protectors for their children's receipt of the influences from other familial conditions and from peers, school, and community resources. Parenting behaviors are a key mirror through which children view their world and view themselves.

#### *Limitations and Future Directions*

There are limitations in generalizability of the findings. First, the current study did not collect data of parenting behaviors separately for mothers and fathers. It is possible that the maternal parenting and paternal parenting may affect child outcomes differently given

the different roles parents are expected in traditional Chinese culture. Given the possible differences between Chinese paternal and maternal roles which are expressed by the popular saying " " (YAN FU CI MU, meaning "strict father and kind mother") and are supported by research (e.g., Shek, 2000), it would be constructive to differentiate between maternal and paternal parenting behaviors for a better understanding of the function of parenting on children's development. Future studies should explore this possibility. Second, previous studies show that parental warmth and punishment influence child internalizing problems differently by child age (e.g., Articles 1 & 2, this thesis). It is likely that the mediating roles of parenting also differ by child age. This possibility will be tested in a separate study. Third, I believe that caring parents will adjust their child-rearing practices according to their children's behaviors. This study did not reveal this "child effect". Future research using longitudinal designs may help investigate these possible influences. Fourth, given the findings in Articles 1 and 2 that the relationships between parenting and child problems are moderated by other variables such as child age and parents' education, it is worth trying to include these moderating effects in structural equation modeling analysis. The results from this study demonstrate the importance of parental behaviors in child development. They suggest the importance of involving parents in the development of prevention and intervention programs designed to assist children at risk.

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Article 3 Notes:

<sup>1</sup> e.g. low neighborhood income, low percentage of professionals in the community, and low percentage of residents with a high school diploma or college degree.

<sup>2</sup> Although the “one child” policy, in a survey of 2000 children and their families in rural Gansu in the year 2000, 93 percent of the surveyed children had one or more siblings.

<sup>3</sup> In addition to this scale, the children answered several other scales.

<sup>4</sup> Oral consent scripts were used for mothers and children.

<sup>5</sup> Kaplan & Elliott (1997) have shown a multilevel SEM method to model variation in the intercepts or means of individual level variables. They noticed that “to date, it is not possible to model variation in the slopes” among individual level variables and thus “they are assumed to be fixed” (p.8). Given the technical difficulty to model slope variation, I examined the community effect on slopes by categorizing villages into three groups and modeling group comparison.

<sup>6</sup> The missing values were imputed by using village mean in this study, so the observation is 2000.

<sup>7</sup> In the actual modeling, several other parameters were set free to be estimated, i.e. were allowed to be co-varied. These parameters are PS(1,2) (the errors of child internalizing and of externalizing), PS(3,4) (the errors of parental warmth and of parental punishment), PH(1,2) (the errors of parental education and of family wealth), PH(1,5) (the errors of parental education and of sibship size), and PH(3,5) (the errors of child age and of sibship size).

<sup>8</sup> The estimated slope coefficients and standard error showing the intermediate effects of parental behaviors are summarized in Appendix G-2.

<sup>9</sup> The estimated slope coefficients and standard error showing the intermediate effects of parental behaviors are summarized in Appendix H-2.

<sup>10</sup> Punishing or “” (GUAN JIAO) in Chinese may convey the meaning of parental involvement in children’s lives (Chao, 1994). Another related saying is “” (it is the father’s fault if he doesn’t “” his children).

## General Conclusion

In this general conclusion, I connect the three articles through an overview of the findings and a reflection on the project of Gansu Survey of Children and Families (GSCF). I also discuss the unexpected or surprising findings. By discussing what I was unable to achieve in this thesis, I suggest possible directions for future investigation.

Family provides the environment in which most of the social/human interactions occur, especially in the first decade of one's life, and parents are the key figures who initiate, moderate, and sustain the interactions and contacts of their young offspring. Many of us cherish those days and nights that parents spend with us. However, not all of the interactions or contacts from parents are a pleasant life gift. For some children, parents are viewed as teachers or role models, who guide them in their course of life. For some others, the way their parents interacted with them during their dependent years may reside in their memory indelibly, occasionally bringing them nightmares or shattering their self-confidence in the face of adversity.

Indeed, families shape the quality of our lives. Emotional and economic links between parents and children and among family members are likely to stretch over a lifespan, influencing one's outlook on life, one's motivation and strategies for achievement, as well as his/her style for coping with unexpected events. Among all the family processes, the way parents interact with their children exerts the most enduring influences on children's lives, especially during the childhood and adolescence years (Lam, Powers, Noam, Hauser, & Jacobson, 1993). No wonder parental behaviors and their influences on child and adolescent development have attracted much attention in both research and practice.

Studies have consistently shown that parental harshness, inconsistent discipline, neglect, or hostility are associated with deviant behavior, with emotional problems such as depression and anxiety, and with other adjustment problems in children (Cowen, Work, Wyman, Peter, 1997; Eisenberg, et al., 1999; Qian & Xiao, 1998). In contrast, many studies have documented that responsive and warm parenting predicts cooperative and affiliative behavior, emotional adjustment, and social and school competence in children (Booth, Rose-Krasnor, McKinnon, & Rubin, 1994; Chen, Liu, & Li, 2000; Qian & Xiao, 1998). Consistent with these findings, longitudinal analyses indicate that children's problem behaviors are associated with earlier experience of harsh parenting (Blanton, Gibbons, Gerrard, Conger, & Smith, 1997; Brody, et al., 2001), low levels of parental monitoring (Walker-Barnes & Mason, 2001), and lower quality of maternal nurturance (Brody et al. 2001). Accumulated evidence also shows that parenting practices play a mediating role in linking other familial factors (e.g., family economic stress, marital relationships, and parental emotional status) to both the prosocial and the problematic adjustment of children and adolescents (Conger, Conger, & Elder, 1997; Eamon, 2000; Gutman & Eccles, 1999).

In this thesis, I examined the importance of parenting behaviors in child development using the data collected in rural China. The data were collected as part of the Gansu Survey of Children and Families in 2000. I participated in the project from the development of and pilot testing of the survey instruments to training interviewers and data collection. The project has collected data from 2000 children (from ages of 9 to 13 years old), their mothers, their households, the villages in which they resided, and the schools they attended. I wanted to examine how different parental practices are related to child maladjustment (indexed by internalizing problems and externalizing behaviors) after child

individual characteristics such as gender and age and family variables such as family wealth, parental education, family size, mothers' well being, and marital relationships are taken into account. I also intended to look at whether and how the parenting-child-development relationship may vary across communities. In addition, I was interested in testing the intermediate role of parenting in bridging the paths from child characteristics and other family variables to child maladjustment. I was also interested in answering whether the mediating role of parenting differs by child gender or across communities.

Taken together, the main findings of the relationship between parenting and child psychological maladjustment reported in literature is supported by this group of studies. In summary, the studies in this thesis find:

- (1) There is a positive relationship between parental punishment and child maladjustment as measured by child internalizing problems and externalizing behaviors. Furthermore, the magnitude of the relationship between parental punishment and child externalizing behaviors reported by children varies depending upon child school achievement and child gender (Article 1).
- (2) The direction and magnitude of the relationship between parental warmth and child maladjustment reported by children differs depending on child age, gender, sibship size, and school achievement (Article 1).
- (3) The relationship between parenting practices and child maladjustment is also different across communities, depending on community SES and community culture of parenting (Article 2).
- (4) Further test of the effects of contextual variables on child outcomes using structural equation modeling shows that only parental warmth and punishment have direct influences on child problems, in addition to the direct links from child age and sibship size to child outcomes. The other socio-economic and demographic variables such as mothers' psychological well-being, marital relationship, family wealth, parents' education, and child age and gender are indirectly connected to child internalizing or externalizing problems through their direct impacts on parental behaviors. That is, parenting practices play mediating roles in bridging the links from socio-economic and demographic characteristics to child adjustment (Article 3).

Several findings are not documented in the existing literature and thus deserve mentioning here. First, although the literature has documented that children whose parents are supportive and encouraging tend to grow up healthier psychologically (e.g., Booth et al., 1994; Chen et al., 2000) and that children who experience low levels of parental care and support are more prone to behavioral and psychological problems (e.g., Eisenberg et al. 1999), the positive relationship between parental warmth and child psychological well-being does not always hold true in this study (Article 1). Instead, the relationships between parental warmth and child internalizing or externalizing problems reported by children are different depending on child's age and the number of siblings. Based on the child report, the same parental warmth perceived by children is associated with more internalizing or externalizing problems in younger children than in older children. This positive relationship between parental warmth and child problems in younger children is unexpected. But it is not surprising when viewed from the "child-effect" or "bi-directional" perspective. I have detailed this point in the discussion section of the first article. It is interesting to note that after the community-level parenting norm was taken into account, the positive association between parental warmth and child internalizing problems among younger children was not that obvious and that the association between parental warmth and child externalizing problems remained negative regardless of child age (Article 2). These findings suggest that it is important to include the community-level parenting norms in the study of family-level parenting behaviors.

Second, the literature has documented the effects of community SES (e.g., community poverty or unemployment rate) and neighborhood social organization or disorganization on child or adolescent psychological adjustment, school achievement, or on

parenting and its relationship with child adjustment. However, the study of the effect of community-level parenting norms on the connections between family-level or individual-level parenting practices and child problems is rare. The results in Article 2 of this thesis show that the relationships between parenting and child problems not only differ by village SES but also vary by the overall village level of punitive parenting or warm parenting. This finding emphasizes the necessity to incorporate community-level parenting practices in the study of parenting-child-adjustment relationship.

The third finding worthy of attention is from the result of path analysis (Article 3). When examining the indirect effect of mothers' mood on child problems through its direct effect on parenting, this study finds that children whose mothers have more depressive symptoms tend to report more parental warmth and more parental punishment. This is not consistent with what has been documented in most of the literature. That is, most existing studies have documented that bad mood in parents may disrupt effective child-rearing behaviors and that parents with depression are less likely to effectively interact with their children (Baumrind, 1991; Darling & Steinberg, 1993; Rubin, Stewart, & Chen, 1995). I discuss how to make sense of this finding in the third article.

A very strong finding as revealed in the studies and as reported in the literature is the positive relationship between parental punishment and child internalizing and externalizing problems. This finding suggests that punitive parenting, coupled with other unfavorable factors such as family poverty or disadvantaged community conditions, may be detrimental to child psychological well-being. Although in this rural population (and else where) many parents still view physical punishment as an effective way to discipline their offspring, as

reflected in the Chinese saying “” (BU DA BU CHENG CAI, similar to the saying “Spare rod, Spoil child”) and thus it is “legitimate” for parents to exercise physical punishment when socializing their offspring, this finding suggests that parents should be cautious when they exercise high levels of physical or verbal punishment to their “” (BU TING HUA DE, meaning “stubborn” or “disobeying”) child, regardless what their motives or purposes are.

In addition, this study shows that parental warmth is not always negatively related to child problems. For example, among younger children with fewer siblings, parental warmth is positively related to child internalizing problems. In addition, among younger boys with lower school achievement, parental warmth is positively associated with child externalizing problems (see Article 1 for detail). The finding of the varying relationships among parental warmth and child internalizing or externalizing problems indicates that although parenting is important to child adjustment, it is not appropriate to only blame parents for their children's problems. Indeed, as indicated by the ecological transactional model (Belsky, 1993; Bronfenbrenner, 1979, 1989; Cicchetti & Lynch, 1993), an individual's ecology is comprised of a number of co-occurring levels, ranging from the individual and family to environmental forces in the school, community, and culture. According to such a perspective, it is the joined forces of these multilevel contributions that exacerbate or decrease the likelihood of psychological adjustment or maladjustment of child development. As revealed in this study, in addition to parenting, child characteristics, familial variables, and community environment all contribute to child internalizing or externalizing problems and to the relationships between parenting and child adjustment. This suggests that parental behaviors and child development are not something that exists in isolation. They exist in contexts, in webs of

individuals, families, communities, schools, and cultures. Therefore, programs targeted at enhancing effective parenting and child adjustment should take into consideration the system of developmental contexts.

Before I discuss some ideas for future study, I would like to describe a phenomenon observed in the process of our data collection. The population in this study resides in rural areas in Gansu province, China. The experience of participating such a study was the first for most of the families I visited, not only for the children, but also for their parents and their schoolteachers. Most of the parents regarded the opportunity of participating in this study as an honor. Some of them expressed their gratitude for being surveyed or visited by the research team. We had small gifts for the families and for the children as a token of appreciation for their participation. Most of the responses from the parents (after we presented the gifts and said thanks for their participation) were something like “You traveled a long way to come here to study our children, to pay attention to our children in such a remote rural area. We are the ones who should say thanks”. These words always moved me. It reminds me of the obligations as a researcher. This study is not only my search for the answers to my research questions; it is also their search for the opportunity to know and to be known. As researchers, we have the responsibility to broaden our search for knowledge of parenting and child development to include those under-studied population, to have their voices and behaviors recorded in the literature.

Next, I discuss some limitations in this study and suggest future directions in the study of parenting and child development in this population.

First, given the nature of human development, it is important to collect longitudinal data when examining the effect of parenting on child/adolescent developmental trajectories.

I believe that not only parental behaviors impact child adjustment; the influences of these critical parenting practices are also shaped by children's behaviors and by how they respond to a specific parenting style. It is possible that different children may solicit different parents' responses, intentionally or unintentionally. That is, parents may not only be the "aggressors" (of their children's malfunctioning), they may also be the "victims" (of their children's behaviors). To test this possible bi-directional effect requires a well-designed longitudinal study and data collection. The Gansu Survey of Children and Families (GSCF) project has been designed as a longitudinal study. The data collected over time will not only help depict the change path of parenting behaviors and child psychological functioning, it will also help uncover the mechanisms behind the intriguing relationships revealed by the analysis of the cross-sectional data. For example, it may help identify the bi-directional relationship between parenting and child outcome.

Second, this study did not provide concurrent validity evidence for the measures. For example, parental warmth and parental punishment were measured solely by children's or mothers' responses to questionnaires. A future study collecting data using direct observation (of family activity) may provide additional data on parenting. However, this could be a big challenge given the remote study areas and the costs of carrying out the research. In addition, future studies including measures tapping both maternal and paternal parenting and other constructs such as sibship relationships and school-level information will help expand the generalizability of the findings.

Third, initially I intended to analyze the data in a way that would test whether the mediating roles of parenting behaviors in linking other variables and child problems vary depending on community variables. I realize that the technique is still evolving and that

currently multilevel structural equation modeling can only model variation in the intercepts or means of individual-level variables. As Kaplan and Elliott (1997) observed, “to date, it is not possible to model variation in the slopes” among individual level variables. This is a methodological challenge. It will be important to pay close attention to the development of possible solutions to this issue. In addition, I did not include the interactions between parenting variables and other individual variables in the analysis using SEM, given that interactions introduced by cross-multiplying raw scores will result in the matrix of covariances being singular (Kline & Dunn, 2000). Kline and Dunn (2000) have recently demonstrated the possibility of handling interaction terms in SEM analysis and more work in this area will be helpful. If possible, future research including the interactions between parenting and other constructs in the SEM analysis will help model the mediating effects of parenting and the moderating effects of the other variables on the relationships between parenting and child problems simultaneously.

Although not directly related to this thesis, I want to mention the possibility to use the bootstrap technique in the study of parenting and child development. Unlike traditional parametric approaches to inference, which require both a distributional assumption of the parameter to be estimated and a readily available method for calculating the parameters of that distribution, the bootstrap allows the researcher to make inferences without making these strong distributional assumptions and without the need for analytic formulas for the sampling distribution’s parameters (Mooney & Duval, 1993). Although the application of this technique to behavioral sciences has been discussed and explored (e.g. Dalglish, 1994; Lunneborg, 1987), not much empirical study using this technique in research on parenting

and child development emerged except in the demonstration of the use of bootstrap or in simulation studies.

Fourth, this study did not account for the genetic-biological factors that may predispose children to certain psychological problems such as depression. From the transactional perspective (Sameroff & Chandler, 1975), to address the diverse influences on child developmental problems, it is necessary to examine the interrelations among dynamic biological, psychological, and social systems. Research has shown that the prevalence of depressive disorders is higher in the relatives of depressed persons or among relatives who are more closely related than in the general population (McGuffin, Katz, Watkins, & Rutherford, 1996; Weissman, Warner, Wickramaratne, Moreau, & Olfson, 1997). In a study examining various biological structures and processes among depressed children and nondepressed controls, using magnetic resonance imaging (MRI), Steingard et al. (1996) found that, compared to a group of psychiatrically hospitalized nondepressed children, hospitalized children with depressive disorder presented decreased brain frontal-lobe volume and increased lateral ventricular volume. These studies suggest that it is necessary in future research to consider the impact of genetic-biological factors, in concert with the influences of individual and contextual factors, on the developmental trajectories of children and adolescents.

Finally, as a large-scale survey, the GSCF project has established a good database related to child development and its contexts in rural China. If comparative data can be collected or identified in a sample from urban settings in China or from rural settings in other countries, comparative studies based on these datasets may generate insightful results

and thus greatly contribute to our understanding of parenting and human development across regions and cultures.

In summary, as one of the first large-scale studies aimed at examining children living in rural areas in less developed countries, this study provides a comprehensive assessment of the relationship between parenting and child psychological maladjustment in rural China. The study presents a new territory of examining the relationships between parental behaviors and child mental health. It not only views the impacts of parental practices on child psychological adjustment in the individual level as well as family level, but also examines the influence of community-level parenting on the parenting-child-adjustment relations. The findings from this study not only contribute additional insights to our view of the variability that characterizes the relationship between parenting and children's developmental trajectories, but also serve as a guide for future research in this under-studied population. Furthermore, in a population where fewer existing programs have targeted at promoting child and adolescent's psychological health, the results from this study and subsequent research will serve as a knowledge base on which prevention and intervention programs integrating individual characteristics, family processes, and community contexts can be developed.

## Appendices

### Article 1

#### Appendix A Map and some developmental indicators for Gansu



Gansu and Neighboring Provinces, People's Republic of China

#### 1998 Socio-economic development Indicators, Gansu, China

Region	Illiterate and semi-illiterate Rate <sup>1</sup> (% to population aged 15 & over)	Per Capita Annual Disposable Income of Urban Households (Yuan)	Per Capita Annual Net Income of Rural Household <sup>2</sup> (Yuan <sup>3</sup> )
National:	15.78	5425.10	2162.00
Gansu:	28.65	4009.61	1393.05

Source: China statistical Yearbook (1999). <http://www.stats.gov.cn/yearbook/indexC.htm>.

Note:

1. Illiterate and semi-illiterate population in this table refers to the population aged 15 and over, who are unable or very difficult to read. The illiterate rate in Gansu is the fourth largest, only following Tibet (59.97%), Qinghai (42.92%), and Guizhou (28.98%).

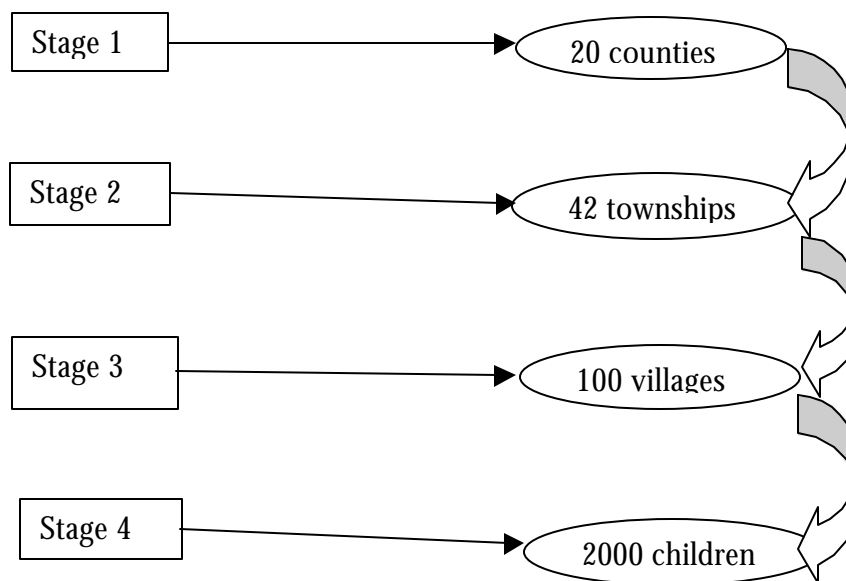
2. The per capita annual net income of rural household in Gansu is the fourth lowest, only more than Yunan (1387.25), Guizhou (1334.46), and Tibet (1231.50).

3. 1 Chinese Yuan = 0.12 US\$

## Appendix B Sampling Strategy (for GSCF, 2000)

Based on a stratified, fixed interval, systematic sampling strategy, the Gansu Statistical Bureau helped sample 2000 children from across rural Gansu province. The first step was to sample the counties. A systematic sample of 20 counties was selected from the total of 86 counties in Gansu. Specifically, all counties (The Zang counties were not included due to policy restriction) in Gansu were listed in descending order according to per capita income level in each county. Beginning from a randomly selected county, every fourth county was selected into the sample county pool. The second step is to select towns from the sample counties. A random start, systematic sample of 42 townships was selected from the list of all the townships (the townships were listed in geographic order) in each sample county. The number of townships selected from each county was determined according to the rural population in each selected county. The third step is to get 100 sample villages from the 42 sampled townships. Again a random start and systematic sample strategy was applied. The total number of villages selected from each town was pre-determined by the rural population in that town. Finally, a random sample of 20 children was selected from a listing of all 9-13 years old children in each selected village. The process of sampling was illustrated below.

Illustration of Multi-stage Cluster Sampling Process



## Appendix C Measures

The measures are from the Child Questionnaire (originally in Chinese). The items measuring child problems and parenting in the Mother Questionnaire are the same as those in the Child Questionnaire except that the items are asked from the parents' perspective.

### *Items for measuring parental warmth (19 items)*

Your parents ...

- discuss with you about something you did wrong
- remind you that you did something wrong
- encourage you to work hard
- talk to you friendly
- encourage you to think independently
- reasoning
- involve in school work
- talk to you often
- notice your bad mood
- notice your problems
- ask about your homework
- ask about your school
- read story book with you
- tutor you with homework
- praise you
- show affection to you
- discuss with you on your interest

You like to ...

- talk to your parents about your problems
- speak out different opinions

Response scale: 1 = never 2 = sometimes 3 = often

### *Items for measuring parental punishment (8 items)*

Parents ...

- blame or beat the child when s/he did something wrong
- scold the child
- beat/hit the child
- hit the child when angry
- punish the child
- don't play with child (ignore)
- not allow child to watch TV
- Punish the child when not listening

Response scale: 1 = never 2 = sometimes 3 = often

*Items for measuring children's internalizing behaviors (18 items)*

The child ...

- secretive
- can't concentrate
- can't get mind off strange thoughts
- easily gets flushed
- too dependent
- indifferent to others
- shy
- is teased
- lacks guilt
- tries to get attention
- suspicious
- moody
- feels worthless
- stays alone
- nervous
- overtired, lack energy
- stays quietly
- things to be worried about

Response Scale:

1 = don't agree at all, 2 = don't agree, 3 = agree, 4 = absolutely agree

*Items for measuring children's externalizing behaviors (18 items)*

The child ...

- argues a lot
- loses temper
- brags
- shows off
- steals
- destroys things
- violates school rules
- jealous
- not listen to others
- tries to get attention
- suspicious
- acts without thinking
- often says nasty things
- teases a lot
- lying or cheating
- hot temper
- very stubborn, not listen to others' advices
- threatens people

Response Scale:

1 = don't agree at all, 2 = don't agree, 3 = agree, 4 = absolutely agree

*Items for measuring spousal care (5 items)*

You and your spouse ...

tell each other about unpleasant experience

easily notice the unhappy feeling of the spouse

When you notice your spouse is unhappy, you will initiate a talk with him/her.

When you feel unhappy, your spouse can easily notice it.

When your spouse notices your bad mood, s/he will talk to you.

Response scale: 1 = never 2 = sometimes 3 = often

*Items for measuring spousal share (7 items)*

You and your spouse discuss and decide together on ...

child schooling

purchasing durable goods

what kind of crops to plant

buying livestock

managing family expenditures

how to discipline child

how to deal with family issues

Response scale: 1 = never 2 = sometimes 3 = often

*Items for measuring mothers' satisfaction to life (3 items)*

You are confident of your future.

In all, you feel very happy.

In all, you are satisfied with your life.

Response Scale:

1 = don't agree at all, 2 = don't agree, 3 = agree, 4 = absolutely agree

## **Article 2**

### **Appendix A** Unconditional Model Example

Following Singer (1998) & Bryk (1992), the model specification for unconditional means model at the individual-level is:

$$Y_{ij} = \beta_{0j} + \hat{a}_{ij}, \quad (1.1)$$

The village level model is:

$$\beta_{0j} = \gamma_{00} + \mu_{0j} \quad (1.2)$$

Substituting (1.2) into (1.1) yields the multilevel model:

$$Y_{ij} = \gamma_{00} + \mu_{0j} + \hat{a}_{ij} \quad (1.3)$$

where  $Y_{ij}$  is the  $i^{\text{th}}$  child outcome in the  $j^{\text{th}}$  village,  $\beta_{0j}$  in (1.1) and (1.2) is the expected average value of child outcome in the  $j^{\text{th}}$  village (i.e. expected group mean).  $\gamma_{00}$  tells us the estimated average child outcome in the population (i.e. expected grand mean).  $\hat{a}_{ij}$ , the unique contribution of each individual, is the residual associated with the  $i^{\text{th}}$  child in the  $j^{\text{th}}$  village. The estimated variance of  $\hat{a}_{ij}$  (i.e.  $\sigma^2$ ) can tell whether there is significant individual variability in the child outcome among children within each village. By including the term  $\mu_{0j}$ , the village-level residual related to  $\beta_{0j}$  in equation (1.2), I am interested in testing whether the average child problem score varies across villages.

## Appendix B Conditional Model Example (individual-level variables only)

Using child internalizing problems as the example, the specification of the individual-level (within village) model is:

$$Y_{ij} = \beta_{0j} + \beta_{1j}^* (\text{Parental Warmth})_{ij} + \beta_{2j}^* (\text{Parental Punishment})_{ij} + \sum \beta_{kj}^* X_{kij} + a_{ij}, \quad (2.1)$$

where  $\beta_{0j}$  is the intercept;  $\beta_{1j}$  is the partial effect of parental warmth on child internalizing problem;  $\beta_{2j}$  is the partial effect of parental punishment on child internalizing problem;  $X_{kij}$  is the  $k^{\text{th}}$  control variable (including interaction terms) associated with child  $i$  in village  $j$ ;  $\beta_{kj}$  and  $a_{ij}$  is the partial effect of the variable  $k$  on child internalizing problems.  $a_{ij}$  is the unique contribution of each individual (random error), which is assumed to be independently and normally distributed with variance  $\sigma^2$ .

The village level model is:

$$\beta_{0j} = \gamma_{00} + \mu_{0j} \quad (2.2)$$

$$\beta_{1j} = \gamma_{10} + \mu_{1j} \quad (2.3)$$

$$\beta_{2j} = \gamma_{20} + \mu_{2j} \quad (2.4)$$

$$\beta_{kj} = \gamma_{k0} \quad (2.5)$$

The inclusion of the residual terms  $\mu_{1j}$  and  $\mu_{2j}$  for the slopes of parental warmth ( $\beta_{1j}$ ) and of parental punishment ( $\beta_{2j}$ ) in equations (2.3) and (2.4) allows me to test whether the effect of parental warmth or punishment on child internalizing problems varies across villages, over and upon the effects of individual-level variables. For the simplicity of the model, I constrain the other individual-level slopes to be constant across villages, which is shown in equation (2.5) where no random effect term ( $\mu_{kj}$ ) is specified. Substituting (2.2), (2.3), (2.4), and (2.5) into (2.1) yields the multilevel model:

$$Y_{ij} = \gamma_{00} + \gamma_{10}^* (\text{Parental warmth})_{ij} + \gamma_{20}^* (\text{Parental punishment})_{ij} + \sum \gamma_{k0}^* X_{kij} + \mu_{0j} + \mu_{1j}^* (\text{Parental warmth})_{ij} + \mu_{2j}^* (\text{Parental punishment})_{ij} + a_{ij} \quad (2.6)$$

The interpretations for the estimates  $\gamma_{00}$ ,  $\mu_{0j}$ , and  $a_{ij}$  are the same as in equation (1.3) except that now they are conditional on the control of the parenting variables and other variables in the model.  $\gamma_{10}$  is the expected average slope coefficient of parental warmth on child internalizing problems across villages, it tells overall whether the relationship between the parental warmth and the child outcome is significant.  $\mu_{1j}$  is the residual of  $\beta_{1j}$  for the  $j^{\text{th}}$  village. By examining whether the variance of  $\mu_{1j}$  (i.e.  $\hat{\sigma}_{11}$ ) is significantly different from zero, the question of whether the effect of parental warmth on child internalizing problems differs across villages after controlling for the other variables in the model can be answered.  $\gamma_{20}$  and  $\mu_{2j}$  are the estimates related to parental punishment. They can be similarly interpreted as  $\gamma_{10}$  and  $\mu_{1j}$ .

### Appendix C Conditional Model Example (individual-level and village-level variables)

The general specification of the multilevel model at individual level is the same as equation (2.1) in Appendix B:

$$Y_{ij} = \beta_{0j} + \beta_{1j}^* (\text{Parental Warmth})_{ij} + \beta_{2j}^* (\text{Parental Punishment})_{ij} + \beta_{kj}^* X_{kij} + a_{ij}, \quad (3.1)$$

The between village model now contains the village-level variables. Using village prevalence of warm parenting as an example, the specification of the model is:

$$\beta_{0j} = \gamma_{00} + \gamma_{01}^* (\text{Village warm parenting})_j + \mu_{0j} \quad (3.2)$$

$$\beta_{1j} = \gamma_{10} + \gamma_{11}^* (\text{Village warm parenting})_j + \mu_{1j} \quad (3.3)$$

$$\beta_{2j} = \gamma_{20} + \gamma_{21}^* (\text{Village warm parenting})_j + \mu_{2j} \quad (3.4)$$

$$\beta_{kj} = \gamma_{k0} \quad (3.5)$$

Substituting (3.2), (3.3), (3.4), and (3.5) into (3.1) yields the multilevel model:

$$Y_{ij} = \gamma_{00} + \gamma_{01}^* (\text{Parental warmth})_{ij} + \gamma_{20}^* (\text{Parental punishment})_{ij} + \gamma_{k0}^* X_{kij} + \gamma_{01}^* (\text{Village warm parenting})_j + \gamma_{11}^* (\text{Parental warmth})_{ij}^* (\text{Village warm parenting})_j + \gamma_{21}^* (\text{Parental punishment})_{ij}^* (\text{Village warm parenting})_j + \mu_{0j} + \mu_{1j}^* (\text{Parental warmth})_{ij} + \mu_{2j}^* (\text{Parental punishment})_{ij} + a_{ij} \quad (3.6)$$

In equation (3.6), all the  $\gamma$ s are the fixed effects, all the  $\mu$ s and  $a_{ij}$  are the random effects. The interpretations for the estimates  $\gamma_{00}$ ,  $\gamma_{10}$ ,  $\gamma_{20}$ ,  $\gamma_{k0}$ , the  $\mu$ s, and  $a_{ij}$  are the same as in equation (2.6) in Appendix B. The estimate of  $\gamma_{01}$  and its associated test tell us whether and how village-level child problems differ by village warm parenting after controlling for all the other variables in the model. The estimate of  $\gamma_{11}$  tests the cross-level interaction, that is, the interaction between individual-level parental warmth and village-level warm parenting, which tells us whether and how the relationships between parental warmth and child problems differ by village warm parenting, over and upon the effects of other variables in the model. Similarly,  $\gamma_{21}$  tells us whether and how the relationships between parental punishment and child problems differ by village warm parenting, over and upon the effects of other variables in the model. The other village-level variables can be easily incorporated into the model in the similar way.

### **Article 3**

#### **Appendix A** A description of structural equation modeling

Structural equation modeling (SEM) is also called causal modeling, latent variable structural equation modeling, and analysis of covariance structures. SEM is a method for representing, estimating, and testing a theoretical network (model) of mostly linear relations between variables, where those variables may be either observable or directly unobservable, and may only be measured imperfectly (Rigdon, 1998). It allows great flexibility in how the equations are specified, including allowing reciprocal relationships and allowing the disturbances for different equations to be either correlated or uncorrelated, and thus allows the analyst to study complex indirect and simultaneous effects within and across levels of the system. The methodology also allows researchers to compare the performance of a model across multiple populations (Rigdon, 1998), thus providing the possibility to compare the relationships among different groups. In addition, SEM not only allows modeling of relationships among underlying constructs (latent variables) but also takes into consideration the measurement error. It allows researchers to explicitly recognize the imperfect nature of their measures, therefore reducing the effects of unreliability and invalidity that exist in measured variables (Hoyle & Smith, 1994; Keith, 1993).

**Appendix B** Model fit indices in SEM

Each model will be examined in terms of model fit. In this study, I plan to use the following indexes as the evidence of model fit: Chi-square, Goodness-of-Fit Index (GFI), stem-and-leaf plot for standardized residuals, and Q-plot. Chi-square is a measure of overall fit of the model to the data. It measures the difference between the sample covariance matrix and the fitted covariance matrix. A small Chi-square corresponds to a good fit and a large Chi-square to a bad fit (Joreskog & Sorbom, 1993; Browne, 1984). Considering the fact that Chi-square tends to be large in large samples if the model does not hold, I also utilize the GFI as an index of whether the model fit. The GFI does not depend on sample size explicitly and measures how much better the model fits as compared to no model at all (Joreskog et al., 1993). Standardized residuals provide a statistical metric for judging the size of a residual. A good model is characterized by a stem-leaf plot in which the residuals are symmetrical around zero, with most in the middle and fewer in the tails. An excess of residuals on the positive or negative side indicates that residuals may be systematically under- or over-estimated. The Q-plot provides another way to estimate model fit through examining the standardized residuals. The Q-plot of a good model is characterized by the points falling approximately on a 45° line (reference line). Deviations from the reference line are indicative of specification errors in the model, nonlinear relationships among the variables, or non-normality in the variables (Joreskog & Sorbom, 1993).

**Appendix C** Comparison of the Mean of each Variable by Gender and by Village SES Level

	By village SES levels			By gender	
	low SES	mid SES	high SES	female	male
1. Internalizing Problems	40.99	40.24	38.71	39.83	40.13
2. Externalizing Problems	35.52	34.52	33.19	34.1	34.72
3. Parental Warmth	40.62	41.44	41.69	40.86	41.64
4. Parental Punishment	13.85	12.79	12.49	12.9	13.18
5. Mothers' Negative Feeling	2.17	2.2	2.28	2.25	2.19
6. Spousal Care	11.46	11.51	11.96	11.55	11.74
7. Father's Education	5.81	7.23	7.76	6.89	6.98
8. Mother's Education	2.12	4.46	5.79	4.04	4.21
9. Family Wealth (log <sub>2</sub> )	12.62	13.21	13.84	13.2	13.24
10. Child Age	10.99	10.98	11.12	11.04	11.02
11. Number of Siblings	2.45	2.34	2.18	2.44	2.2

**Appendix D-1** Correlation Matrix by Gender (n=1078 for male, 922 for female)

	1	2	3	4	5	6	7	8	9	10	11
1. Internalizing Problems		.79	-.10	.38	.01	-.03	-.12	-.03	-.12	-.18	.07
2. Externalizing Problems	.77		-.20	.39	-.02	-.04	-.10	-.01	-.07	-.21	.03
3. Parental Warmth	-.04	-.12		-.14	.08	.03	.07	.12	.01	.18	.03
4. Parental Punishment	.32	.35	-.08		.01	-.02	-.13	-.10	-.13	-.18	.01
5. Mothers' neg. feeling	.03	.02	.03	.08		-.09	.04	.00	-.03	.02	.03
6. Spousal Care	.01	-.03	.06	-.04	-.05		.01	.06	.10	.01	-.11
7. Father's Education	-.08	-.10	.04	-.11	.07	.05		.38	.25	.04	-.01
8. Mother's Education	-.17	-.15	.12	-.14	.02	.06	.36		.23	-.01	-.10
9. Family Wealth (log <sub>2</sub> )	-.10	-.14	.06	-.17	-.01	.11	.26	.31		.06	-.09
10. Child Age	-.12	-.18	.16	-.13	.06	-.04	.06	.01	.10		.01
11. Number of Siblings	.05	.06	-.02	.07	.08	-.06	.08	-.13	-.08	.14	
MEAN (male)	40.09	34.67	41.67	13.14	2.19	11.75	7.03	4.30	13.27	11.02	2.20
STD (male)	8.36	9.44	5.67	3.19	.82	2.23	3.47	3.53	1.37	1.10	.67
MEAN (female)	39.86	34.13	40.84	12.93	2.25	11.54	6.85	3.97	13.18	11.04	2.44
STD (female)	7.81	8.95	5.61	3.06	.81	2.26	3.62	3.49	1.36	1.08	.76

Note: the correlation above diagonal is for males, and below diagonal is for females.

**Appendix D-2** Correlation Matrix by Village SES Level (n=660 for low SES, n=660 for mid SES, n=680 for high SES)

	1	2	3	4	5	6	7	8	9	10	11	12
Low SES Villages												
1. Internalizing Problems												
2. Externalizing Problems	.77											
3. Parental Warmth	.02	-.08										
4. Parental Punishment	.30	.36	-.01									
5. Mothers' negative feeling	.10	.08	.04	.08								
6. Spousal Care	.04	.00	.09	.04	-.06							
7. Father's Education	-.11	-.12	.07	-.09	.07	.03						
8. Mother's Education	-.15	-.12	.17	-.08	-.02	.02	.30					
9. Family Wealth (log <sub>2</sub> )	-.10	-.12	.06	-.07	-.06	-.05	.20	.12				
10. Child Age	-.14	-.24	.11	-.16	.07	.00	.01	-.07	.06			
11. Child Gender	-.01	-.01	.12	.05	-.03	.06	.05	.05	.00	-.03		
12. Number of Siblings	.05	.07	-.02	-.03	.09	-.06	.08	-.09	.01	.06	-.22	
MEAN	40.99	35.51	40.61	13.84	2.17	11.46	5.81	2.12	12.62	10.99	.49	2.45
STD	8.05	9.26	5.84	3.23	.74	2.41	3.84	2.86	1.28	1.10	.50	.77
Middle SES Villages												
1. Internalizing Problems												
2. Externalizing Problems	.78											
3. Parental Warmth	-.10	-.18										
4. Parental Punishment	.35	.33	-.08									
5. Mothers' negative feeling	-.04	-.08	.08	.00								
6. Spousal Care	-.02	-.04	.01	-.06	-.10							
7. Father's Education	-.05	-.02	-.02	-.08	-.01	.00						
8. Mother's Education	-.06	-.03	.06	-.04	-.03	.02	.31					
9. Family Wealth (log <sub>2</sub> )	-.01	-.03	-.09	-.11	-.08	.14	.17	.10				
10. Child Age	-.14	-.14	.13	-.12	.02	-.03	.05	-.07	.07			
11. Child Gender	-.02	.01	.06	.02	-.01	.04	.01	.03	.01	.03		
12. Number of Siblings	.05	.02	-.03	-.01	.08	-.07	.06	-.03	-.07	.10	-.10	
MEAN	40.27	34.56	41.50	12.81	2.20	11.53	7.24	4.47	13.22	10.98	.57	2.32
STD	8.20	9.61	5.64	3.00	.92	2.29	3.38	3.47	1.37	1.11	.50	.69

**Appendix D-2** (continued)

	1	2	3	4	5	6	7	8	9	10	11	12
High SES Villages												
1. Internalizing Problems												
2. Externalizing Problems	.79											
3. Parental Warmth	-.11	-.20										
4. Parental Punishment	.38	.40	-.21									
5. Mothers' negative feeling	.04	.01	.02	.09								
6. Spousal Care	-.03	-.04	.00	-.02	-.06							
7. Father's Education	-.07	-.09	.07	-.10	.07	.01						
8. Mother's Education	.02	.02	.07	-.03	-.01	.03	.32					
9. Family Wealth (log <sub>2</sub> )	-.11	-.05	.04	-.09	.02	.13	.20	.14				
10. Child Age	-.16	-.20	.26	-.18	.03	-.03	.07	.07	.07			
11. Child Gender	.09	.10	.03	.06	-.06	.03	-.03	.00	.03	-.03		
12. Number of Siblings	.01	-.02	.08	.04	.05	-.10	.05	-.05	-.03	.09	-.19	
MEAN	38.72	33.22	41.73	12.50	2.28	11.97	7.77	5.80	13.84	11.12	.55	2.17
STD	7.93	8.65	5.43	3.00	.78	1.98	3.08	3.16	1.18	1.06	.50	.67

**Appendix E-1** Goodness-of-Fit Indices for Comparison of Alternative Models for the Whole Sample (n=2000)

Model	Specification	$\div 2$	df	p-value	$\div 2$	df
1	Free all $\tilde{\alpha}$ s and the $\hat{\alpha}$ s specified as BE(1,2:3-6) BE(3,4:5,6) BE(5,6)	22.24	12	.035		
2	Based on Model 1: Fix all $\tilde{\alpha}$ s which are non-sig in Model 1	32.19	24	.122	9.95 <sup>ns</sup>	12
3	Based on Model 2: Fix BE(4,6) BE(1,2:5,6)	35.54	29	.187	3.35 <sup>ns</sup>	5
4	Based on Model 3: Free BE(6,5) (test: recursive)	34.35	28	.19	2.19 <sup>ns</sup>	1
5	Based on Model 3: Free BE(3,4:1,2) (test: recursive)	31.4	25	.176	4.14 <sup>ns</sup>	4

Note:

1. BE(3,4:5,6) refers to BE(3,5), BE(3,6), BE(4,5), and BE(4,6); 3-6 refers to 3, 4, 5, 6.  
The same rule applies to Appendices G-1 & H-1 also;
2. ns – non-significant.

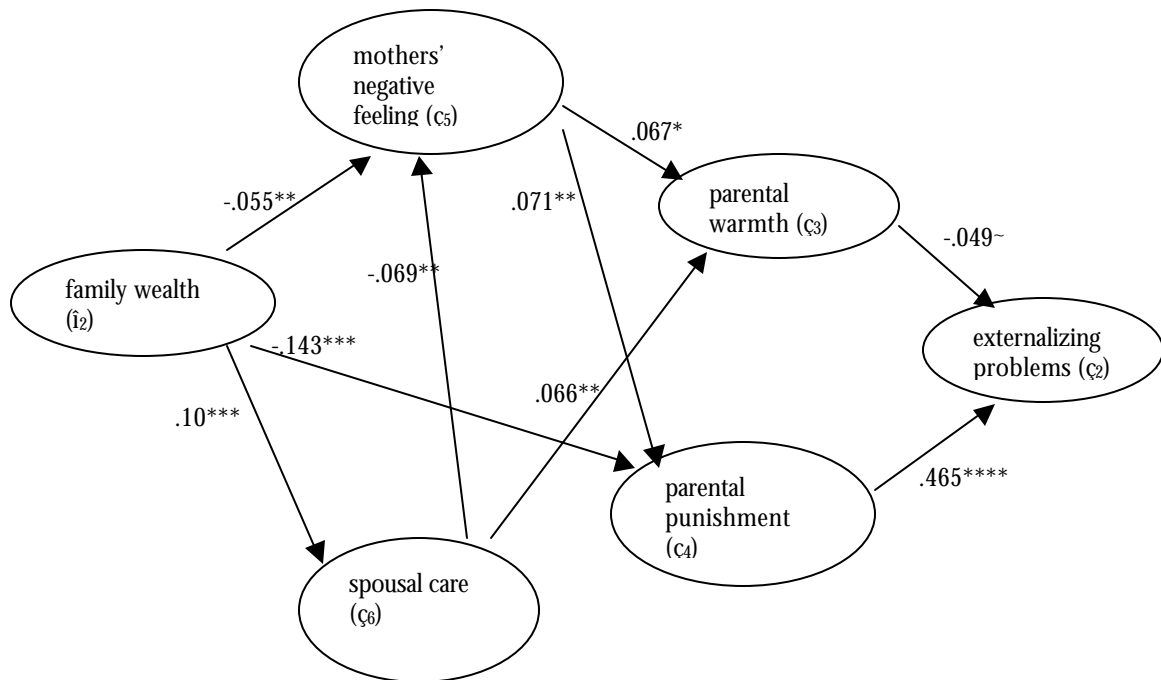
**Appendix E-2** The Estimated Slope Coefficients and Standard Errors Showing the Intermediate Effects of Parental Behaviors (whole sample, n=2000)

	Beta (direct effect of $\zeta$ on $\zeta$ )		Gamma (direct effect of $\hat{i}$ on $\zeta$ )						
	parental warmth ( $\zeta_3$ )	parental punishment ( $\zeta_4$ )	mothers' negative feeling ( $\zeta_5$ )	spousal care ( $\zeta_6$ )	parents' education ( $\hat{i}_1$ )	family wealth ( $\hat{i}_2$ )	child age ( $\hat{i}_3$ )	child gender ( $\hat{i}_4$ )	number of siblings ( $\hat{i}_5$ )
internalizing problems ( $\zeta_1$ )	.024 (.04 <sup>ns</sup> )	1.359 (.09 <sup>***</sup> )					-.545 (.16 <sup>**</sup> )		.511 (.23 <sup>*</sup> )
externalizing problems ( $\zeta_2$ )	-.087 (.04 <sup>*</sup> )	1.602 (.10 <sup>***</sup> )					-.885 (.18 <sup>***</sup> )		.582 (.25 <sup>*</sup> )
parental warmth ( $\zeta_3$ )			.408 (.15 <sup>**</sup> )	.165 (.07 <sup>**</sup> )	.07 (.04 <sup>*</sup> )		.797 (.11 <sup>***</sup> )	.751 (.25 <sup>**</sup> )	
parental punishment ( $\zeta_4$ )			.223 (.08 <sup>**</sup> )		-.085 (.02 <sup>***</sup> )	-.266 (.05 <sup>***</sup> )	-.436 (.06 <sup>***</sup> )	.296 (.13 <sup>*</sup> )	
mothers' negative feeling ( $\zeta_5$ )				-.028 (.01 <sup>**</sup> )	.02 (.01 <sup>***</sup> )	-.033 (.01 <sup>*</sup> )	.028 (.02 <sup>-</sup> )		.079 (.03 <sup>**</sup> )
spousal care ( $\zeta_6$ )						.146 (.04 <sup>***</sup> )		.194 (.10 <sup>-</sup> )	-.252 (.07 <sup>***</sup> )

Note:

1. The number in parenthesis is standard error;
2. ~p<.10, \*p<.05, \*\*p<.01, \*\*\*p<.001, ns – non-significant.

**Appendix F** The pathways from family wealth to child externalizing problems through parental warmth and punishment (n=2000). The numbers are completely standardized path coefficients.



Note: The total indirect effect of family wealth on child externalizing problems is  $-.069$  (standardized solution) which is significant ( $p < .001$ ).

**Appendix G-1** Goodness-of-Fit Indices for Comparison of Alternative Models for the Gender Groups  
(n=1078 for boys, 922 for girls)

Model	Specification	$\chi^2$	df	p-value	AIC	BIC
1	Free all $\gamma$ s and the $\gamma$ s specified as BE(1,2:3-6) BE(3,4:5,6) BE(5,6) (same pattern for two groups)	31.01	18	.029		
2	Model 1: Fix $\gamma$ s which are non-significant in both groups	44.94	34	.099	13.93 <sup>ns</sup>	16
3	Model 2: Fix $\gamma$ s BE(4,6) BE(1,2:5,6) in both groups	49.33	44	.268	4.39 <sup>ns</sup>	10
4	Model 3: Equal all $\gamma$ s	57.18	52	.289	7.85 <sup>ns</sup>	8
5	Model 4: Fix GA(3,4), Free GA(1,2:4), Equal all $\gamma$ s except GA(2,2)	64.89	66	.515	7.71 <sup>ns</sup>	14
6	Model 5: EQ GA(2,2)	74.48	67	.248	9.59 <sup>**</sup>	1

Note: \*\*p<.01, ns – non-significant.

**Appendix G-2** The Estimated Slope Coefficients and Standard Errors Showing the Intermediate Effects of Parental Behaviors (gender comparison, n=1078 for boys, 922 for girls).

	Beta (direct effect of $\zeta$ on $\zeta$ )				Gamma (direct effect of $\hat{\imath}$ on $\zeta$ )			
	parental warmth ( $\zeta_3$ )	parental punishment ( $\zeta_4$ )	mothers' negative feeling ( $\zeta_5$ )	spousal care ( $\zeta_6$ )	parents' education ( $\hat{\imath}_1$ )	family wealth ( $\hat{\imath}_2$ )	child age ( $\hat{\imath}_3$ )	number of siblings ( $\hat{\imath}_4$ )
internalizing problems ( $\zeta_1$ )	.024 (.04 <sup>ns</sup> )	1.337 (.09 <sup>***</sup> )					-.539 (.17 <sup>**</sup> )	.532 (.24 <sup>*</sup> )
externalizing problems ( $\zeta_2$ )	-.086 (.05 <sup>~</sup> )	1.589 (.10 <sup>***</sup> )				.287(.12 <sup>*</sup> ) for boys; -.239 (.13 <sup>~</sup> ) for girls	-.874 (.19 <sup>***</sup> )	.615 (.27 <sup>*</sup> )
parental warmth ( $\zeta_3$ )			.394 (.16 <sup>**</sup> )	.169 (.07 <sup>**</sup> )	.117 (.03 <sup>***</sup> )	.029 (.10 <sup>ns</sup> )	.773 (.12 <sup>***</sup> )	
parental punishment ( $\zeta_4$ )			.23 (.09 <sup>**</sup> )		-.083 (.02 <sup>***</sup> )	-.271 (.05 <sup>***</sup> )	-.428 (.07 <sup>***</sup> )	
mothers' negative feeling ( $\zeta_5$ )				-.027 (.01 <sup>**</sup> )	.014 (.01 <sup>**</sup> )	-.025 (.01 <sup>~</sup> )	.031 (.02 <sup>~</sup> )	.069 (.03 <sup>**</sup> )
spousal care ( $\zeta_6$ )						.138 (.04 <sup>***</sup> )		-.217 (.07 <sup>**</sup> )

Note: 1. The slope coefficients are the same for boys and girls except when otherwise noted in the table;  
 2. The number in parenthesis is standard error;  
 3. <sup>~</sup>p<.10, \*p<.05, \*\*p<.01, \*\*\*p<.001, ns – non-significant.

**Appendix H-1** Goodness-of-Fit Indices for Comparison of Alternative Models for the Group Comparisons Based on Village SES Level (n=660 for low SES, n=660 for middle SES, n=680 for high SES).

Model	Specification	$\chi^2$	df	p-value	AIC	Adf
1	Free all $\gamma$ s and the $\gamma$ s specified as BE(1,2:3-6) BE(3,4:5,6) BE(5,6) (same pattern for all groups)	53.54	42	.109		
2	Model 1: Fix $\gamma$ s which are non-significant in all groups	97.48	81	.102	43.94 <sup>ns</sup>	39
3	Model 2: Fix $\gamma$ s BE(4,6) BE(1,2:5,6) in all groups	110.65	96	.146	13.17 <sup>ns</sup>	15
4	Model 3: Equal BE(3:5,6), BE(5,6) BE(1,4,5)=(3,4,5), BE(1,2:3,4)	124.37	111	.182	13.72 <sup>ns</sup>	15
4a	Model 4: Equal BE(4,5)	136.84	112	.055	12.47 <sup>***</sup>	1
5	Model 4: Equal all the $\gamma$ s except those in Model 6	157.21	141	.166	32.84 <sup>ns</sup>	30
6	Model 5: Equal GA(3,3) (1,2) (6,2) (2,5)	187.21	145	.014	30 <sup>***</sup>	4

Note: \*\*\*p<.001, ns – non-significant.

**Appendix H-2** The Estimated Slope Coefficients and Standard Errors Showing the Intermediate Effects of Parental Behaviors (Village comparison, n=660 for low SES, n=660 for middle SES, n=680 for high SES)

	Beta (direct effect of $\zeta$ on $\zeta$ )			Gamma (direct effect of $\hat{i}$ on $\zeta$ )					
	parental warmth ( $\zeta_3$ )	parental punishment ( $\zeta_4$ )	mothers' negative feeling ( $\zeta_5$ )	spousal care ( $\zeta_6$ )	parents' education ( $\hat{i}_1$ )	family wealth ( $\hat{i}_2$ )	child age ( $\hat{i}_3$ )	child gender ( $\hat{i}_5$ )	number of siblings ( $\hat{i}_6$ )
internalizing problems ( $\zeta_1$ )	.028 (.04 <sup>ns</sup> )	1.339 (.09 <sup>***</sup> )				.096(.09 <sup>ns</sup> ) for low & mid; -.374(.15 <sup>**</sup> ) for high	-.54 (.16 <sup>**</sup> )		.469 (.24 <sup>*</sup> )
externalizing problems ( $\zeta_2$ )	-.084 (.04 <sup>-</sup> )	1.603 (.10 <sup>***</sup> )					-.884 (.18 <sup>***</sup> )		.956(.32 <sup>**</sup> ) for low; .307(.29 <sup>ns</sup> ) for mid & high
parental warmth ( $\zeta_3$ )			.401 (.15 <sup>**</sup> )	.141(.07 <sup>*</sup> )			.633 (.14 <sup>***</sup> )	.775 (.24 <sup>**</sup> )	
parental punishment ( $\zeta_4$ )			.49(.11 <sup>***</sup> ) for low & high; -.084 (.13 <sup>ns</sup> ) for mid		-.057 (.02 <sup>**</sup> )	-.194 (.05 <sup>***</sup> )	-.436 (.06 <sup>***</sup> )	.313 (.13 <sup>*</sup> )	.025 (.09 <sup>ns</sup> )
mothers' negative feeling ( $\zeta_5$ )				-.029 (.01 <sup>**</sup> )	.019 (.01 <sup>**</sup> )	-.043 (.01 <sup>**</sup> )			.079 (.02 <sup>**</sup> )
spousal care ( $\zeta_6$ )						-.116(.07 <sup>ns</sup> ) for low; .213(.05 <sup>***</sup> ) for mid & high			-.193 (.07 <sup>**</sup> )

Note: 1. The slope coefficients are the same for the three groups except when otherwise noted in the table;  
 2. The number in parenthesis is standard error;  
 3. ~p<.10, \*p<.05, \*\*p<.01, \*\*\*p<.001, ns – non-significant.

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