



CULTURAL AND CONTEXTUAL EFFECTS ON CHILDREN'S SOCIAL EMOTIONAL DEVELOPMENT AND WELL BEING

by Stacey Ngoc B Doan

This thesis/dissertation document has been electronically approved by the following individuals:

Wang, Qi (Chairperson)

Ceci, Stephen John (Minor Member)

Casasola, Marianella (Minor Member)

CULTURAL AND CONTEXTUAL EFFECTS ON CHILDREN'S SOCIAL
EMOTIONAL DEVELOPMENT AND WELL BEING

A Dissertation

Presented to the Faculty of the Graduate School
of Cornell University

In Partial Fulfillment of the Requirements for the Degree of
Doctor of Philosophy

by

Stacey Ngoc B Doan

August 2010

© 2010 Stacey Ngoc B. Doan

CULTURAL AND CONTEXTUAL EFFECTS ON CHILDREN'S SOCIAL EMOTIONAL DEVELOPMENT AND WELL BEING

Stacey Ngoc B. Doan, Ph. D.

Cornell University 2010

Integrating emotional, socio-cultural and developmental perspectives, the current research focuses on examining the emergence of self-regulatory abilities and emotion understanding in children. In particular, the studies explore how mother-child interactions serve as a mechanism underlying the development of these complex social-cognitive abilities. The first study examines in a cross-cultural context the role that maternal verbal interactions play in affecting children's developing emotion knowledge. Furthermore, two of the current studies examine how these abilities relate to later psycho-social adjustment, of these two one specifically examines how culture moderates these effects. I take a bio-ecological systems theory approach, which argues that multiple environmental and individual subsystems play important roles in influencing children's development. Furthermore, the specific mechanisms and consequences of these interactions on children's socio-emotional understanding and mental health outcomes through the lens of the cultural-fit hypothesis, which emphasizes the person-situation interaction and highlights how psychological processes may vary across cultures and contexts. In sum, the current set of studies is designed to explore how culture and context affect parenting and children's social-emotional abilities, and how these abilities affect children's mental health.

BIOGRAPHICAL SKETCH

Stacey Ngoc B. Doan attended Carleton College, where she received a B.A. Psychology in 2002 with honors. She then worked as a research specialist for the Center for Youth Development at the University of California, Davis before beginning graduate work in the Department of Human Development at Cornell University. She received a masters degree in Human Development in 2008, and a doctorate in Developmental Psychology in 2010, both from Cornell University. Dr. Stacey N. Doan will start an assistant professor position in the Psychology Program at the Boston University in September 2010.

ACKNOWLEDGMENTS

I thank my Special Committee members for their feedback, guidance, support, and inspiration. To Dr. Qi Wang for providing me with the training, expertise and knowledge to become a cross-cultural researcher. Dr. Marianella Casassola, for her support, advice and friendship. To Dr. Stephen Ceci for his humor, and constancy. A special thanks to Dr. Gary W. Evans for his generosity, kindness and mentorship. And finally, to my parents, family, friends and all who crossed my path and helped me to become the person that I am.

TABLE OF CONTENTS

Biographical Sketch	iii
Acknowledgements	iv
List of Figures	vi
List of Tables	vii
Chapter 1: Cumulative Risk and Children's Internalizing and Externalizing Problems: The Mediating Role of Maternal Responsiveness and Children's Self-Regulation	1
Chapter 2: Culture, Mother's Use of Mental State Language and Children's Emotion Understanding: A Latent Growth Curve Analysis	37
Chapter 3: Culture moderates the relationship between emotion understanding and children's internalizing problems.	67

LIST OF FIGURES

Figure 1.1 Conceptual model testing both direct and indirect effects of cumulative risk on maternal responsiveness, self-regulation and adolescent behavioral problems.

Figure 1.2 Measurement model for latent constructs.

Figure 1.3 Final reduced model.

Figure 2.1: Fitted growth in children's EK by culture

Figure 2.2: Fitted growth in children's EK by culture and levels of mental state language.

Figure 3.1: Longitudinal associations between children's EK and internalizing problems by culture.

LIST OF TABLES

Table 1.1: Means and Standard Deviations for All Measured Study Variables

Table 2.1: Estimates for Latent Growth Model for Children's Emotion Situation Knowledge.

Table 3.1: Means and Standard Deviations of Mother and Child Variables by Culture

CHAPTER 1

CUMULATIVE RISK AND CHILDREN'S INTERNALIZING AND EXTERNALIZING PROBLEMS: THE MEDIATING ROLES OF MATERNAL RESPONSIVENESS AND SELF-REGULATION

Abstract

The current paper uses structural equation modeling to test the hypotheses that in the context of poverty, responsive parenting is reduced, resulting in lower levels of self-regulation in young children. Furthermore, reduced responsiveness in parents and compromised self-regulatory abilities in children lead to mental health problems in later life. The study utilizes a three-wave, longitudinal design with multiple measures of risk and self-regulation from multiple observers.

Introduction

Children growing up in poverty are much more likely to develop a host of physical, mental and cognitive problems (see Bradley & Corwyn, 2002 for a review). While the specific pathways by which early experiences of poverty affect later behavioral problems are less clear, a host of evidence suggests that poverty has detrimental effects on both parenting and children's self-regulatory abilities, variables which have been demonstrated to affect children's behavioral problems. In the current study, we integrate research from the poverty literature, with research examining associations between parenting, self-regulation, and children's behavioral problems to test a conceptual model of behavioral problems among adolescents. Specifically, we are interested in testing the hypothesis that the effects of early cumulative risk on adolescents' behavioral problems are mediated by maternal responsiveness and children's self-regulatory abilities.

Cumulative Risk

Development occurs in multiple contexts and is influenced by individual, family, and environmental characteristics (Bronfenbrenner & Morris, 1998; Bronfenbrenner & Evans, 2000). Within the environment of poverty, children are exposed to a variety of risk factors. Multiple or “cumulative risk” models argue for the idea that children’s developmental outcomes are better predicted by examining the accumulation of these risk factors in relation to a variety of different domains (Rutter, 1979; Evans, 2003). For example, children growing up in the context of poverty are exposed to both physical (e.g. crowding, noise) and psychosocial (e.g. marital separation, violence) stressors (Evans & English, 2002). While each individual risk factor may not have equal impact on children’s development, studies that have examined multiple risk have found that the number of risk factors present is a better predictor of children’s IQ and social-emotional status than any one risk factor or subset thereof (Sameroff et. al., 1987; Liaw & Brooks-Gunn, 1994).

Early empirical evidence for cumulative risk models was derived from the Isle of Wight study (Rutter, 1979), which identified several risk factors correlated with childhood psychiatric disorders, including severe marital discord, low social status, large family size, paternal criminality, and maternal mental disorder. Findings from this study demonstrated that while no single risk factor significantly increased risk for childhood psychiatric disorders, the presence of four risk factors yielded a tenfold increase in the likelihood of mental disorder. Similarly, the Rochester Longitudinal Study (RLS, Sameroff, 2000) yielded results which demonstrated linear or additive effects of risk factors on outcomes. Specifically, measuring ten risk factors (which included history of maternal mental disorder, high maternal anxiety, rigid parental attitudes, few positive parent child interactions, unskilled occupational status, low maternal education status, disadvantaged minority status, single parenthood, stressful

life events, and large family size), researchers found that the number of risk factors was associated with behavior problems in preschool (Sameroff et al., 1987) as well as with mental health and problem behaviors in adolescence (Sameroff et al., 1998).

In sum, multiple risk accounts for a considerable proportion of the variance in children's adjustment; however, it is not clear which variables mediate the relationship between risk and children's adjustment. Research on the effects of cumulative risk have suggested that individual- and family-level variables play important roles in influencing children's psychological adjustment (Evans & English, 2002, Evans et al., 2007; Mistry et al., 2002). For example, maternal responsiveness and children's self-regulation abilities are severely compromised in the context of poverty (Evans et. al., 2007; Evans, Boxhill, & Pinkava, 2008; Evans & English, 2002). Furthermore, both of these variables have been shown to be instrumental in children's adaptation and well-being (Eisenberg, Cumberland & Spinrad, 1998; Gottman, Katz, & Hooven, 1997).

Poverty and parenting

Arguably, the single most important factor accounting for differences in outcomes between low-SES and high-SES children is the exposure to stress (McLoyd, 1998) and its consequences on parenting. Many researchers have consistently emphasized that families living in poverty are disproportionately exposed to threatening, destabilizing and uncontrollable life events such as violence, unstable employment, family dissolution, as well as environmental stressors such as noise, substandard housing and crowding (Bradley & Whiteside-Mansell, 1997; Evans & English, 2002). Coping with inordinate negative life events and stressors, as well as diminished social support networks (Evans, Boxhill, & Pinkava, 2008; Hashima, & Amato, 1994) may not only lead to increased depression, anxiety, and hostility in parents (Gallo & Matthews, 1999) but also to learned helplessness and to a reduced

orientation towards mastery and efficacy in children (Baum et. al., 1999; McLoyd, 1998).

These stressors and their effects in turn reduce the capacity of caregivers to provide sensitive and responsive parenting (Conger et al., 1992, 1994; Elder, Van Nguyen, & Caspi, 1995; McLoyd, 1997, 1998), in addition to increasing the likelihood of abuse for children (Garbarino, 1992). Under conditions of stress, parents are more likely to be less child-centered and less nurturing and are more likely to engage in rejecting and inconsistent parenting behaviors, which in turn lead to lower levels of psychological well-being in children (Conger et al., 1992; Lempers, Clark-Lempers, and Simons, 1989).

For example, in examining the role of family processes in mediating the link between poverty and children's social adjustment, Mistry et al., (2002) found that economically distressed parents perceive themselves as less competent and less able to discipline their children, and that they express more negative affect (e.g. anger) when disciplining their children. They were also observed as expressing less warmth and affection. In turn, their children were rated by teachers as being less socially competent and having more problem behaviors. Additionally, Brody, Flor & Gibson (1999) found that maternal beliefs of parenting effectiveness were associated with perceived family financial resources. Furthermore, when financial stress was high, mothers set lower developmental goals for their children and were less likely to engage in activities promoting their competence. These variables in turn resulted in poorer self-regulation and reduced academic and psychosocial competence in children. Empirical support for the path linking low SES to lower competence and harsh, restrictive parenting has also been demonstrated by several longitudinal studies (Conger, Conger, & Elder, 1997).

Finally, it is important to note that while negative parenting is critical in understanding children's development, the absence of positive parenting is also of great consequence. Research has consistently demonstrated that parental sensitivity to children's emotional and instrumental needs is of fundamental importance to children's well-being (Bornstein, 1989; Corwyn et al., 2001; Demo & Cox, 2000). Furthermore, positive parenting plays an important role in developing resiliency in children (Bradley et al., 1994) and has been demonstrated to serve as a protective factor, buffering against the effects of poverty for children growing up in high-poverty, high-risk environments (Evans, et al., 2007).

Factors Affecting the Development of Self-Regulation

Self-regulation is often defined as the ability to control attention, to plan, and to inhibit or initiate behaviors that are conducive to achieving one's goals (Eisenberg, Champion, & Ma, 2004; Mischel & Ayduk, 2004). Successful regulatory competence has been associated with a host of positive outcomes (Bornstein, 2002; Rothbart & Bates, 1998; Rothbart, Ahadi, & Evans, 2000). Because self-regulation has its origins in temperament, it has often been theorized as a trait; however, many theorists believe that experiences—particularly parent-child interactions (Campos, Campos, & Barrett, 1989; Gottman, Katz, & Hooven, 1997; Eisenberg, Cumberland, & Spinrad, 1998; Kochanska, Murray, & Harlan, 2000)—play a pivotal role in affecting the development of children's self-regulatory competencies.

Studies using animal models have convincingly demonstrated that maternal behaviors increase the efficiency of the hypothalamic-pituitary-adrenal (HPA) stress response system, thereby decreasing physiological reactivity to stress (Meaney & Szyf, 2005) and leading to better cognitive and social developmental outcomes (Caldji, Diorio, & Meaney, 2000). Analogously, research among human children has consistently demonstrated that the quality of parenting plays a key role in the

development of self-regulation (Kopp, 1982). Parents who are supportive are more likely to model appropriate behaviors for dealing with stress and conflict (Power, 2004). Moreover, children of supportive parents are more likely to be motivated to listen to parents' requests, whether they are to engage in desirable behavior or to disengage from or inhibit undesirable behavior (Dix, 1991; Grusec & Goodnow, 1994). Furthermore, Gottman et al. (1997) argues that when parents encourage emotion expression and use emotion-coaching, children are less aroused in distressing situations. On the other hand, punitive negative expressivity and hostility in parents may also influence arousal in children leading to problems with planning and regulation (Hoffman, 2000). Negatively aroused children have more difficulty in applying higher-order cognitive processes such as reflection and planning, and this may, in turn, lead to social, psychological, and academic consequences (Blair, 2002).

In addition to familial process factors, contextual factors such as poverty may play an integral role in affecting children's self-regulation abilities. In particular, recent research examining models which link poverty to self-regulation have demonstrated that children growing up in a low-income environment show decreased levels of self-regulation and more learned helplessness as compared to their middle-class counterparts (Brody & Flor, 1997; Brody, Stoneman & Flor, 1996; Evans & English, 2002; Evans, 2003; Evans et al., 2005). Poverty may affect children's self-regulatory abilities directly, as well as indirectly. Stress inherent in high-risk environments may impair the adaptability of children's self-regulatory competence by straining the neuroendocrine system that influence's children's ability to respond to stress and regulate their responses (Evans, 2003). Indirectly, poverty may reduce maternal responsiveness which in turn would lead to lower self-regulation in children. For example, using a short term longitudinal design with a middle-class normative sample, Lengua, Honorado, & Bush (2007), assessed nine demographic and

psychosocial risk factors, along with parenting and children's effortful control (a variant of self-regulation) at 33-40 months and six months later. Results of the study suggested that cumulative risk was negatively related to effortful control, and mothers' limit-setting and scaffolding mediated the association. Thus, both distal factors like poverty and proximal factors like parenting play important roles in affecting the development of children's self-regulatory processes.

Factors affecting children's internalizing and externalizing problems.

While genetic factors evidently play a role in the development of behavioral problems (Coie & Dodge, 1998), clear evidence also exists for the role of environmental factors. As previously discussed children growing up in poverty are more likely to exhibit behavioral problems (Bradley & Corwyn, 2002). Recently, Appleyard et. al. (2005) tested a linear (additive) and threshold (quadratic) model of cumulative risk during early and middle childhood on adolescents internalizing and externalizing problems. Cumulative risk was measured during early childhood (0-5 years of age) and middle childhood (1st, 2nd, 3rd and 6th grades). Children's behavioral problems were measured at age 7, 12 and 16. While results of the study supported a linear model of risk such that children who experience more risk factors are at an increased risk for problems, there does not seem to be a particular threshold in which problems increase in a multiplicative way. Furthermore, cumulative risk during early childhood was a better and more consistent predictor of adolescent behavior problems than cumulative risk during middle childhood. Finally, risk factors were more consistently associated with externalizing problems rather than internalizing problems.

In addition to risk factors, maternal sensitivity have also been demonstrated to be pivotal in influencing children's adjustment (Bornstein, 2002). This substantive finding has been found across ethnic groups (Brody et al., 2002; Eisenberg et al.,

2009) as well as marital status (Jackson et al., 2000). In further support of this idea, in a twin study, Caspi and his colleagues (2004) found that the twin exposed to more maternal warmth, was less prone to behavioral problems. Moreover, some researchers have argued that parenting actually mediates the link between poverty and children's outcomes (Brody et al., 1994; Conger & Elder, 1994; Elder, 1999; Elder et al., 1995; McLeod & Shanahan, 1993; McLoyd, 1998; Mistry et al., 2002; Moen, Kain, & Elder, 1983; McLoyd, 1990).

Recent literature on cumulative risk has continued to support the idea that family processes, particularly parenting, represent an important proximal process that mediates the relationship between risk factors and children's outcomes. Trentacosta and his colleagues (2008) examined the role of cumulative risk, parenting, and children's internalizing and externalizing problems in the context of prevention program for toddlers living in poverty. Seven risk factors (neighborhood quality, single adult status, caregiver educational status, overcrowding, adolescent parenthood, legal conviction among adults living the home, and drug or alcohol problems) were assessed at Time 1 when the children were two years of age. Parenting was assessed at age 3 three by trained experimenters, and behavior problem scores were reported by the primary caregiver at two and three years of age. Path analytic models were used to examine relations between risk and parenting, and between parenting and children's behavior problems. With regards to both internalizing and externalizing problems, model fit was excellent, suggesting that parenting did seem to mediate the link between risk and child behavior problems. However, direct paths between risk factors and children's behavior problems were not statistically significant. The authors argue that the developmental period of the child may play a role in determining the effect of distal risk factors, such that in early childhood, cumulative risk may operate indirectly—through parenting, as the parent-child context is the primary context for

development. On the other hand, direct effects of risk factors such as neighborhood quality and material resources may be more likely to occur during adolescence (see Ackerman, Brown, & Izard, 2004), when there is less reliance on caregivers.

While overall the literature suggests that cumulative risk often leads to less sensitive parenting and that parenting affects children's outcomes, the results of parenting on outcomes tend to be modest in magnitude (see Bornstein, 2002), which suggests the importance of considering mediating variables. Because parenting has been demonstrated to affect children's self-regulatory processes, a host of studies have suggested that self-regulation mediates the relationships between parental processes and children's outcomes—including social competence (Eisenberg et al., 2001b), psychological functioning and health behaviors (Brody & Ge, 2001), and children's externalizing problems (Eisenberg et al., 2005; Valiente et al., 2006; Eiden, Edwards, & Leonard, 2007). Eisenberg et al. (2001b) used structural equation modeling to test relations between mothers' expressed positive and negative emotion on 55-79-month-olds' self-regulation, social competence and adjustment. Results supported the overall model: parents who regulated their own emotion, and who expressed more positive affect and reduced negative affect were more likely to have children with higher levels of self-regulation. Furthermore, children with higher self-regulation abilities were less likely to experience internalizing and externalizing problems. However, it is important to note that the indirect effects of maternal expression of emotion on children's internalizing problems through self-regulation was only marginally significant, suggesting that self-regulation is more consistently related with externalizing problems (see also Lengua, West, & Sandler, 1998).

Purposes of the current study

The current study proposes to integrate the research on poverty and parenting with self-regulation and children's developmental health, and to explore longitudinal

relations between early cumulative risk, parenting, and self-regulation in early adolescence and internalizing and externalizing problems in late adolescence in a sample of rural adolescents. Specifically, we hypothesized the following longitudinal associations: 1) increased stressors or risks in the family and physical environment would lead to decreased responsive parenting; 2) decreased maternal responsiveness, in turn, would lead to decreased self-regulatory abilities in children; and 3) lower self-regulation in children would then have negative effects on children’s later mental health.

Figure 1 illustrates a saturated conceptual model, in which cumulative risk has both direct and indirect effects on maternal responsiveness, children’s self-regulation, and behavioral problems in adolescence. We will first test the full model. However, because of past research demonstrating weaker links between self-regulation and internalizing problems, as well as modest associations between parenting and children’s behavioral outcomes, once self-regulation is taken into account, we predict that these links will be weak or non-existent. In Figure 1.1, weak links are identified as dotted lines.

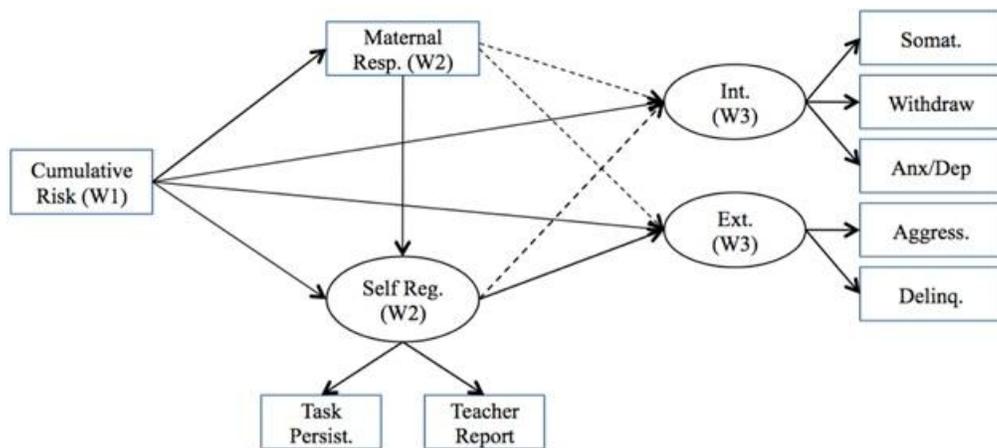


Figure 1.1. *Conceptual model testing both direct and indirect effects of cumulative risk on maternal responsiveness, self-regulation and adolescent behavioral problems.*

Methods

Participants

Middle class and participants growing up in poverty were recruited from upstate New York Co-Operative Extension and public school districts, with oversampling of low-income families as appropriate for this study's focus on poverty and children's development. The poverty sample was defined as households living at or below the federally defined poverty line. The mean income-to-needs ratio is an annually adjusted, per capita index, comparing household income to federal estimates of minimally required expenditures for food and shelter. The federal government defines poverty as an income-to-needs ratio of 1 to 1. The middle class sample had income-to-needs ratio of 2 to 4. Families were paid for their participation. The mean ages were 9.18, 13.40, and 17.45, at Wave 1, Wave 2 and Wave 3, respectively. Reflecting the demographics of Upstate New York, 97% of the sample was White, 16% of mothers high school dropouts, 32% had graduated from high school, 26% had some postsecondary education and 16% were college graduates. Attrition analyses revealed that children with higher levels of cumulative risk at Wave 1 were more likely to drop out from the study $t(336) = 8.82, p < .001$.

Procedure

A standard protocol was used in each wave for data collection at the children's homes. Mother and youth were interviewed independently by two interviewers. As this study is part of a larger examination of poverty and children's development, only tasks relevant to the current study are described here. Cumulative risk was assessed at Wave 1 when participants were in third through fifth grade. Parenting and children's self-regulation were assessed at Wave 2, and children's internalizing and externalizing problems were assessed at Wave 3.

Measures

Cumulative risk assessment. Nine domains of risk factors were assessed using interviews of mothers and youth and experimenter observations. The nine domains include environmental factors (e.g. residential density, noise levels, housing quality), psycho-social factors (e.g. family separation, turmoil, and violence), and demographic variables (e.g. single parent family, maternal high-school dropout, and income at or below the poverty line). Residential density was computed by dividing the number of individuals living in the household by the number of rooms. Noise levels were assessed by a 2-hr monitoring of decibel levels in the primary social space. Trained experimenters assessed housing quality using an observer rating scale tapping into structural quality, maintenance, cleanliness and clutter, safety hazards, children's resources and climatic conditions (Evans, Wells, Chan, & Saltzman, 2000). Psycho-social factors were determined based on interviews with both mother and child. Mothers were interviewed using the Life Events and Circumstances Checklist (Wyman, Cowen, Work & Parker, 1991). The scale consisted of multiple dichotomous (yes/no) subscales for each of the psychosocial stressors. Youth were also asked to indicate the occurrence of the stressors with a life event scale based on the Adolescent Perceived Events Scale (Compas, 1997). Similarly, the scale consists of dichotomous items assessing psychosocial stressors.

For each of the stressor domains, risk was dichotomized as 0 or 1, with 1 being equal to or greater than one standard deviation above the mean for the distribution of the specific risk factor across the entire sample of youth. Additionally, three categorical risks (maternal high school drop-out, single parent, and household income at or below the poverty line) were included. Thus for each a child, the cumulative risk index could vary from 0-9.

Maternal responsiveness: Children's perception of maternal responsiveness was measured using a scale consisting of 11 items tapping both instrumental (e.g. "help with homework") and emotional (e.g. "willing to talk to me when needed"). Youth answered each question using a 5-point scale ("never," "hardly ever," "sometimes," "fairly often," and "often"). The scaled has good internal consistency ($\alpha = .84$) and strong test-rest reliability ($r = .92$).

Indicators of Self-Regulation

Teacher Report. Self-regulation was assessed in Wave 2 with the Children's Self-Control Scale (Humphrey, 1982). The children's English teachers rated their behaviors on a 5-point rating scale (from "never true" through "almost always true"). Examples of items on this scale include "This child thinks ahead of time about the consequences of his or her actions" and "This child sticks to what he or she is doing, even on long, unpleasant tasks, until finished." The scale has sound reliability ($\alpha = .91$ in the present study) and has been validated against multiple criteria (Humphrey, 1982).

Behavioral Observation. Additionally, a measure of persistence on an impossible task was used to assess children's behavioral self-regulation. Using a behavioral protocol developed by Glass and Singer (1972), children are given a pencil-and-paper puzzle. They are told that there are two puzzles and that they can take as long as they like on the puzzles, but that once they move from the first puzzle to the second, they can't go back. Unbeknownst to the child, the first puzzle is actually impossible to solve. Time spent persisting on this task is used as an indicator of behavioral self regulation.

Mental Health. Using the Achenbach Youth Self Report (YSR, Achenbach, 1994) children reported on their levels of somatization, withdrawal, anxiety, aggression, and delinquency. Somatization, withdrawal, and anxiety are indicators of children's internalizing problems, while aggression and delinquency are indicators of children's externalizing problems. The Youth Self Report has excellent reliability and has

undergone extensive validation across a wide range of samples, 11 through 18 years of age (Achenbach, 1991). On a scale from 0 (not true) to 2 (very true or often true), participants answer whether symptoms describe them. These symptoms include “I feel lonely,” “I worry a lot,” and “I get in many fights.”

Results

Sample and Missing Data

The current study uses a subset of a larger study involving 353 individuals. Because we were interested in longitudinal associations, the sample for our analyses included all individuals who had participated in at least two of the three waves of data collection ($N = 266$). Of this total, 265 had data for Wave 1, 226 had data for Wave 2, and 239 had data for Wave 3. Individuals with only one wave of data were excluded from the analyses ($N = 87$).

Table 1.1 *Means and Standard Deviations for All Measured Study Variables*

<i>Variables</i>	All Participants (N=353)		Subsample in models (N=267)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Cumulative risk	2.39	1.95	2.01	1.75
Maternal resp.	3.152	.628	3.15	.628
Persistence	8.378	4.789	8.38	4.79
Self-control	3.714	.840	3.71	.84
Aggression	2.168	1.361	2.168	1.36
Delinquency	1.048	.710	1.048	.710
Anxiety	1.484	1.263	1.484	1.263
Somatization	.9559	.7288	.9559	.7288
Withdrawal	.9485	.6498	.9485	.6498

Of those that were not included in the analysis, 11 had no data for our variables of interest, and 76 only had data from Wave 1 (the cumulative risk index). Table 1 presents the means and standard deviations for the measured variables for the total sample and for the subsample used in the models.

Analysis Strategy and Preliminary Analyses

In order to test our hypotheses, structural equation models were estimated using Mplus 5.2 (Muthén & Muthén, 1998–2007). Before running individual models, several data screening procedures were performed to identify outliers and test for normality. Multivariate outliers were examined using the Cooks distance statistic (Cook, 1977). No outliers were found using a cutoff value of 1 (Stevens, 1984). Marginal and multivariate normality (skewness and kurtosis) were tested using PRELIS 2.54. These analyses showed some deviations from normality in marginal and multivariate distributions (DeCarlo, 1997; Kline, 2005). In particular, the Kurtosis Z-Score for the task persistence measure was -19.8 ($p < .01$), and the Kurtosis Z-Score for multivariate test was -2.20 ($p = .028$). In order to account for these deviations from normality, the maximum likelihood robust (MLR) estimator option was used in Mplus (Muthén & Muthén, 1998–2007).

While we did not expect gender to influence the paths in our model, the possibility of moderation was also explored. In particular, the Box's M Statistic (Winer, 1971) was calculated to test for homogeneity of the variance/covariance matrix with respect to gender. This test was non-significant ($p = .429$), suggesting that, in the current data, none of the paths specified in our model would vary significantly across males and females (Tabachnick & Fidell, 1996).

Correlations

Zero-order correlations between each of our measured constructs are available from the first author. As expected, our measures of self regulation were highly correlated with each other as were our measure of internalizing and externalizing behavior problems. Furthermore, cumulative risk was negatively correlated with maternal responsiveness, with both self-regulation constructs, and with both constructs measuring externalizing behavior problems. Additionally, as expected, maternal responsiveness was correlated with both of the self regulation measures, and both self

regulation measures were correlated with measures of externalizing behavior problems. Indicators of internalizing behavior problems were less correlated with our other constructs.

Four indices were used to assess goodness of fit for the models: the Tucker-Lewis Index (TLI; values of .90 or greater indicate good fit), the Comparative Fit Index (CFI; values of .90 or greater indicate good fit), the Root Mean Square Error of Approximation (RMSEA; values of .08 or less indicate good fit), and the Standardized Root-Mean-Square Residual (SRMR, values of .08 or less indicate good fit). CFI and TLI compare the improvement in fit of the tested model as compared with the null model assuming zero covariance among variables. RMSEA is a parsimony-adjusted index, and SRMR is a measure of mean residual correlation (Kline, 2005).

Measurement Model

Before running structural models to test our specific hypotheses, a measurement model was first established for our latent variables using confirmatory factor analysis (Kline, 2005). An initial measurement model was estimated which included three latent variables (self regulation, externalizing behavior problems, and internalizing behavior problems) and did not include error covariances between any of the indicators. Apart from the chi-square statistic, fit for this model was adequate: χ^2 (11, N=267) = 29.059, $p = .002$, TLI=.928, CFI=.962, RMSEA=.078 (90% confidence interval [CI]: .044, .114), SRMR=.032. However, modification indices indicated that allowing residuals of some indicators of internalizing and externalizing problems to correlate may improve the model fit. Two error covariances were added in sequence and the final revised measurement model was found to fit the data very well: χ^2 (9, N=267) = 4.569, $p = .870$, TLI=1.022, CFI=1.000, RMSEA=.078 (90% CI of .000 to .035), SRMR=.032. Allowing error variances of specific indicators to be correlated when assessed by the same reporter within a given time point is standard practice

(Cole & Maxwell, 2003). Loadings for the final measurement model are shown in Figure 1.2 Measurement model

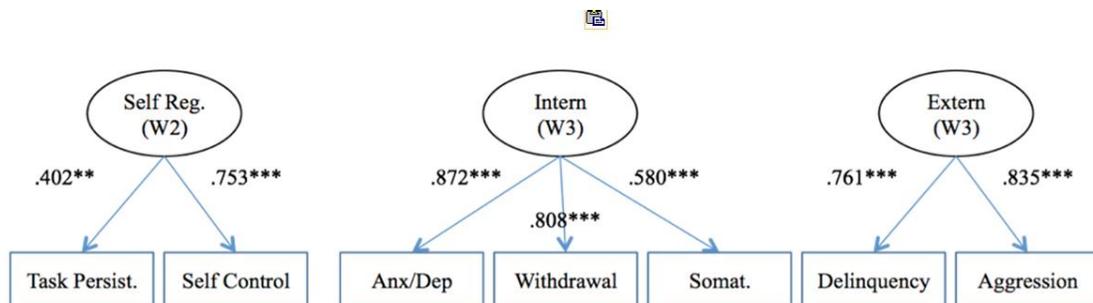


Figure 1.2 *Final loadings for measurement model.*

Structural Models

Having established a measurement model, a series of structural models were then tested to address our mediation hypotheses. We started by testing an overall model with all hypothesized links. This model fit the data very well: $\chi^2(17, N=267) = 14.322, p = .644, TLI=1.011, CFI=1.000, RMSEA=.000$ (90% CI of .000 to .046), $SRMR=.024$. However, path coefficients indicated some non-significant links. Therefore, in order to develop the most parsimonious model, we eliminated the least significant links in sequence and tested for differences in model fit. Because the chi-square statistic using MLR estimation is not appropriate for comparing nested model, we used a loglikelihood-based difference test which incorporated a scaling correction factor (Muthén & Muthén, 1998–2007; Mplus support website). In the final model three paths were eliminated: maternal responsiveness to externalizing behavior problems, maternal responsiveness to internalizing behavior problems, and cumulative risk to internalizing behavior problems. The difference in the deviance between the full model and final model was not significant: $\chi^2(3) = .905, p = .824$ (the test statistic of the loglikelihood is a distributed chi-square where the degree of freedom is equal to the difference in the number of model parameters), suggesting that the full model offered no additional explanatory power over the more parsimonious one. The final

model was found to fit the data very well: $\chi^2 (20, N=267) = 15.064, p = .773$, TLI=1.017, CFI=1.000, RMSEA=.000 (90% CI of .000 to .037), SRMR=.028. This model is shown in Figure 1.3.

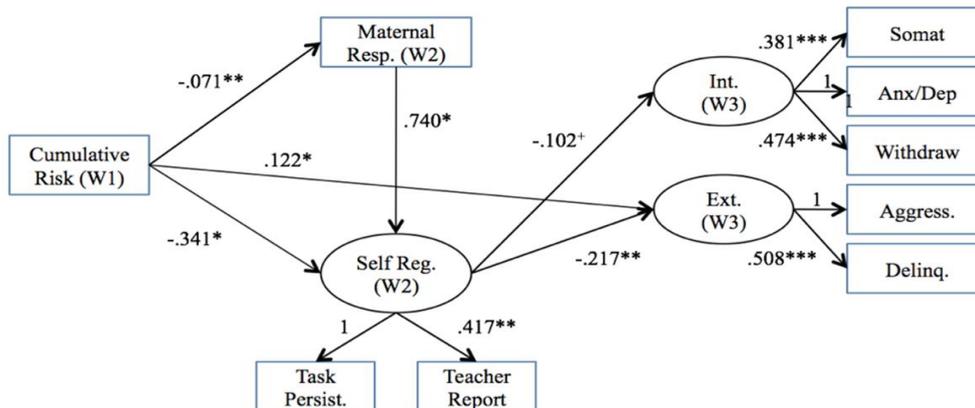


Figure 1.3 *Final structural model.*

Discussion

Previous research has demonstrated that cumulative risk plays a fundamental role in influencing the mental health of children and adolescents. Within the framework of ecological perspective, development is influenced by multiple factors including family and individual characteristics (Bronfenbrenner & Morris, 2006). The purposes of the current study were to explore the mechanisms and to understand the process by which multiple risk factors in the context of poverty may affect later adolescent behavioral problems through parent-child relationships and children's individual self-regulation abilities. We integrate research from the poverty literature and research on children's social-emotional development to test the hypotheses that early exposure to cumulative risk both negatively affects parenting and also disrupts children's self-regulation processes. Self-regulation, in turn, affects adolescent's internalizing and externalizing problems. Our findings show strong support for this mediational model.

The current study provides support for the idea that parenting and self-regulation are not just trait abilities, which are genetically determined, but instead are abilities that are heavily influenced by contextual factors. In our model, cumulative risk affects children's self-regulation abilities both directly and indirectly through parenting. The direct effect of risk factors on children's self-regulation abilities are consistent with animal models, which have demonstrated that chronic stress leads to increased reactivity and to poor regulation of stress reactivity in the HPA axis component of the stress system (Frances, Diorio, Liu, & Meaney, 1999; Ladd, Huot, Thirivikraman, Nemeroff, Meaney, & Plosky, 2000). Furthermore, chronic stress has been shown to alter neural functioning and connectivity in the amygdala, hippocampus, and prefrontal cortex—areas that have been associated with emotion regulation, control of behavior, and planning (Holmes & Welman, 2009). In humans, there has been less systematic research showing the linkages between stress and physiological outcomes. However, chronic stressful environments have been shown to increase allostatic load (a physiological measure of wear and tear on the body) in children (Evans & Kim, 2007).

In addition to direct effects, results of the current study suggest that cumulative risk also indirectly affect children's self-regulation by decreasing parent's ability to provide sensitive, nurturing care. As the levels of risk factors increased, children were more likely to report that mothers exhibit lower levels of responsiveness. Because the development of children's self-regulation abilities has been linked to positive parenting (Eisenberg et al., 2005), it is reasonable to conclude that the experience of inordinate amount of stress may decrease parents' ability to be responsive and also, perhaps, to regulate their own behaviors. Thus, parents under stress may not be as able to help children cope with stressful events but may also be modeling poor regulatory behaviors. Furthermore, while we can only draw conclusions with regards to the level

of responsivity in our data, it is likely that parents experiencing high stress would be more likely to exhibit harsh disciplinary and abusive behaviors (McLoyd et al., 1994), and these have been shown to negatively affect children's physiological responses to stress (Gunnar & Quevedo, 2008).

Consistent with previous research, children's self-regulatory abilities are more strongly associated with externalizing problems, rather than with internalizing problems (Eisenberg et al., 2001a). We find in our data that increased self-regulation was negatively associated with externalizing problems, but the relation between self-regulation and children's internalizing problems four years later, although negative, was only marginally significant. Several researchers have argued that inhibition (behavioral overcontrol) is more closely related to internalizing problems (Rothbart & Bates, 1998; Williams et al., 2009), while unmanageability– (behavioral undercontrol) is more related to externalizing problems. For example, Eisenberg et al. (2001a) hypothesized that externalizing children are low in effortful and less voluntary modes of regulation, whereas internalizing children are low to average in modes of regulation that are voluntary and effortful (especially attention regulation) but high in involuntary inhibition of behavior. Consistent with these perspectives, research has found that ego undercontrol (behavioral under-regulation) was related to externalizing problems in clinic-referred children, whereas ego overcontrol predicted internalizing problems (Huey & Weisz, 1997).

Since children with externalizing problems are characterized partly by their impulsive nature and lack of attentional control (Newman & Wallace, 1993; Robins et al., 1996 in Eisenberg et al., 2001a), and because our measures of self-regulation are particularly behavioral in nature, it would make sense that our self-regulation construct was more predict of externalizing problems. The self-control scale is a teacher report measure, and since outsiders are more able to perceive external

behaviors than internal thoughts and feelings, it is reasonable to assume that teachers were rating the participants based on behavioral aspects. Furthermore, our persistence on an impossible task is a pen and paper measure that requires sitting still and focusing on the task, tapping into behavioral and attentional control. In sum, it would be an important line of work for future research to tease apart the different components of self-regulation (e.g. affective, attention, and behavioral) in order to assess their linkages with specific types of behavioral problems.

In addition to these indirect effects, cumulative risk was also shown to directly affect adolescents' externalizing problems. However, the link between cumulative risk and children's internalizing was absent. This finding is consistent with previous research which also found more consistent links between cumulative risk and externalizing problems as compared to internalizing problems (Appleyard et al., 2005). The lack of association between early cumulative risk and children's internalizing problems might be due to the specific nature of risk factors studied here. We focused on environmental risk factors (e.g. noise, crowding) and stressful life events, but did not look at maternal depression or individual characteristics such as temperament, reactivity, or inhibition. These variables and their interactions might have more explanatory power in the case of internalizing problems. For example, some evidence demonstrates that regulative abilities predict externalizing problems, while temperament factors describing mood, and fear/withdrawal approach tendencies only played a minor role (Pitzer et al., 2009). However, while behavioral inhibition, vigilance, and withdrawn behavior have been strongly associated with internalizing problems, they actually serve as a protective factor against externalizing problems (Williams et al., 2009). In addition to temperament, other parenting variables that we did not measure might play a role. For example, Jones and colleagues (2002) found

that poor parenting was associated with externalizing, but it was the interaction between poor parenting and maternal depression that predicted internalizing problems.

In the current study, risk factors were aggregated across several domains, and data collection occurred when children were in early adolescence. Recently some researchers have argued that teasing apart domains of risk, as well as considering the developmental period of the child, would be important in ascertaining if risks in certain domains have differential influence on behavioral problems (Appleyard et al., 2005; Trentacosta, et al., 2008). For example, in our study we found that the indirect effect of cumulative risk (through maternal responsiveness) on children's self-regulation abilities was only marginally significant; it is likely that familial stress may play a particularly powerful role during early childhood, when the main context for children's development is in the context of parent-child interactions. As children become more independent and their networks expand to include peers, neighborhoods, and schools other domains of risk might become more influential in affecting outcomes. Finally, it is possible that the way in which risk factors are associated with outcomes might be influenced by individual characteristics of the child such as temperament (Corapci, 2008).

In sum, longitudinal studies which consider multiple factors including familial, individual, as well as domains of risk and trajectories of outcomes would have important implications for policy and intervention. Another limitation of the current study is that it cannot necessarily be generalized to children of other ethnic groups, because cultural factors have been demonstrated to play a role in affecting parenting (Kagan, 2001), self-regulation (Tardif, Wang, & Olson, 2009), as well as the effects of risk on children's development (Feldman & Masalha, 2007). It would be important for future work to examine the ways in which cultural values, beliefs and practices may moderate these relationships.

The current study demonstrates that the links between poverty and mental health can be partially explained by lower levels of responsive parenting and decreased self-regulatory abilities in children. This has important implications for programs targeted at alleviating the effects of poverty. If it is not possible to directly increase personal income, then programs that target reducing maternal stress would—by increasing social support networks or by providing child-care or other services that would lessen the load of parenting for mothers—decrease maternal stress and perhaps child outcomes.

REFERENCES

- Achenbach, T. M. (1991). *Manual for the Child Behavior Checklist/4-18 and 1991 Profile*. Burlington, VT: University of Vermont, Department of Psychiatry.
- Ackerman, B.P., Brown, E.D., & Izard, C.E. (2004). The relations between contextual risk, earned income, and the school adjustment of children from economically disadvantaged families. *Developmental Psychology*, 40, 204-216.
- Appleyard, K., Egeland, B., van Dulmen, M., & Sroufe, L. A. (2005). When more is not better: The role of cumulative risk in child behavior outcomes. *Journal of Child Psychology and Psychiatry* 46, 235-245
- Baum, A., Garofalo, J.P., & Yali, A.M. (1999). SES and chronic stress: does stress account for SES effects on health? In Adler NE, Marmot M, McEwen BS, Stewart J, (Eds.) *Socioeconomic Status and Health in Industrialized Nations*. New York: NY Academy of Science, 131–144.
- Blair, C. (2002). School readiness: Integrating cognition and emotion in a neurobiological conceptualization of child functioning at school entry. *American Psychologist*, 57(2), 111-127.
- Bornstein, M. H. (Ed.). (1989). *Maternal responsiveness: Characteristics and consequences*. *New Directions for Child Development*, No. 43. San Francisco: Jossey-Bass.
- Bornstein, M. H. (Ed.). (2002). *Handbook of Parenting: Practical Issues in Parenting* (2nd ed., Vol. 5). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.
- Bradley, Robert H., and R. F. Corwyn. "SES and Child Development." *Annual Review of Psychology*, vol. 53, 2002, in press.
- Bradley, R. H., & Whiteside-Mansell, L. (1997). Children in poverty. In R. T. Ammerman & M. Hersen (Eds.),

Handbook of prevention and treatment with children and adolescents (pp. 13-58).
New York: Wiley.

Bradley, R. H., Whiteside, L., Mundfrom, D. J., Casey, P. H., Kelleher, K. J., & Pope, S. (1994a). Early indications of resilience and their relation to experiences in the home environments of low birthweight, premature children living in poverty.

Child Development, 65, 346-360

Bradley, R., Whiteside, L., Mundfrom, D., Casey, P., Kelleher, K. J., & Pope, S.

(1994b). The contribution of early intervention and early caregiving experiences to resilience in low birth-weight, premature children living in poverty. *Journal of Clinical Child Psychology, 23*, 425-434.

Brody, G. H., & Flor, D. L. (1998). Maternal resources, parenting practices, and child competence in rural, single-parent African American families. *Child Development, 69*, 803– 816. *Child Development, 65*, 649 – 665.

Brody, G. H., Ge, X., Conger, R., Gibbons, F. X., Murry, V. M., Gerrard, M. & Simons, R. L. (2001). The influence of neighborhood disadvantage, collective socialization, and parenting on African American children's affiliation with deviant peers. *Child Development, 72*, 1231-46.

Brody, G.H., Flor, D.L., & Gibson, N.M. (1999). Linking maternal efficacy beliefs, developmental goals, parenting practices, and child competence in rural single-parent African American families. *Child Development, 70*, 1197–208.

- Brody, G.H., Murry, V., McBride, K., Brown, A. (2002). Longitudinal pathways to competence and psychological adjustment among African American children living in rural single-parent households. *Child Development*, 73, 1505-16.
- Brody G. H., Flor, D, L. (1996). Coparenting, family interactions, and competence among African American youths. *New directions for child development*, (74), 77-91.
- Brody, G .H., Stoneman, Z. Flor, D. McCrary, C. Hastings, L. Conyers, O. (1994). Financial resources, parent psychological functioning, parent co-caregiving, and early adolescent competence in rural two-parent African-American families. *Child Development*, 65, 590-605.
- Bronfenbrenner, U. & Evans, G.W. (2000). Developmental science in the 21st century: Emerging theoretical models, research designs, and empirical findings. *Social development*, 9, 115-125.
- Bronfenbrenner, U. & Morris, P. (1998). The ecology of developmental process. In W. Damon & R. Lerner (Eds.), *Handbook of child psychology* (5th ed., pp. 992-1028). New York: Wiley.
- Bronfenbrenner, U., & Morris, P. A. (2006). The bioecological model of human development. In W. Damon & R. M. Lerner (Eds.), *Handbook of child psychology, Vol. 1: Theoretical models of human development* (6th ed., pp. 793-828). New York: John Wiley.
- Caldji C., Diorio J., Meaney, M.J., (2000). Variations in maternal care in infancy regulate the development of stress reactivity. *Biological Psychiatry*, 48, 1164-74.
- Campos, J. J., Campos, R. G., & Barrett, K. C.(1989). Emergent themes in the study of emotional development and emotional regulation. *Development Psychology*, 25, 394-402.

- Caspi A, Moffitt TE, Morgan J, Rutter M, Taylor A, Arseneault L, Tully L, Jacobs C, Kim-Cohen J, and Polo-Tomas, M. (2004). Maternal expressed emotion predicts children's antisocial behavior problems: Using monozygotic-twin differences to identify environmental effects on behavioral development. *Developmental Psychology*, 40:149-161.
- Coie, J.K. & Dodge, K.A. (1998). Aggression and antisocial behavior. In W. Damon (Editor in Chief) and N. Eisenberg (Vol. Ed.), *Handbook of child psychology*, 5th edition. Volume 3. Social, emotional, and personality development. NY: John Wiley & Sons.
- Cole, D.A., & Maxwell, S.E. (2003). Testing mediational models with longitudinal data: Myths and tips in the use of structural equation modeling. *Journal of Abnormal Psychology*, 112, 558-577.
- Compas, B.E. (1987). Stress and life events during childhood and adolescence. *Clinical Psychology Review*, 7, 275-302.
- Conger, R.D., & Elder, G.H.J. (1994). *Families in troubled times: Adapting to change in rural America* (1st ed.). New York: Aldine De Gruyter .
- Conger, R.D., Conger, K.J., & Elder, G.H. (1997). Family economic hardship and adolescent adjustment: mediating and moderating processes(pp. 288–310) . In G.J. Duncan & J. Brooks-Gunn (Eds.) *Consequences of Growing Up Poor*. New York: Russell Sage Found.
- Conger, R.D., Conger, K.J., Elder, G.H., Lorenz, F., Simons, R., & Whitbeck, L. (1992). A family process model of economic hardship and adjustment in early adolescent boys. *Child Development*, 63, 526–541.
- Conger, R.D., Ge, X., Elder, G.H.J., Lorenz, F.O., & Simons, R.L. (1994). Economic stress, coercive family process, and developmental problems of adolescents . *Child Development*, 65, 541–561

- Cook, R. (1977). Detecting of influential observations in linear regression models, *Technometrics*, 19, 15-18.
- Corapci, F. (2008). The role of child temperament on Head Start Preschoolers' social competence in the context of cumulative risk. *Journal of Applied Developmental Psychology*, 29, 1-16.
- DeCarlo, L. T. (1997). On the meaning and use of kurtosis. *Psychological Methods*, 2, 292-307.
- Demo, D. H., and Cox, M. (2000). "Families with Young Children: A Review of Research in the 1990s." *Journal of Marriage and the Family* 62:876–895.
- Dix T. (1991). The affective organization of parenting: Adaptive and maladaptive processes. *Psychological Bulletin*. 110, 3–25.
- Eiden, R. D., Edwards, E. P., & Leonard, K. E. (2007). A conceptual model for the development of externalizing behavior problems among kindergarten children of alcoholic families: Role of parenting and children's self-regulation. *Developmental Psychology*, 43, 1187-1201.
- Eisenberg, N., Champion, C., Ma, Y. (2004). Emotion-related regulation: An emerging construct *Merrill-Palmer Quarterly* , 50, 236-258.
- Eisenberg, N., Chang, L., Ma, Y., & Huang, X.. (2009). Relations of parenting style to Chinese children's effortful control, ego resilience, and maladjustment. *Development and Psychopathology*, 21, 455-477.
- Eisenberg, N., Cumberland, A., & Spinrad, T. (1998). Parental socialization of emotion. *Psychological Inquiry*, 9, 241-273.
- Eisenberg, N., Cumberland, A., Spinrad, T.L., Fabes, R. A. Shepard, S.A., Reiser, M., et. al. (2001a). The relations of regulation and emotionality to children's externalizing and internalizing problem behavior. *Child Development*, 72, 1112-1134.

- Eisenberg, N., Gershoff, E., Fabes, R., Shepard, S., Cumberland, A., Losoya, S., Guthrie, I., & Murphy, B. (2001b). Mothers' emotional expressivity and children's behavior problems and social competence: Mediation through children's regulation. *Developmental Psychology*, 37, 475-490.
- Eisenberg, N., Qing, Z., Spinrad, T.L., Valiente, C. Fabes, R.A., Liew, J. (2005). Relations among positive parenting, children's effortful control, and externalizing problems: a three-wave longitudinal study. *Child Development*, 76, 1055-71.
- Elder, G. H., Jr., Eccles, J. S., Ardel, M., & Lord, S. (1995). Inner-city parents under economic pressure: Perspectives on the strategies of parenting. *Journal of Marriage and the Family*, 57, 771-784.
- Elder, G., Van Nguyen, T., & Caspi, A. (1985). Linking family hardship to children's lives. *Child Development*, 56, 361-375.
- Elder, G.H. (1999). *Children of the Great Depression: Social Change in Life Experiences 25th Anniversary Edition*. Boulder, CO: Westview Press.
- Evans, G.W. (2003). A Multimethodological analysis of cumulative risk and allostatic load among rural children. *Developmental Psychology*, 39(5), 924-933.
- Evans, G.W. & English, K. (2002). The environment of poverty: Multiple stressor exposure, psychophysiological stress, and socioemotional adjustment. *Child Development*, 72(4), 1238-1248.
- Evans, G.W. & Kim, P. (2007). Childhood poverty and health. *Psychological Science*, 18, 953-957.
- Evans, G.W., Boxhill, L., & Pinkava, M. (2008). Poverty and maternal responsiveness: The role of maternal stress and social resources. *International Journal of Behavioral Development*, 32(3), 232-237.

- Evans, G.W., Kim, P., Ting, A., Tesher, H., & Shannis, D. (2007). Cumulative risk, maternal responsiveness, and allostatic load among young adolescents. *Developmental Psychology*, 43(2), 341-351.
- Evans, G.W., Wells, N.M., Chan, H.E. & Saltzman, H. (2000). Housing quality and mental health, *Journal of Consulting and Clinical Psychology*, 68, pp. 526–530.
- Evans, G.W., Gonella, C., Marcynszyn, L.A., Gentile, L. & Salpekar, N. (2005). The role of chaos in poverty and children's socioemotional adjustment. *Psychological Science*, 16(7):560-565.
- Feldman, R. & Masalha, S. (2007). The role of culture in moderating the links between early ecological risk and young children's adaptation. *Development and Psychopathology*, 19, 1-21.
- Francis, D., Diorio, J., Liu, D., & Meaney, M.J. (1999). Nongenomic transmission across generations of maternal behavior and stress responses in the rat. *Science*, 286, 1155–1158.
- Gallo, L.C. & Matthews, K.A. (1999). Do negative emotions mediate the association between socioeconomic status and health? *Annual NY Academy of Science*. 896,226–245.
- Garbarino, J. and Kostelny, K. (1992). Child maltreatment as a community problem. *International Journal of Child Abuse and Neglect*, 16(4), 455-464.
- Glass, D. C., & Singer, J. E. (1972). *Urban stress*. New York: Academic Press.
- Gottman, J.M., Katz, L.F., & Hooven, C. (1997). *Meta-emotion: How families communicate emotionally*. Hillsdale, NJ: Earlbaum.
- Grusec, J.E. & Goodnow, J.J. 1994. Impact of parental discipline methods on the child's internalization of values: A reconceptualization of current points of view. *Developmental Psychology*, 30, 4-19. doi: 10.1037/0012-1649.30.1.4 .

- Gunnar, M.R. & Quevedo, K.M. (2008). Early care experiences and HPA axis regulation in children: a mechanism for later trauma vulnerability. *Progress in Brain Research*, 167, 137-49.
- Hashima, P.Y. & Amato, P. (1994). Poverty, social support, and prenatal behavior. *Child Development*, 65, 394-403.
- Hoffman, M. (2000). *Empathy and moral development: Implications for caring and justice*. New York, N.Y.: Cambridge.
- Holmes, A., & Wellman, C.L. (2009). Stress-induced prefrontal reorganization and executive dysfunction in rodents. *Neuroscience and Biobehavioral Reviews*, 33, 773–783.
- Huey, S. J., Jr., & Weisz, J. R. (1997). Ego control, Ego resiliency, and the Five-Factor Model of personality as predictors of behavior problems in clinic-referred children. *Journal of Abnormal Psychology*, 106, 404-415.
- Humphrey, L.L. (1982). Children's and teachers' perspectives on children's self-control: The development of two rating scales. *Journal of Consulting and Clinical Psychology*, 50, 624–633.
- Jackson, A. Brooks-Gunn, J., Huang, C., & Glassman, M. (2000). Single mothers in low-wage jobs: Financial strain, parenting and preschools' outcomes. *Child Development*, 71, 1409-1423.
- Jones, D.J., Forehand, R. Brody, G., Armisead, L. (2002). Psychosocial adjustment of Afridan America Children in single-mother families: A test of three risk models. *Journal of Marriage and Family*, 64, 105-15.
- Kagan, J. (2001). Biological constraint, cultural variety, and psychological structures. *Annals of the New York Academy of Sciences*, 935- 177-190.
- Kline, R. B. (2005). Principles and practice of structural equation modeling. (2nd Edition). New York: The Guilford Press. Chapter 3, pp. 45-62.

- Kochanska, G., Murray, K.T., & Harlan, E. (2000). Effortful control in early childhood: Continuity and change, antecedents, and implications for social development. *Developmental Psychology*, 36, 220-232.
- Kopp, C. (1982). The antecedents of self-regulation: A developmental perspective. *Developmental Psychology*, 18, 199–214.
- Ladd, C. O., Huot, R. L., Thrivikraman, K. V., Nemeroff, C.B., Meaney, M. J., & Plotsky, P. M. (2000). Long- term behavioral and neuroendocrine adaptations to adverse early experience. *Progress in Brain Research*, 122, 81–103.
- Lempers, J.D., Clark-Lempers, D., & Simons, R.L. (1989). Economic hardship, parenting, and distress in adolescence. *Child Development*. 60, 25–39.
- Lengua, L. J., Honorado, E., & Bush, N. (2007). Cumulative risk and parenting as predictors of effortful control and social competence in preschool children. *Journal of Applied Developmental Psychology*, 28, 40-55.
- Lengua, L.J., West, S.G., & Sandler, I.N. (1998). Temperament as a predictor of symptomatology in children: Addressing contamination of measures. *Child Development*, 164-181.
- Liaw, F. & Brooks-Gunn, J. (1994). Cumulative familial risks and low birth weight children's cognitive and behavioral development. *Journal of clinical child psychology*, 23, 360-372.
- McLeod, J.D. & Shanahan, M.J. (1993). Poverty, parenting and children's mental health. *American Sociological Review*, 58(3), 351-366.
- McLoyd, V.C. (1990). The impact of economic hardship on Black families and children.: Psychological distress, parenting and socioemotional development. *Child Development*, 61, 311-346.
- MacLeod, J. (1987). *Ain't no making it: Leveled aspirations in a low-income neighborhood*. Boulder, CO: Westview.

- McLoyd, V. C. (1998). Socioeconomic disadvantage and child development. *American Psychologists*, 53, 185-204.
- McLoyd, V.C. Jayaratne, T.E. Ceballo, R. & Borquez, J. (1994). Unemployment and work interruption among African American single mothers: effects on parenting and adolescent, socioemotional functioning. *Child Development*, 65, 562-589.
- Meaney MJ, Szyf M. 2005 Maternal care as a model for experience-dependent chromatin plasticity? *Trends in Neurosciences* 28:456-463.
- Mischel, W., & Ayduk, O. (2004). "Willpower in a cognitive-affective processing system: The dynamics of delay of gratification". In R. F. Baumeister & K. D. Vohs (Eds.), *Handbook of self-regulation: Research, Theory, and Applications* (pp. 99-129). New York: Guilford.
- Mistry, R. S., Vandewater, E. A., Huston, A. C., & McLoyd, V. C. (2002). Economic well-being and children's social adjustment: The role of family process in an ethnically diverse low-income sample. *Child Development*, 73, 667-681.
- Moen, P. Edward, L. & Elder, G. (1983). Economic conditions and family life: Contemporary and historical perspectives (pp. 213-259). In *American families and the economy: The high costs of living*. (Eds. R.R. Nelson & F. Skidmore.) Washington, D.C.: National Academy Press.
- Moen, P., Kain, E. L., & Elder, Jr., G. H. (1983). Economic conditions and family life: Contemporary and historical perspectives. In R. R. Nelson & F. Skidmore (Eds.), *The high costs of living: Economic and demographic conditions in American families* (pp. 213-259). Washington, DC: National Academy Press.
- Muthen, L.K. & Muthen, B.O. (1998-2007). Mplus User's Guide. Fifth Edition. Los Angeles, CA: Muthen & Muthen.

- Newman, J. P., Wallace, J. F., Strauman, T. J., Skolaski, R. L., Oreland, K. M., Mattek, P. W., Elder, K. A., McNeely, J. (1993). Effects of motivationally significant stimuli on the regulation of dominant responses. *Journal of Personality and Social Psychology*, 65, 165-175.
- Pitzer, M., Esser, G., Schmidt, M.H., Laucht, M, (2009) Temperamental predictors of externalizing problems among boys and girls: a longitudinal study in a high-risk sample from ages 3 months to 15 years. *European archives of psychiatry and clinical neuroscience*, 259, 445-58.
- Power, T.E. (2004) Stress and coping in childhood: The parent's role: *Parenting: Science and Practice*, 4, 271-317.
- Robins, R.W., John, O.P., Caspi, A. Moffit, T.E. & Stouthamer-Loeber, M. (1996). Resilient, overcontrolled, and undercontrolled boys: Three replicable personality types. *Journal of Personality and Social Psychology*, 70, 157-171.
- Rothbart, M. K., Ahadi, S. A., & Evans, D. E. (2000). Temperament and personality: Origins and outcomes. *Journal of Personality and Social Psychology*, 78, 122-135.
- Rothbart, M. K., & Bates, J. E. (1998). Temperament. In W. Damon (Series Ed.) & N. Eisenberg (Vol. Ed.), *Handbook of child psychology: Vol. 3. Social, emotional and personality development* (5th ed., pp. 105-176). New York: Wiley.
- Temperament-Part 1 (pgs. 105-139) & Temperament-Part 2 (pgs. 140-176).
- Rutter, M. (1979).
- Protective factors in children's responses to stress and disadvantage. In M.W. Kent & J.E. Rolf (Eds.) *Primary prevention of psychopathology: Vol. 3 Social competence in children* (pp. 49-74). Hanover, NH: University Press of New England.

- Sameroff, A. (2000). Ecological perspectives on developmental risk. In J. D. Osofsky & H.E. Fitzgerald (Ed.), *WAIMH handbook of infant mental health: Infant Mental Health in Groups at High Risk, vol. 4* (pp. 1–33). New York: Wiley.
- Sameroff, A.J., Seifer, R., Barocas, R. Zax, M., & Greenspan, S. (1987). Intelligence quotient scores of 4-year-old children: Social environmental risk factors. *Pediatrics, 79*, 343-35.
- Sameroff, A., Seifer, R., Barocas, P., Zax, M., & Greenspan, S. (1987). Intelligence quotient scores of 4-year-old children: Social environmental risk factors. *Child Development, 64*, 80–97.
- Sameroff, A., Seifer, R., Zax, M., & Barocas, P. (1987). Early indicators of developmental risk: Rochester Longitudinal Study. *Schizophrenia Bulletin, 13*, 383–394.
- Sameroff, A. J., Bartko, W. T., Baldwin, A., Baldwin, C., & Seifer, R (1998). Family and social influences on the development of child competence. In C. Feiring & M. Lewis (Eds.), *Families, risk and competence* (pp. 161-185). Mahwah, NJ: Lawrence Erlbaum.
- Stevens, J. P. (1984). *Outliers* and influential data points in regression analysis. *Psychological Bulletin, 95* , 334-344.
- Tabachnick, B. G., & Fidell, L. S. (1996). *Using multivariate statistics* (3rd ed.). New York: Harper Collins.
- Tardif, T. Wang, L., & Olson, S. (2009). Culture and the development of regulatory competence. Chinese-US comparisons. In S. Olson & A. Sameroff (Eds.), *Biopsychosocial regulatory processes in the development of childhood behavioral problems*. Cambridge: Cambridge University Press.
- Trentacosta, C. J., Hyde, L. W., Shaw, D. S., Dishion, T. J., Gardner, F., & Wilson, M. (2008). The relations among cumulative risk, parenting, and behavior problems

during early childhood. *Journal of Child Psychology and Psychiatry*, 49, 1211-1219.

- Valiente, C., Eisenberg, N., Spinrad, T., Cumberland, A., Losoya, S. Reiser, M. Liew, J. (2006). The relations among parents' expressivity, children's effortful control and their problem behaviors: A four-year longitudinal study. *Emotion*, 6, 459-472.
- Williams, L. R., Degnan, K. A., Perez-Edgar, K. E., Henderson, H. A., Rubin, K. H., Pine, D. S., Steinberg, L., & Fox, N. A. (2009). Impact of Behavioral Inhibition and Parenting Style on Internalizing and Externalizing Problems from Early Childhood through Adolescence. *Journal of Abnormal Child Psychology*, 37, 1063-75.
- Winer, 1971. B.J. Winer , *Statistical Principles in Experimental Design* . , McGraw-Hill, New York (1971).
- Wyman PA; Cowen EL; Work WC; Parker GR. "Developmental and family milieu correlates of resilience in urban children who have experienced major life stress." *American journal of community psychology*. 1991; 19(3):405-26.

CHAPTER 2

CULTURE, MOTHER'S USE OF MENTAL STATE LANGUAGE AND CHILDREN'S EMOTION UNDERSTANDING: A LATENT GROWTH CURVE ANALYSIS

Abstract

The current paper uses latent growth curve modeling to examine longitudinal relations between mother's use of mental state language (MSL) and children's developing emotion-situation knowledge (ESK). Importantly, the study takes a cross-cultural approach and examines if culture would moderate the relationship between maternal references to mental state and children's trajectories of ESK. European American mothers ($N=71$) and immigrant Chinese mothers ($N=60$) participated in the study. MSL was assessed at Time 1 when children were three years of age, using a picture book reading task. ESK was assessed when children were 3, 3.5, and 4.5 years of age. Results indicated that, irrespective of culture, maternal references to MSL predicted children's concurrent emotion knowledge. However, culture moderated the role of mental state language on children's growth in ESK, such that immigrant Chinese children whose mothers used high levels of MSL benefited the most.

Introduction

A host of evidence now exists which suggest that children's understanding of emotions is heavily influenced by socialization practices (Denham, 1993; Dunn, Bretherton, & Munn, 1987; Dunn, Brown, & Beardsall, 1991; Eisenberg, Cumberland, & Spinrad, 1998). In particular, mother-child conversational interactions appear to serve as the context in which children learn to understand situations that may elicit feelings and how emotions may influence behavior (for a review see Harris, 1999). Within this context, researchers have emphasized mothers' use of mental state language as a mechanism by which children come to understand, represent, and reason about psychological states (for reviews see Carpendale & Lewis, 2004; Symons, 2004). Specifically, recent research has found that parents who discuss mental states such as emotions, thoughts, and desires have children with better social cognitive abilities, including theory of mind (Ruffman, Slade, & Crowe, 2002) and emotion understanding (Taumoepeau & Ruffman, 2006). However, most of these studies have been concurrent in nature, thus making it difficult to assess causality. Furthermore, the majority of the supportive evidence comes from research with children in the early stages of development (roughly around 24-36 months), when the acquisition and expression of mental state terms are just beginning to emerge (Bartsch & Wellman, 1995). Interestingly, studies examining associations between mental state language and children's social cognitive abilities in children during the later preschool years appear much more inconclusive (see Ontai, & Thompson, 2008; LaBounty, Wellman, Lagatutta, & Liu, 2008). Another limitation of previous research is the lack of cross-cultural participants. To the best of our knowledge, no research has examined the longitudinal role that culture may play in children's understanding of emotions, despite evidence demonstrating cultural differences in mother-child conversations (Wang, 2001; Fivush & Wang, 2005; Wang & Fivush, 2005), as well as in attitudes

and beliefs towards emotions (Markus & Kitayama, 1991; Potter, 1988). The purpose of the current study is to examine concurrent and longitudinal associations between mothers' use of mental state language and children's developing emotion-situation knowledge (ESK). Secondly, we examine the extent to which culture may moderate these relationships.

References to mental state language and children's social emotional development.

In the context of mother-child conversations, the labeling of one's own mental states and the inquiry as to another's mental state suggest the importance of psychological states in attempting to understand another person. Mental state references may thus increase attention to these states as well as to their associations with the physical world (Dunn, Brown, Slomkowski, Tesla, & Youngblade, 1991; Ornstein, Haden, & Hedrick, 2004; Wellman, Harris, Banerjee, & Sinclair, 1995). Furthermore, in the context of conflicting emotions between the self and others, mental state terms offer multiple perspectives and different beliefs and causes for emotions as often discussed and explained by adults. This type of mother-child interaction may further facilitate children's theory of mind and emotional understanding (Harris, 1999). Finally, mental state language is significant in human communication because it focuses on the interpretation, evaluation, and motivation of an action or event (Dunn et al., 1987). It is a form of meaning-making that often has a strong emotional component (Wood & Conway, 2006) that helps facilitate the interpretation of a behavior or an intention, or the significance of an event to the self and to others (Rudek & Haden, 2005).

Some longitudinal research has demonstrated that early exposure to discussions of mental states contributes to children's emotional understanding (Dunn et al., 1991; Taumoepeau & Ruffman, 2006, 2008). In a study looking specifically at mental state language and children's emotion understanding, Taumoepeau and Ruffman (2006)

provided further evidence for the effects of maternal usage of mental state language on children's emotional understanding. In this study, mothers were asked to describe picture books to their children when children were 15 and 24 months old. Children's emotional understanding was assessed at the second time point by their ability to match emotional faces with a variety of affect-eliciting situations (e.g., a boy being chased by a lion) and by their ability to determine how a person was feeling by their body position. Mothers' references to desires predicted children's later usage of mental state terms, as well as children's emotional understanding. These effects were independent of children's language skills, family SES, and the mothers' performance on an emotion recognition task. In a follow-up study (Taumoepeau & Ruffman, 2008), the researchers visited the children at 33 months and found that mothers' references to thoughts and knowledge were a more consistent predictor of children's emotional understanding at this later age. The researchers suggested that mothers scaffold children's understanding of mind through their use of specific mental state terms, starting first with desires and progressing to cognitions when children's understanding of mental states were more nuanced.

There is also evidence to suggest that children's own use of mental state language mirrors their ability to represent and understand mental states. Olineck & Poulin-Dubois (2007) found for example that children's mental state language at 32 months to be correlated with children's later theory of mind abilities measured at 48 months. Contrary to expectation however, some recent studies have not found significant associations between references to mental states and children's social emotional abilities, suggesting that children's ability to use mental state language may be independent of their capacities to represent and to reason about those psychological states in others. For example, researchers who investigated mental states talk in a book narration task and in a friend description task with children 7-9 years of age found no

relation between their spontaneous use of mental state language and their performance on theory of mind, as measured by Happé's (1994) strange stories (Meins, Fernyhough, Johnson & Lidstone, 2006). These findings mirror previous research demonstrating no association between non-interactional mental state language and theory of mind performance (Charman & Shmueli-Goetz, 1998).

A host of studies—both within (Dunn et al., 1991; Ruffman et al., 2002; Taumoepeau & Ruffman, 2006, 2008) and across cultures (Doan and Wang, in press)—have underscored the importance of mother's references to mental state language to children's developing social cognition. Denham et al., (1994) found, for example, that mothers' use of emotion discourse predicts children's advanced identification of facial expressions and of emotion-eliciting situations. Mothers' use of empathy related language has also been found to be related to children's understanding of situational antecedents of emotion, independent of children's own use of emotion states language (Garner, Jones, Gaddy, & Rennie, 1997). In a recent study, however, researchers failed to find significant associations between children's theory of mind at 4.5 years of age and mothers' use of mental state language (Ontai & Thompson, 2008). LaBounty et al., (2008) measured both mothers' and fathers' use of mental state talk, operationalized as causal explanations of internal states in a story-book reading task, as well as children's theory of mind and emotion understanding. The majority of participants in this study were European Americans who were, on average, 20 months of age at Wave 1 and 68 months at Wave 2. Parental discourse was measured at Wave 1 and children's theory of mind and emotion understanding were measured at Wave 1 and Wave 2. Results of the study suggested that mothers' references to emotions and emotional causal explanatory language predicted children's concurrent emotion understanding abilities, independent of children's IQ and the father's discourse, but the positive association between mothers' mental state language and children's emotion

understanding failed to materialized longitudinally. At Wave 2, once IQ and children's Wave 1 emotion understanding abilities were entered into the model, none of the variables predicted children's emotion understanding at Time 2. Similarly, Jenkins, Turrell, Kogushi, Lollis, & Ross (2003), found that cognitive and feeling talk at Time 1 predicted younger (2 year old) children's mental state talk 2 years later, but NOT older children (4 year olds).

In sum, as data on parental discourse and children's social emotion abilities accumulated, the once consistent picture underscoring the role of maternal expressions of mental states in children's developing emotion and social competence began to dissolve. The previously reviewed research suggest that while concurrent associations are usually found in the early toddler years, these findings are often much more mixed longitudinally. Problems with previous research include the lack of data beyond one or two time points and the use of different measures of children's abilities across time. Having a minimum of three time points with the same measure would allow us to assess predictors of both current abilities, as well the growth of these competencies over time. Furthermore, past research has often failed to consider the role that culture may play in influencing these processes, thus limiting the generalizability of findings.

Culture, mental state language and emotion

At its core, mental state language serves as an expression of the individual's psychological contents. In essence, mental state language serves to express and affirm one's opinions, feelings, thoughts, and desires. Because the concept of the self is thought to vary across culture, there is reason to believe that cultural values and belief systems may influence the way in which mental state language is used. Specifically, one way in which cultures have been differentiated is on the continuum of independence and interdependence, a social orientation that refers to the degree to which individuals are encouraged to focus on themselves (i.e., independence) or on

other people (i.e., interdependence) (Marcus & Kitayama, 1991). Although both independence and interdependence can co-exist in any one culture (Mascolo & Li, 2004), different cultures prize and value different attributes (such as individuality versus communality) In turn, these cultural preferences influence how the self is socialized and, hence, constructed. This self-construal may play an important role in both the use of mental state language and children's developing emotion understanding. For example, in the context of an interdependent culture, an individual's emotions are often not highlighted; commonality and mutual consensus are more valued and personal expression of emotions may be socially divisive (Markus & Kitayama, 1991). Empirical research has shown that East Asians do tend to rely less on describing an individual and his behavior in the terms of psychological mental states. For example, East Asians are less likely to exhibit the fundamental attribution error (Morris & Peng, 1994), using more behavior-descriptive verbs rather than traits in person descriptions (Maas, Kurasawa, Politi, & Suga, 2006; Wang, 2004). Furthermore, East Asian children have been shown to justify another person's false beliefs by overt behaviors and social rules rather than by mental states (Naito & Koyama, 2006).

Similarly in the context of mother-child conversations, Wang and her colleagues demonstrated that European American mothers often made more comments on mental states and were more likely to refer to the child's personal needs, preferences, judgments, and opinions as compared to their Chinese American counterparts (Wang, Leichtman, & Davies, 2000). During memory sharing of emotional events, Chinese mothers were more likely to focus on behavioral norms and social expectations, while European American mothers were more likely to give causal explanations for feeling states (Fivush & Wang, 2005).

While few studies have systematically examined variation in children's use of mental state language, a seminal study comparing use of mental state terms in a Chinese and European American sample found that, while Chinese children's acquired desire terms earlier than their European American peers, they lagged behind in acquiring terms related to cognitions (Tardif & Wellman, 2000). One possibility for this cultural difference in children's acquisition of mental state terms may be due to differential input. Using a story-book reading task, Doan & Wang (in press) systematically examined references to mental states and behaviors in a sample of immigrant Chinese mothers and European American mothers. Results of their study showed that immigrant Chinese mothers made significantly less references to emotions and cognitions. Additionally, immigrant Chinese mothers were more likely to focus on describing the characters' behaviors. Across both cultures mental state language was concurrently associated with children's developing emotion knowledge. Finally, the ratio at which mothers referred to mental states versus behaviors mediated the cultural difference in children's emotion-situation knowledge.

The current study

In the current study, we used latent growth curve modeling to estimate the effects of mother's references to mental state language and to behaviors on children's developing emotion knowledge. Children were tested at the age of 3, 3.5, and 4.5. Past research has found more consistent associations between mental state language and children's social cognitive abilities in the early toddler years. Using this time period in latent growth curve modeling would allow us to test whether mental state language would predict emotion knowledge at the age of 3, as well as examine the growth of emotion knowledge over time. We utilized participants from both European American and immigrant Chinese backgrounds.

Methods

Design and Participants

Data collection took place at three time points. Children and their mothers came from a university town and suburban areas in upstate New York. The mean age was not significantly different across the two cultures (see Table 1). Children were recruited through local schools and by word of mouth, and were taking part in a larger longitudinal study of sociocognitive development across the preschool years. All children came from middle-class backgrounds, with the majority of the mothers (Chinese immigrant, 98%; European American, 93%) having obtained a college degree or beyond. Chinese immigrant families were originally from mainland China, Hong Kong, and Taiwan, with the majority from mainland China (93%). Most (80%) of the children were born in the U.S.

Procedure

Two female researchers visited mothers and children in their homes. Chinese-English bilingual researchers visited the Chinese immigrant families. The children were interviewed in the language with which they were most comfortable, most using a mixture of English and Chinese. For both cultures, before commencing with children's interviews, the researchers established familiarity and rapport with the children by chatting about non-relevant events. All materials were written in both English and Chinese, and translation and back-translation procedure was carried out to ensure their equivalence in both literal and sense meaning. Mothers were asked to engage the child in a series of free play and semi-structured tasks, followed by a researcher-child session. The entire home visit took approximately one and a half hours and was recorded on video tape. Only the tasks relevant to the current study are described here.

Measures

Mothers' references to mental state language. Mothers' use of mental state language and references to behaviors were assessed in a storytelling task at Time 1. Joint picture-book reading has been found to be a common practice among middle-class families in both European American and Chinese cultures (Johnston & Wong, 2002). Mothers received a book entitled "Bear Goes to the Market," a children's book with illustrations but no words. The storybook is 17 pages long and contains culturally neutral themes. It has been developed for and has been used in previous cross-cultural research with European American and Chinese samples (Han et al., 1998; Wang et al., 2000). The story depicted a mother bear and a baby bear dropping off mail, playing in a playground, and going to the grocery store (where the baby bear briefly loses his mother and gets upset, because he wants a cake and is not allowed to have it). Mothers were asked to tell the story with their children and to make up the text as they went along. They were also told that they could tell the story in any way they would like and could take as long as they wanted to complete the task. For Chinese mother-child dyads, time spent on the storytelling task ranged from 3.35 to 15.35 minutes ($M = 7.29$ minutes, $SD = 2.79$). For European American mother-child dyads, it ranged from 2.03 to 18.52 minutes ($M = 7.09$ minutes, $SD = 3.25$). There was no difference in the mean length of the storytelling between the two cultural groups.

Coding of the story narratives was done in the original language. A native English speaker coded the American data and a native Chinese speaker coded the Chinese data. Repeated training sessions were held to ensure that both coders were applying the same definitions of the coding scheme to the two datasets. A third coder, who was bilingual and fluent in both Chinese and English, independently coded 20% of each dataset for reliability. Any disagreements were resolved through discussion.

The coding scheme was adapted from Ruffman et al. (2002). Mothers' references to cognitions (e.g., think, know), desires (e.g., want, like, love), modulations of assertions (e.g., might, maybe), emotional states (e.g., sad, pleased), and other mental states (e.g., remember, decide) were separately tabulated. These references were then combined to form a composite category of mental state language. Coding for the Chinese data was further informed by research examining mental state language in Chinese children (Lu, Su, & Wang, 2008; Tardif & Wellman, 2000). Terms were counted as referring to mental states when the usage was judged, in context, to be indicative of desires (e.g., 要yao4), emotions (e.g., 生气sheng1qi4), cognitions (e.g., 想xiang3, 知道zhi1dao4), other mental states (e.g., 记得ji4de), and modulations of assertions (e.g., 可能ke2neng2). Terms that could be interpreted as behavior or mental states (e.g., 看kan4, equivalent to "see" in English, but may be understood as "think" in Chinese) were coded based on the context. Inter-coder reliability, as indexed by Cohen's kappas, ranged from .96 to 1 for the Chinese data ($M = .98$) and from .87 to .96 for the American data ($M = .93$).

Mothers' references to overt behaviors, including physical actions depicted in the book (e.g., running, playing) and potential actions that were not necessarily seen in the book (e.g., he's going to go home now) were coded as behavioral descriptions. Cohen's kappa was .83 for the Chinese data and .95 for the American data. This variable further included a subcategory of mothers' references to the behavioral/descriptive manifestations of emotions (e.g., "The bear is crying" and "aw, the bear has tears on his face"). Compared to references to internal emotional states (e.g., "The bear is sad"), behavioral descriptions of emotions focused on external or physical aspects of emotions (Ruffman et al., 2002). Cohen's kappa for this subcategory was .98 for the Chinese data and .87 for the American data.

Language ability. Mothers filled out a shortened version of the Child Development Inventory (Ireton, 1992) that assessed children's language skills at all three time points. Both expressive language and language comprehension were assessed (possible score range 0-100; Cronbach's $\alpha = .93$). The questionnaire was translated and back-translated by two English-Chinese bilingual research assistants and checked by a native Chinese speaker in order to ensure a balance of literal and sense meaning, as well as natural-sounding expression. English words and grammatical rules that were not used in Chinese were exchanged for the Chinese equivalents. The inventory was then pilot-tested with seven European American families and five Chinese immigrant families to ensure equivalence. Because children's expressive language score and language comprehension scores were highly correlated $r = .80, p < .0001$, they were combined for later analysis. The language measure was included because language ability has been shown to be related to the understanding of emotions and mental states (Happé, 1994).

Maternal education level. As a measure of socioeconomic status, maternal education was coded on a 3-point scale: 1 = high school qualification, 2 = four-year college degree, 3 = postgraduate degree.

Children's emotion knowledge. Children's emotion knowledge was assessed at all three time points, using an emotion production task adapted from previous cross-cultural research examining children's ability to understand situations that provoke various emotions (Harris et al., 1987). This task has been used with European American and Chinese preschoolers (Wang et al., 2006; Wang, 2008) and has been shown to be effective in eliciting children's responses regarding the situational antecedents of emotions. Children were asked to describe situations likely to provoke fearful, sad, angry, and happy emotions. The researcher presented each term to the child and asked the child to describe situations that would elicit such an emotion in

people (e.g., “What makes people feel sad?”) and in the child (e.g., “What makes you feel sad?”). For each question, the researcher prompted the child to provide as many situations as possible (e.g., “What else makes people feel sad?”) until the child indicated that he or she was finished. The researcher rewarded children with stickers to motivate them to come up with as many situations as possible. This task took approximately 10 minutes.

The number of responses children provided was tallied. Responses were considered correct if the situation described by the child was judged to be able to elicit the presented emotion (e.g., “What makes you feel happy?” “My teddy bear”). This included situations that would elicit the emotion in a child but not necessarily in an adult. In both cultural groups, responses provided by children were mostly correct. Incorrect responses were rare; on average, there was less than one incorrect response per group. On the other hand, not all children could provide a correct response to every emotion. In a few cases, children randomly named objects in the room (e.g., “What else makes people feel happy?” “Table, chair, cup...”), and these responses were not coded. Children’s correct responses for each of the four emotions were tallied and summed to form a composite score of emotion-situation knowledge (ESK). A second research assistant coded 20% of the data for reliability. The average kappas were .87 (.71–1) for Chinese immigrant children and .87 (.66–1) for European American children.

Results

To examine the relations between mother’s use of mental states and children’s concurrent and longitudinal ESK, latent growth curve (LGC) models were estimated in Mplus 5.2 (Muthén & Muthén, 1998–2007). LGC modeling, a powerful technique used to analyze data in a repeated measures design, treats change over time as an underlying latent process. Instead of examining group means, LGC establishes a

trajectory of change over time for each individual. Characteristics of this trajectory (e.g. intercept and slope) are allowed to vary across individuals, thus both fixed effects (average slope for the group) and random effects (individual differences within groups) are estimated.

LGC modeling has several advantages over conventional techniques such as repeated measures analysis of variance (RM-ANOVA). LGC models allow for a more complete picture of the change process by allowing one to estimate parameters of change including linear and non-linear effects, as well as their variances and covariances. In addition, LGC estimates are not attenuated because measurement error is teased out, and they are not restricted to the compound symmetry or sphericity assumptions of RM-ANOVAs. Finally, unlike traditional RM-ANOVA programs, LGC does not use list-wise deletion of missing data but employs an approach known as full information maximum likelihood (FIML). In FIML, all the available data for each person is used in obtaining a likelihood function for that person, which is then summed across persons, allowing LGC models to incorporate missing observations and unequally spaced observations across individuals.

For this study, unconditional models will first be conducted on ESK. We expect ESK to have a linear trajectory, such that across all cultures, ESK should improve over time. Next, mothers' use of mental state language and references to behaviors at Time 1 will be examined as the independent predictor of both the slope and the intercept of children's ESK (along with relevant control variables). Since language ability was measured at all time points, it will be included as a time varying covariate. In addition to these factors, the intercept will be added as a predictor of the slope. Controlling for initial levels on the growth not only ameliorates the problem of regression to the mean and ceiling effects but also partials out the effects of initial status, such that the covariates in the model are predicting variance left in the slope

after controlling for the effects of the intercept (Seltzer, Choi & Thum, 2003; Choi, Seltzer, Herman, & Yamashiro, 2007).

Finally, interactions terms will be added to the model in order to examine whether the relationship between maternal discourse and children's ESK differs across cultures.

Preliminary analyses

Language scores (Ms = 77.38, 86.43, 94.61, SDs = 15.11, 11.87, 6.73) were significantly correlated with ESK scores at Time 2 and Time 3 (age 3: $r = .27$, $p = .002$; age 3.5: $r = .27$, $p = .002$). Gender was not associated with children's ESK; however, females had higher levels of language ability at all three time points (age 3: $t(128)=2.61$, $p = .01$; age 3.5: $t(121)=2.99$, $p = .003$; age 4.5: $t(104)=2.05$, $p = .042$). Language and gender, thus served as covariates for all analyses. Age was not associated with children's ESK at any of the time points. Mothers' education and time spent on task showed no significant effects in preliminary analyses; thus, these variables were no longer considered in further analyses.

Because we are interested in the sheer amount of exposure to mental state terms, and since because previous research on mother-child interaction has shown that compared with proportion, frequencies are more predictive of child outcomes (e.g., Fivush, 1988; Han et al., 1998; Reese et al., 1993). Additionally, because each utterance potentially has a direct bearing on children's understanding of mental states, as it provides additional input (Ruffman et al., 2002), and to be consistent with previous research (Doan & Wang, in press) we used frequencies in our analyses. Degrees of freedom varied slightly across analyses, as not all children participated in all tasks.

To ensure that the number of maternal references to mental states and to behaviors did not simply reflect overall maternal involvement or verbosity and, hence, inadvertently contribute to children's ESK, we examined the sum of behavioral and

mental states references ($M = 63.28$, $SD = 27.08$) as well as the total amount of time spent on the storytelling task ($M = 7.18$, $SD = 3.04$), in relation to children's ESK. Results revealed no significant correlation between either the sum of references ($r = .10$, $p = .26$) or the total time spent on the task ($r = .09$, $p = .29$) and children's ESK, thus ruling out the possibility that the overall linguistic input was influencing children's ESK. In addition, there was no significant cultural difference in mothers' total references to mental states and behaviors combined (EA: $M = 66.43$, $SD = 29.01$; Chinese: $M = 59.49$, $SD = 25.26$), $F(1, 128) = 2.14$, $p = .15$, nor in the amount of time mother-child pairs spent on the storytelling task (EA: $M = 7.02$, $SD = 3.15$; Chinese: $M = 7.30$, $SD = 2.79$), $F(1, 128) = .38$, $p = .50$.

Descriptives and inter-correlations

There were significant cultural differences in relation to maternal references to mental states $t(128) = 7.79$, $p < .001$. European American mothers ($M = 29.76$, $SD = 18.11$) used more mental state language than immigrant Chinese mothers ($M = 10.25$, $SD = 7.12$). Immigrant Chinese mothers made more references (EA: $M = 36.68$, $SD = 14.60$; Chinese: $M = 49.23$, $SD = 20.45$) to behaviors, $t(128) = 4.04$, $p < .001$. Significant differences were also found as well as in children's ESK scores at Time 1, $t(129) = -7.961$, $p < .001$, and time 2, $t(120) = -4.15$, $p < .001$. At Time 3, the culture difference in children's ESK was no longer significant $t(103) = -1.80$, $p = .075$. Next, zero-order correlations were calculated across all study variables. Mental state language was positively associated with children's ESK at age 3 and 3.5 while references to behavior were negatively associated with ESK at Time 1 and Time 2. Language ability at each time point was positively associated both concurrently and longitudinally with children's emotion ability. The correlation table can be requested from the first author.

Unconditional models

A latent growth factor (LGF) analysis was used to investigate change in children's emotion knowledge and to test whether growth in children's ESK was related to mothers' discourse variables, and to see if the effects of this discourse varies across cultures. A baseline unconditional LGF model of children's ESK was fit from children's scores at each time point. The time scores for the slope growth factors were fixed at 0, .5, and 1.5 (reflecting time of initial data collect, then 6 months, and 18 months after). The intercept and slope growth factors were allowed to co-vary. The unconditional model was found to fit the data well, $\chi^2(1, N= 131) = .264, p = .607$, comparative fit index (CFI) = 1, Tucker Lewis index (TLI) = 1.04, root-mean square error of approximation (RMSEA) = .662. The average intercept ($M = 9.289, p < .001$) and average slope ($M=7.513, p < .001$) were significantly different from zero, indicating that children's emotion knowledge significantly increased over time. Figure 2.1 depicts the fitted lines for each culture group.

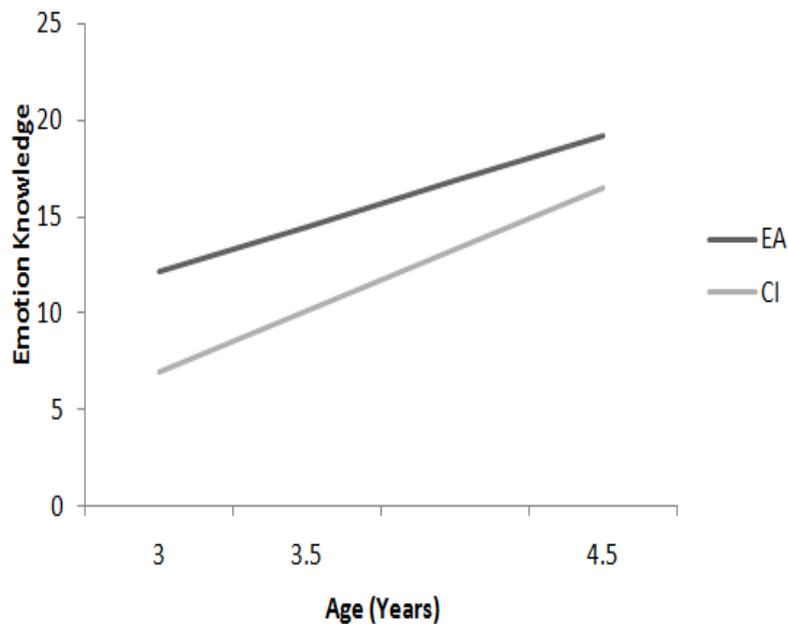


Figure 2.1 *Fitted lines for emotion knowledge across groups.*

Growth Analysis

Two conditional LGF models were fit with the data to test whether the between-person variation in growth parameters in the unconditional baseline model was related to variation in the predictors. Table 2.4 summarizes the results of the unconditional, main-effects and final interaction models. In the main effects model, culture and maternal references to behaviors and to mental states were included as predictors of the intercept and the slope, gender and culture served as time invariant covariates and language was included as time varying covariate.

Table 2.1 *Estimates for Latent Growth Model for Children's Emotion Situation*

Knowledge.

	<i>Unconditional model parameter estimate (SE)</i>	<i>Main effects model parameter estimate (SE)</i>	<i>Interaction model parameter estimate (SE)</i>
<i>Initial status</i>			
Intercept	9.35(.76)***	12.681(1.194)***	12.22(1.24)***
Culture	-	-5.13(1.89)**	-5.37(1.90)**
Gender	-	-1.78(1.24)	-1.78(1.24)
Behavior references		-2.10(.76)**	-2.12(.78)**
Mental state language	-	2.70(.90)**	3.32(1.09)**
CulturexMSL	-	-	-1.59(1.54)
<i>Linear change</i>			
Intercept	7.67(.90)	8.23(3.79)*	8.08(4.08)*
Culture	-	3.31(2.82)	4.29(2.95)
Gender	-	-.17(1.7)	.07(1.71)
Behaviors references		-1.01(1.21)	-.81(1.24)
Mental state language	-	.53(1.45)	-1.23(1.79)
CulturexMSL	-		4.44(2.29)*

Note. Culture and gender are dummy coded, such that European American and females represent the reference group. All other predictors are standardized, * $p < .05$; ** $p < .01$, *** $p < .001$.

This model fit the data well $\chi^2 = (11, N = 131) = 9.389, p = .5861, CFI = 1, TLI = 1.032, RMSEA = .80290, C.I. 0.000 - 0.081$. Culture, mental state language, and behaviors were significant predictors of the intercept. None of the variables significantly predict variations in the slope. In the next model, interaction terms between culture and mothers' mental state language were computed and added to the model. This model also fit the data, $\chi^2 = (13, N = 131) = 11.619, p = .5591, CFI = 1, TLI = 1.026, RMSEA = .80, C.I.: 0.000 - 0.079$. The culture by mental state interaction term was significant, suggesting that the effects of mental state language on the growth of emotion knowledge were moderated by culture (see Figure 3). Further models were explored, and demonstrated that no other interactions (including culture x behavior references) reached significance.

Discussion

Understanding emotions and their situational antecedents are crucial to navigating social relationships, as well as to regulating one's emotional well-being. One factor that has been shown to be pivotal in children's developing emotion understanding is the extent to which mothers refer to mental states in conversations with children. However, there is evidence to suggest cultural differences in the prevalence of mental state language as well as in the specific time period in which mental state references are useful in aiding children's developing social cognitive abilities. The current study examines mother's use of mental state language and children's ESK in a longitudinal, cross-cultural context. Latent growth curve models demonstrated significant cultural differences with regards to both emotion understanding at age 3 (Time 1) and trajectories of emotion understanding over time. European American children start with higher emotion understanding but did not increase significantly faster than their immigrant Chinese counterparts. Mothers' references to mental state language predicted children's emotion understanding at age

3 across both European American and immigrant Chinese children. However, when examining individual variances in the *growth* of emotion-situation knowledge, immigrant Chinese children benefit the most from mother's frequent use of mental state language.

Consistent with previous research we found that Chinese mothers made fewer references to mental states (Doan & Wang, in press). This is consistent with the idea that individual realities, emotions and thoughts may not be as salient in interdependent cultures (Markus & Kitayama, 1991; Potter, 1998). On the other hand, the emphasis on behaviors suggests that for immigrant Chinese, it's one's actions, that may be more pivotal in understanding an individual.

An important finding from the current study is that maternal references to mental state language had a stronger association with Chinese children's growth in emotion knowledge over time. There is evidence to suggest that while the development of mental state terms is consistent across cultures (desire terms are acquired first, followed by emotion terms, then cognitive terms), Chinese children lag behind (Tardif & Wellman, 2000). This lag has also been found for theory of mind acquisition (REF). References to mental states may be particularly useful during the period of development in which children's expression and understanding of mental state terms are beginning to emerge. It is possible that European American children past the age of 3.5, the benefits of mental state language may have in essence been saturated.

It is likely that as children began to develop a more nuanced understanding of social cognition, merely labeling the terms no longer assists growth. On the other hand, as children's social emotional ability develops, more complex aspects of mother-child discourse, specifically discourse that moves beyond the mere labeling of internal states to elaboration and explicit explanations of casual relationships between

psychological states and behaviors, as well as situations and psychological states, might play a more influential role for children. As a case in point, Ontai & Thompson (2008) found that in the context of mother-child memory sharing, maternal elaborations, or statements that move the conversation to a new aspect or adds more details, predicted theory of mind but not maternal references to mental states. Similarly, in examining both theory of mind and emotion understanding, LaBounty et al. (2008) found a similar pattern of results for fathers' causal talk, though it did not reach significance when examined longitudinally. Future research examining children's emerging social emotion abilities would benefit greatly by looking specifically at both the content and the style of mother-child discourse, as well as the age or social emotion ability of the child, in order to examine interactions between types of maternal discourse style and children's development.

In the current study, we only measured references to mental state language at one time point and were thus unable to assess whether mothers' use of MSL increased over time or how this development would parallel the development of children's development emotion knowledge. However, research has shown that mothers tend to be consistent with their mental state language usage (Rudek & Fivush, 2005). It would be more informative to see whether the effects of acculturation on immigrant Chinese mothers would influence their use of mental state terms. Theoretically, as immigrants become more acculturated with a culture and began to adopt the cultures norms and values, they would be more likely to adopt the cultural behaviors as well. Additionally, research examining cross-cultural differences in emphasis on mental states versus behaviors would benefit greatly by measuring the variable of interest for which culture is acting as a proxy. For example, within a culture, are those who score high on interdependence measures be less likely to use mental state language? Would

this depend on context (e.g. talking with a person of the same or different ethnic group)?

Furthermore, despite including longitudinal analyses, our data are correlational in nature, thus causal direction must be interpreted with caution. It is possible that children with higher ESK would be more likely to elicit more references to mental states from their mothers. However, this is unlikely due to research indicating that mothers' use of mental state language is not influenced by children's characteristics (Garrett-Peters, Mills-Koonce, Adkins, Vernon-Feagans, & Cox, 2008). Furthermore, children's use of mental state language has not been found to be correlated with mother's references to mental states (Ruffman, et al., 2002). Experimental studies manipulating children' mental state input found that references to mental state language improve children's theory of mind (Guajardo & Watson, 2002). These studies, in addition to research measuring maternal references to mental state language when children were pre-verbal (Meins, Fernyhough, Wainwright, Das Gupta, Fradley, & Tuckey, 2002) suggest that the effects are not child-driven.

In sum, findings from the current study suggest the importance of culture as well as trajectories of children's developing EK over time in order to examine the precise nature of effects of mental state language on children's social cognitive development.

REFERENCES

- Bartsch, K., & Wellman, H.M. (1995). *Children talk about the mind*. Oxford, UK: Oxford University Press.
- Carpendale, J. & Lewis, C. (2004). Constructing an understanding of mind: The development of children's social understanding within social interaction. *Behavioral and Brain Sciences*, 27, 79-151.
- Charman, T., & Shmueli-Goetz, Y. (1998). The relationship between theory of mind, language and narrative discourse: An experimental study. *Current Psychology of Cognition*, 17, 245-271.
- Choi, K., Seltzer, M., Herman, J. & Yamashiro, K. (2007). Children left behind in AYP and non-AYP schools: Using student progress and the distribution of student gains to validate AYP. *Educational Measurement: Issues and Practice*, 26, 3, 21-32.
- Denham, S. A. (1993). Maternal emotional responsiveness and toddlers' social-emotional competence. *Journal of Child Psychology and Psychiatry*, 34, 715-728.
- Denham, S., Zoller, D. & Couchod, E. (1994). Socialization of preschoolers' emotion understanding. *Developmental Psychology*, 30, pp. 928–936.
- Doan, S. N., & Wang, Q. (in press). Maternal discussions of mental states and behaviors: Relations to emotion situation knowledge in European American and immigrant Chinese children. *Child Development*.

- Dunn, J., Bretherton, I., & Munn, P. (1987). Conversations about feeling states between mothers and their young children. *Developmental Psychology, 23*, 132-139.
- Dunn, J., Brown, J., & Beardsall, L., (1991). Family talk about feeling states and children's later understanding of others' emotions. *Developmental Psychology, 27*, 448-455.
- Dunn, J., Brown, J., Slomkowski, C., Tesla, C., & Youngblade, L. (1991). Young children's understanding of other people's feelings and beliefs: Individual differences and their antecedents. *Child Development, 62*, 1352-1366.
- Eisenberg, N., Cumberland, A., & Spinrad, T. (1998). Parental socialization of emotion. *Psychological Inquiry, 9*(4), 241-273.
doi:10.1207/s15327965pli0904_1.
- Fivush, R. (1998). Interest, gender and personal narrative: How children construct selfunderstanding. In A. Karp, A. Renninger, J. Baumeister & L. Hoffman (Eds.) *Interest and gender in education*. (pp. 58-73). Kiel, Germany: Institute for Science Education.
- Fivush, R., & Baker-Ward, L. (2005). The search for meaning: Developmental perspectives on internal state language in autobiographical memory. *Journal of Cognition and Development, 6*, 455-462.
- Fivush, R. & Wang, Q. (2005). Emotion talk in mother-child conversations of the shared past: The effects of culture, gender, and event valence. *Journal of Cognition and Development, 6, 4*, 489-506.

- Garner, P. W., Jones, D. C., Gaddy, G., & Rennie, K. M. (1997). Low-income mothers' conversations about emotions and their children's emotional competence. *Social Development*, 6, 37-52.
- Garrett-Peters P., Mills-Koonce, R., & Adkins, D. Vernon-Feagans, L. & Cox, M. (2008). Early environmental correlates of maternal emotion talk . *Parenting*, 8, 117 - 152.
- Guajardo, Nicole R., and Watson, Anne C. (2002), "Narrative Discourse and Theory of Mind Development," 163, 305-325.
- Han, J. J., Leichtman, M. D. & Wang, Q. (1998). Autobiographical memory in Korean, Chinese, and American children. *Developmental Psychology*, 34, 4, 701-713.
- Happé, F. G. (1994). An Advanced Test of Theory of Mind: Understanding of Story Characters' Thoughts and Feelings by Able Autistic, Mentally Handicapped and Normal Children and Adults. *Journal of Autism and Developmental Disorders*, 24, 129-154.
- Happé, F.G. (1995), "The role of age and verbal ability in the theory of mind tasks performance of subjects with autism", *Childhood Development*, 66, 843 - 855.
- Harris, P.L., Olthof, T., Terwogt, M. & Hardman, C., (1987). Children's knowledge of the situations that provoke emotion. *International Journal of Behavioral Development*, 10, 319-343.
- Harris, P. L. (1989). *Children and emotion*. Cambridge University Press, New York.
- Ireton, H. (1992). *Child development inventory*. Minneapolis, MN: Behavioral Science Systems.

- Jenkins, J., Turrell, L., Kogushi Y., Lollis, S., & Ross H. (2003). A longitudinal investigation of the dynamics of mental state talk in families. *Child Development, 74*, 905-920.
- Johnston, J. & Wong, A. (2002). Cultural differences in beliefs and practices concerning talk to children. *Journal of Speech, Language, and Hearing Research, 45*, 916-926. doi:10.1044/1092-4388(2002/074).
- La Bounty, J., Wellman, H. M., Olson, S., Lagattuta, K. H., & Liu, D. (2008). Mothers' and fathers' use of internal state language. *Social Development, 17*, 757-775.
- Lu, H., Su, Y., & Wang, Q. (2008). Talking about others facilitates theory of mind in Chinese preschoolers. *Developmental Psychology, 44*, 6, 1726-1736.
- Markus, H., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review, 98*, 224-253.
- Mascolo, M. F., & Li, J. (2004). The coactive construction of selves in cultures. In Mascolo, M. F., & Li, J. (Eds.). *Culture and developing selves: Beyond dichotomization. New Directions in Child and Adolescent Development Series*. W. Damon (Series Editor). San Francisco, CA: Jossey-Bass.
- Maas, A., Kurasawa, M., Politi, F., & Suga, S. (2006). Do verbs and adjectives play different roles in different cultures: A cross-linguistic analysis of person representation. *Journal of Personality and Social Psychology, 90*, 734-750.
- Meins, E., Fernyhough, C., Wainwright, R., Das Gupta, M., Fradley, E., & Tuckey, M. (2002). Maternal Mind-Mindedness and attachment security as predictors of Theory of Mind understanding. *Child Development, 73*, 1715-1726.

- Meins, E., Fernyhough, C., Johnson, F. & Lidstone, J 2006. Mind-mindedness in children: Individual differences in internal-state talk in middle childhood. *British Journal of Developmental Psychology*, 24, 181-196.
- Morris, M. W., & Peng, K. (1994). Culture and cause: American and Chinese attributions for social and physical events. *Journal of Personality and Social Psychology*, 67, 949-971.
- Muthén B., Muthén L. (1998-2007). *Mplus Software. The Comprehensive Modeling Program for Applied Researchers User's Guide*. Los Angeles: Muthén & Muthén.
- Naito, M. & Koyama, K. (2006). The development of false-belief understanding in Japanese children: Delay and difference? *International Society for the Study of Behavioral Development*, 30, 290-304.
- Olineck, K., & Poulin-Dubois, D. (2007). Imitation of intentional actions and internal state language in infancy predict preschool theory of mind skills. *European Journal of Developmental Psychology*, 4, 14-30.
- Ontai, L.L., & Thompson, R.A. (2002). Patterns of attachment and maternal discourse effects on children's emotion understanding from 3 to 5 years of age. *Social Development*, 11(4), 433-450.
- Ornstein, P. A., Haden, C. A., & Hedrick, A. M. (2004). Learning to remember: Social-communicative exchanges and the development of children's memory skills. *Developmental Review*, 24, 374-395.
- Potter, S. H. (1988). The cultural construction of emotion in rural Chinese social life. *Ethos*, 16, 181-208.

- Reese, E., Haden, C., & Fivush, R. (1993). Mother-child conversations about the past: Relationships of style and memory over time. *Cognitive Development, 8*, 403-430.
- Ruffman, T., Slade, L., & Crowe, E. (2002). The relation between children's and mother's mental state language and theory-of-mind understanding. *Child Development, 73*, 734-751.
- Rudek, D.J., & Haden, C. A. (2005). Mother's and preschooler's mental state language during reminiscing over time. *Merrill-Palmer Quarterly, 51*, 523-549.
- Seltzer, M., Choi, K. & Thum, Y.M. (2003). Examining relationships between where students start and how rapidly they progress: Using new developments in growth modeling to gain insight into the distribution of achievement within schools. *Educational Evaluation and Policy Analysis, 25*, 263-286.
- Symons, D. (2004). Mental state discourse, theory of mind, and the internalization of self-other understanding. *Developmental Review, 24*, 159-188.
- Taumoepeau, M., & Ruffman, T. (2006). Mother and infant talk about mental states relates to desire language and emotion understanding. *Child Development, 77*, 465-481.
- Taumoepeau, M., & Ruffman, T. (2008). Stepping stones to other's minds: maternal talk relates to child mental state language and emotion understanding at 15, 24, and 33 months. *Child Development, 79*, 284-302.
- Tardif, T., & Wellman, H. (2000). Acquisition of mental state language in Mandarin and Cantonese speaking children. *Developmental Psychology, 36*, 25-43.

- Wang, Q. (2001). "Did you have fun?": American and Chinese mother-child conversations about shared emotional experiences. *Cognitive Development, 16*, 693-715.
- Wang, Q. (2004). The emergence of cultural self-construct: Autobiographical memory and self-description in American and Chinese children. *Developmental Psychology, 40, 1*, 3-15.
- Wang, Q. (2008). Emotion knowledge and autobiographical memory across the preschool years: A cross-cultural longitudinal investigation. *Cognition, 108*, 117-135.
- Wang, Q. & Fivush, R. (2005). Mother-child conversations of emotionally salient events: Exploring the functions of emotional reminiscing in European American and Chinese Families. *Social Development, 14, 3*, 473-495.
- Wang, Q., Leichtman, M. D., & Davies, K. I. (2000). Sharing memories and telling stories:
American and Chinese mothers and their 3-year-olds. *Memory, 8, 3*, 159-177.
- Wang, Q., Leichtman, M. D., & White, S. H. (1998). Childhood memory and self-description in young Chinese adults: The impact of growing up an only child. *Cognition, 69, 1*, 73-103.
- Wang, Q., Hutt, R., Kulkofsky, S., McDermott, M., & Wei, R. (2006). Emotion situation knowledge and autobiographical memory in Chinese, immigrant Chinese, and European American 3-year-olds. *Journal of Cognition and Development, 7, 1*, 95-118.

Wellman, Harris, Banerjee, Wellman, H., Harris, P. L., Banerjee, M., & Sinclair, A. (1995). Early understanding of emotion: Evidence from natural language. *Cognition and emotion, 9*, 117-149.

Wood, W., & Conway, M. (2006). Subjective impact, meaning making, and current and recalled emotions for self-defining memories. *Journal of Personality, 74*, 811-846.

CHAPTER 3

CULTURE MODERATES RELATIONS BETWEEN EMOTION KNOWLEDGE AND CHILDREN'S INTERNALIZING PROBLEMS

Abstract

The current paper examines in a cross-cultural context, longitudinal relations between children's emotion knowledge (EK) and internalizing problems. Children's EK, measured at 3.5 years of age, was assessed using a task design to elicit their understanding of situational antecedents of discrete emotions, mothers' reported on children's behavior problems using the BASC at 7 years of age. Results of the student suggest that children's EK is associated with children's internalizing problems. Furthermore, the relationship between EK and internalizing problems is moderated by culture, such that EK was only negatively associated with internalizing problems for European American children. The importance of culture in affecting both theory and intervention programs relating children's adjustment is discussed.

Introduction

Research in the past decade has underscored the importance of emotion knowledge as an important correlate for a range of adaptive abilities including social competence, academic outcomes and psychological adjustment (for a recent meta-analysis see Trentacosta & Fine, 2010). The majority of this research has focused mainly on a specific aspect of emotion knowledge, specifically discrete emotion knowledge, the ability to understand relatively unambiguous cues of individual emotions expressed in traditional channels such as facial expression, vocalizations or social situational contexts (Izard, 2001). Arguably, this form of emotion knowledge, which involves perception and labeling, is the cornerstone for more complex aspects of emotion understanding, including knowledge of mixed emotions, self regulation

and displays rules. Emotion knowledge as defined, is considered a critical aspect of emotional intelligence and competence (Mayer & Salovey, 1997; Saarni, 1999). Evidence demonstrating that emotion knowledge is associated with a host of positive outcomes has influenced psychotherapeutic interventions (Kendall, Aschenbrand, & Hudson, 2003) as well as spurred training programs designed to improve children's emotion recognition skills (Greenberg, Kusche, Cook, & Quamma, 1995; Izard et al., 2008).

This body of research however has been limited in that it has focused on children mainly from European American backgrounds and have ignored the role that culture may play in moderating the relationship between children's emotion knowledge and outcomes. A tacit assumption has generally been made that heightened sensitivity to emotional contexts is beneficial. However, there is a large body of literature documenting cultural differences in emotion valuation, expression, and socialization (Argyle, Henderson, Bond, Lizuka, & Contarello, 1986; Potter, 1988; Russell & Yik, 1996; Zheng & Berry, 1991), as well as major theoretical perspectives arguing that psychological adjustment is predicted by the *goodness-of-fit* between individual characteristics and cultural norms (Caldwell-Harris & Ayçiçeği, 2006; Kristof, 1996; Lerner, 2002; Ward & Bochner, 2001). In the current study, we test the hypothesis that culture would moderate the effects of emotion knowledge on children's adjustment.

Emotion knowledge and children's adjustment

One of the cornerstones of the emotional development research is the idea that adaptive individual and social competence necessitates the acquisition of the ability to recognize emotion signals (Campos & Barrett, 1984; Denham, 1998; Saarni, 1999). The ability to grasp and understand emotional stimuli as well as their antecedents and consequences is crucial for developing social relations, as well as being constructive

towards the development of one's own emotion regulation competencies (Chicchetti, Ackerman, & Izard, 1995; Denham, Zoller, & Couchod, 1994; Greenberg, Kusche, Cook & Quamma, 1995). Furthermore, in independent cultures, where the self is viewed as autonomous and independent of the social environment (Geertz, 1984; Triandis, 1989), personal emotion is a critical component of experience, serving as a salient indicator of one's relationship with the environment and social world (Halberstadt, Denham & Dunsmore; Potter, 1998). Moreover, individual internal attributes such as emotions, preferences and beliefs should be cultivated (Markus & Kitayama, 1991), as well as be in-line with one's behaviors (e.g. Kashima, Siegal, Tanaka, & Kashima, 1992). Finally, because an individual's subjective emotional experience is considered more diagnostic of the true self than behaviors (Andersen, 1984; Andersen & Ross, 1984), emotion signals serve as information (Clore, Schwarz, & Conway, 1994; Schwarz, 1990; Schwarz & Clore, 1988) in which one can use to understand the current state of the self (Schwarz & Clore, 1983), to make meaning of ongoing experience (Clore & Parrott, 1994), as well as to ascertain the quality of social relationships (Batson, Turk, Shaw, & Klein, 1995).

Consistent with these theoretical perspectives and findings, research examining correlates of emotion understanding with youth have found that children with higher levels of EK are more empathetic, have higher levels of pro-social behaviors and are more popular among their peers (Denham, 1986; Denham & Couchoud, 1991; Denham, McKinley, Couchoud, & Holt, 1990; Dunn & Brown, 1994; Dunn, Brown & Maguire, 1995). A host of evidence also suggests that emotional competence is key to understanding mental health (Dadds, Sanders, Morrison, & Rebetx, 1992; Denham, et al., 2000). Childhood psychopathology can often be characterized by emotional dysregulation (Cicchetti et al., 1995), and emotion-related concepts often predict the continuity of behavior problems (Robins & Rutter, 1990; Werner, 1989). Disruptions

in emotional competence, may have direct effects on children's behavioral problems, as well as indirect effects through decreasing the quality of familial and peer relations (see Denham, 2008).

In a study exploring concurrent relations between children's EK and social functioning, researchers assessed children's EK using both an emotion recognition task and an emotion situation knowledge task (Schultz, Izard, Ackerman, & Youngstrom, 2001). In the emotion recognition task, children were presented with photographs of prototypical facial expressions of emotion and ask the children to identify the emotion. In the emotion situation knowledge task, children were presented with 18 stories with an emotionally laden context. Children were asked to label the emotion felt by the protagonist in the story. Children's social functioning which included items such as rejection by peers, feelings of social isolation, as well as children's social withdrawal were assessed based on teacher's report using the CBCL-TRF (Achenbach, 1991). Additionally, children's verbal ability, attentional control and behavioral control were measured and controlled for. Results of the study demonstrated that emotion situation knowledge significantly predicted both children's social functioning and withdrawal, showing that children with higher levels of emotion situation knowledge were more social competent and less likely to withdraw from peers. Identification of emotion expression showed similar relations but weaker effects.

In another longitudinal study that examined relations between children's EK and children's self-reported internalizing problems, Fine and her colleagues assessed children's EK in first grade. Furthermore, teacher reports of children's internalizing and externalizing problems (Fine, Izard, Mostow, Trentacosta, & Ackerman, 2003) were also collected. Children's internalizing problems were also measured in 5th grade, 4 years later. Multiple regression analyses demonstrated that while early teacher reports of children's externalizing problems as well as their emotion knowledge scores

in first grade, significantly explained children's report of internalizing in fifth grade. Externalizing problems may directly affect children's internalizing in multiple ways. Children who act out and have less behavioral control, typical of externalizing characteristics, may be more likely to be rejected by peers, as well as having less successful social interactions. These social difficulties may in turn lead children to become depressed, anxious as well as to withdraw from further social interactions. Interestingly, children's early reports of internalizing problems were not associated with later internalizing problems, perhaps due to the long time span between the two time points. Moreover, the authors argue that because externalizing behaviors include overt reactions, teacher's report of externalizing may be more accurate than their report of children's internalizing problems. In sum, the literature on children's EK and children's internalizing problems has suggested that children with higher levels of EK tend to have lower levels of internalizing problems.

One major limitation of the previous research is the implicit assumption that children's development occurs in an environment where individual characteristics and cultural values match up. Specifically, this body of literature has mainly focused on European American children who grow up in a context, where emotions (especially positive ones) are valued and considered an important indicator of one's personal disposition as well as evaluative of ongoing social interactions (Fiske, Kitayama, Markus & Nisbett, 1998; Markus & Kitayama, 1991; Potter, 1998). In more interdependent societies, where situational factors such as norms, roles and obligators are bigger determinants of behavior, and where emotions are often undermined or considered negative, we might expect that the relations between EK and adjustment might be non-existent or even negative.

Culture, Emotion and Fit

In predicting an individual's outcome and well-being, several theoretical perspectives have argued for the idea that adjustment is heavily influenced by interactions between the individual and their context. For example, from an ecological perspective, children's development is better predicted by both micro-level systems such as the family, as well as larger macro-level systems including culture and society (Bronfenbrenner & Morris, 1998; Bronfenbrenner & Evans, 2000). Furthermore, goodness-of-fit models have argued convincingly that it is not individual characteristics, but the congruence between children's dispositions and parent's psychological and behavioral expectations that promotes adaptive psychological and social functioning (Lerner, 2002). These concepts have also been applied in a person-culture fit framework (Caldwell-Harris & Ayçiçeği, 2006; Kristof, 1996). Researchers from this framework argue that perceived or actual differences between the individual characteristics and cultural norms and values predicts greater difficulties in psychological adjustment, including increased depression, and anger (Ward & Searle, 1991), lower life satisfaction and more physical health problems (Chirkov, Lynch, & Niwa, 2005).

The concept of person–culture fit has been widely investigated by organizational psychologists, who have acknowledge that cultures have different values and patterns of behaviors; their work has repeatedly found that less concordance between the characteristics of an individual and his or her workplace culture is associated with poorer psychological outcomes (Kristof, 1996; Kristof-Brown, Zimmerman, & Johnson, 2005; O'Reilly, Chatman, & Caldwell, 1991). For example, the discrepancy between individual levels of extraversion and societal norms for extraverted behavior predict greater depressive symptoms (Ward & Chang, 1997). Comparable effects also have been found in studies investigating the impact of

individual differences in independent versus interdependent self-construal. For Asians living in the U.S. higher levels of independent self-construal predict better psychological adjustment (Oguri & Gudykunst, 2002) while higher scores on interdependent self-construals (incongruent with U.S. culture) lead to greater levels of perceived stress (Cross, 1995). Similarly, for students residing in a highly individualistic society, collectivism scores were positively correlated with depression, social anxiety, and obsessive-compulsive disorder. On the other hand, higher levels of individualism for students living in a collectivist culture was positively correlated with scales for paranoid, schizoid, narcissistic and antisocial personality disorder (Caldwell-Harris & Ayçiçeği, 2006).

With regards to emotions, the Asian cultural context differs from the European American cultural context in two important ways. First, in Asian cultures emotions are less consequential (Potter, 1988) and secondly, when considered, emotions of negative valence are valued (Suh, Diener, Oishi, Triandis, 1998). Collectivistic cultures have been suggested to have more rules for restricting the open experience and expression of emotions (Argyle, Henderson, Bond, Lizuka, & Contarello, 1986). Furthermore, whereas individuals from European American cultures believe that emotional expression is healthy and improves one's relationships with others, members of Chinese culture believe just the opposite (Potter, 1988; Russell & Yik, 1996; Zheng & Berry, 1991). In many Asian cultures the open display of emotion in social interaction is considered undesirable, and expressing one's feelings overtly is regarded as an admission of weakness (Cheung, Lau, & Waldman, 1980). Finally, individual emotions have little importance, as Suh and his colleagues write "when making global-self judgments, to attend exclusively to one's inner subjective experiences, while neglecting the relational and normal factors of a situation is both inappropriate and 'unnatural'" (Suh, Diener, Oishi, Triandis, 1998, p. 483).

Consistent with these perspectives, Suh and his colleagues have found that the experience of emotions is more strongly correlated with well-being in independent cultures. Specifically they asked 55,666 participants from 41 nations whether they have experience a series of 5 positive and 5 negative emotions in the past few weeks. Participants also rated their life satisfaction, and independent-collectivistic scores were obtained by leading researchers in the field. While across all nations, preponderance of positive emotions was positively correlated with higher levels of life satisfaction, the relations between experienced emotions and subjective well being was significantly stronger for independent cultures. These findings suggest that there was an emotional experiences are more important to one's experience of well-being in independent cultures.

Moreover, self-construals may also predict values and norms for experiencing emotion. Independent individuals have been demonstrated, for example, to be more promotion focus, and to emphasize positive information while undermining negative information regarding the self (Lee, Akaker, & Gardner, 2000). On the other hand, individuals characterized as interdependent are more likely to focus on negative information about the self as well as being more sensitive to violating social norms. Tugney & Fischer (1995) have also argued that in independent cultures emotions such as guilt, and shame are more highly valued because they indicate how one's controllable actions may be wrong. Indeed, evidence suggest that the Chinese consider negative emotions to be more useful and constructive than Americans (Sommers, 1984).

Consistent with these findings, in the context of socialization, there is evidence to suggest that while European American mothers are more likely to emphasize internal psychological states (Doan & Wang, in press), immigrant Chinese mothers are more likely to focus on overt behaviors. Moreover, in examining mother-child

conversations about past emotional events, Wang and her colleagues have found that American mothers are more likely to elicit children's opinions of their experiences, affirm their thoughts, opinions and emotions and to provide rich explanations for the antecedents of emotions (Wang, 2001; Fivush & Wang, 2005; Wang & Fivush, 2005). On the other hand, Chinese mothers are more likely to utilize an "emotion-criticizing style". Specifically, they do not focus on children's personal emotions and thoughts, but are more likely to focus on discussion of child's roles, appropriate behavior, and social expectations. Perhaps, as a consequence of these differences in socialization, some studies have found that immigrant Chinese children score lower than their European American peers in the ability to describe situations that would elicit emotions (Wang, 2003; Wang, et al., 2006). Earlier work has, interestingly, found however, that Chinese children are able to recognize negative emotions (e.g. sad) in facial expressions earlier than European American children (Borke, 1973). Borke argues that the cultural difference in the ability of Chinese children to recognize sad situations more accurately possibly reflects the emphasis within the Chinese culture on feeling "shameful" or "losing face." In sum, these cultural differences in emotional norms and values would likely influence how EK in children would relate to mental health.

The purposes of the current study

There is a host of theoretical and empirical evidence to suggest that the subjective meaning and valuation of emotion differ across cultures. In independent cultures like America, one's psychological states, feelings, and emotions serve as crucial pieces of information for understanding both the self and others. On the other hand, in interdependent cultures, emotions serve a less important role. Considerable research suggests that incongruence between individual characteristics and the characteristics of one's culture or environment can generate negative outcomes

(Caldwell-Harris & Ayçiçeği, 2006; Kristof, 1996; Lerner, 2002). Furthermore, the fit between individual characteristics and larger environment promotes positive development. These effects emerge across different definitions of culture (e.g., workplace, societal) and across different assessments of fit. However, the research on benefits of EK in children, have generally ignore the role that culture may play in moderating the relations between EK and children's mental health. In the current investigation, we argue that in cultural contexts moderates the role of emotion knowledge and children's internalizing problems. Specifically, children from European American culture would a negative relationship between EK and mental health, such that higher levels of EK would lead to lower levels of internalizing problems. Children, from interdependent cultures, however would not exhibit this positive relationship, but may in fact show opposite relations

Method

Participants. Thirty-four European American (M age = 7.27; females = 15) and 22 Immigrant Chinese participated in the study (M age =7.12 ; females = 11). Participants were recruited from a university town and suburban areas in upstate New York. The mean age was not significantly different across the two cultures. Children were recruited through local schools and by word of mouth, and were taking part in a larger longitudinal study of sociocognitive development across the preschool years. All children came from middle-class backgrounds, with the majority of the mothers (Chinese immigrant, 98%; European American, 93%) having obtained a college degree or beyond. Chinese immigrant families were originally from mainland China, Hong Kong and Taiwan, with the majority from mainland China (93%). Most (80%) of the children were born in the U.S.

Procedures. Two female researchers visited mothers and children in their homes. Chinese-English bilingual researchers visited the Chinese immigrant families. Before

commencing with children's interviews, the researchers established familiarity and rapport with the children by chatting about non-relevant events. All materials were written in both English and Chinese and translation and back-translation procedure was carried out to ensure their equivalence in both literal and sense meaning. Mothers were asked to engage the child in a series of free play and semi-structured tasks, followed by a researcher-child session. The entire home visit took approximately one and a half hours and was video tape-recorded. Only the tasks relevant to the current study are described here.

Emotion knowledge. EK was measured in the current study using an emotion judgment task adapted from Wang (2003a). In this task, the experimenter presented the child with 12 short stories, accompanied with pictures and narration, about emotion-eliciting situations with a story protagonist depicted as of the child's age, gender, and ethnicity. After each story presentation, she asked the child to select one out of four emotion faces (happy, sad, fearful, angry) that best showed how the protagonist felt in the story situation. The stories were presented in random order. The story themes were generalized by referring to previous research on children's EK and prototypical scripts of emotions and were familiar to both U.S. and Chinese children (e.g., Lewis, 1989; Stein & Liwag, 1997). They had been pretested and modified to ensure their age and cultural appropriateness (for more details, see Wang, 2003). Each researcher-child session lasted approximately 35 min and was video-recorded for later coding and analysis. At the end of the session, the children were presented with a small toy to thank them.

Children's social functioning. The child form of the BASC (ages 6-11) was used in this study. In addition to internalizing problems (whose subscales include anxiety, depression, somatization) because verbal ability, and externalizing problems have been associated with internalizing problems (Fine et al., 2003) and aspects of

externalizing problems (e.g., behavioral control) have been associated with EK (Schultz et al., 2001), we assessed functional communication, and externalizing problems, and included them in the multivariate analyses. On the child form of the BASC, parents rate 138 symptoms. Symptoms are rated on a 4-point scale of frequency (never = 0, sometimes = 1, often = 2, and almost always = 3). The BASC has established psychometric properties for use with children of diverse ethnic backgrounds (Reynolds & Kamphaus, 1998). For our study sample, internal consistency (Cronbach's alpha) ranged from .83 to .92 for the broad-band scales. Inter-correlations among BASC scales were in the expected directions, with positive associations among problem scales and negative associations between problem scales and adaptive skills.

Results

Table 1 presents the means and standard deviations for all variables across the two cultural groups. The range for the children's EK was zero to eleven.

Table 3.1 Means and Standard Deviations of Mother and Child Variables by Culture

	Chinese Immigrant		European American	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Age (months)	7.12	.397	7.26	.246
Functional Communication	33.87	2.96	33.05	2.57
Externalizing problems	60.15	6.93	57.00	4.54
Emotion understanding	6.91	2.52	7.61	1.68
Internalizing problems	73.50	6.85	73.00	5.80

There was no significant cultural difference in age, EK and functional communication. EA children scored marginally higher in externalizing problems as compared to their immigrant Chinese peers. Next bivariate correlations were ran for each cultural group. Table 2 presents the correlations for all study variables as a function of ethnic group. As expected externalizing was significantly, and positively associated with internalizing problems for both groups. Gender was marginally associated with

externalizing problems. EK was negatively associated with internalizing problems among EA children.

Relations between children's EK and internalizing problems.

Before conducting our regression analyses, to reduce multicollinearity and to ease interpretation, all control variables, main effects and interaction terms were standardized (Aiken & West, 1991). In order to determine the relations between children's EK scores and their internalizing problems independent of demographic variables such as culture and gender, as well as verbal ability and externalizing problems, we ran a series of hierarchical regression analyses. Table 3.3 summarizes the results of the regression analyses.

Table 3.3 *Regression predicting children's internalizing problems*

	R	R ² Change	Final Model B
<i>Model 1</i>	.107	.011	
1. Culture			.722
2. Gender			-2.652 ⁺
<i>Model 2</i>	.454	.194**	
3. Functional Communication			.126
4. Externalizing problems			.441**
<i>Model 3</i>	.454	.001	
7. EK ^a			-2.98*
<i>Model 4</i>	.581	.131**	
8. EKxCulture			5.988**

Note. ^aEK= Emotion knowledge, European American and females were set as the reference group. * $p < .05$; ** $p < .01$, *** $p < .001$.

In the first model, we entered culture and gender in the first block. These two variables did not contribute significantly to the R square change. Next, children's functional communication, and externalizing problems were entered in the second block, these variables explained 47% of the variance, $F(2, 50) = 6.876, p = .012$. In the third block children's EK was entered. The main effect of EK was not significant, nor did it increase the variance explained. Finally, in the last block the EK by Culture interaction was entered into the model. The culture by interaction term was significant,

$b = 5.97$, $t(48) = 5.9666$, $p = .002$. Furthermore, there was a main effect of externalizing problems $b = .486$, $t(48) = 3.92$, $p < .001$, children's EK, $b = -3.049$, $t(48) = -3.05$, $p = .011$, and gender $b = -3.46$, $t(48) = -2.287$, $p = .027$. The final model contributed to 60 percent of the variance explained in children's internalizing problems; the overall model was highly significant $F(6, 48) = 4.57$, $p = .001$. The significance of the EK by culture interaction suggest that the effects of EK on internalizing problems differs as a function of culture. To test whether within each culture, if the relationship between EK and children's internalizing problems, was significantly different from zero, we ran a simple slopes analysis. Results suggested that for EA children, EK was negatively associated with children's internalizing problems, $b = -2.84$, $t(49) = -2.39$, $p = .02$. For immigrant Chinese children, EK was positively associated with children's internalizing problems, this effect was marginally significant, $b = 1.47$, $t(49) = 1.52$, $p = .11$.

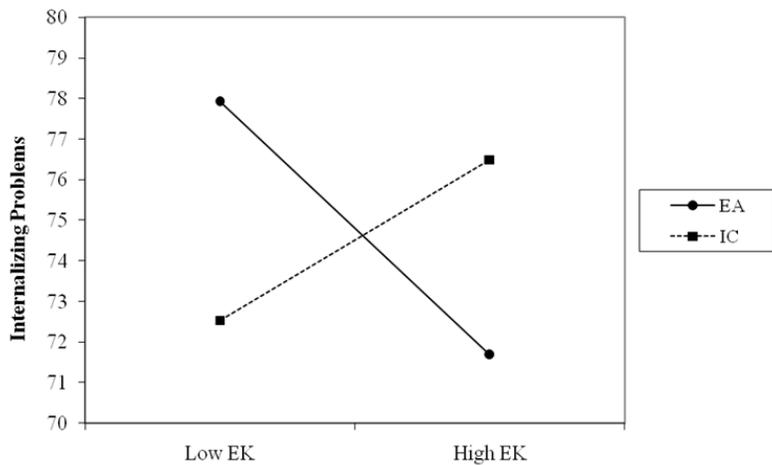


Figure 3.1 *The relationship between EK and children's internalizing problems as a function of culture.*

Discussion

To the best of our knowledge, this is the first study to demonstrate that culture

moderates relationship between children's EK and subsequent internalizing problems. We demonstrate that after controlling for verbal ability, and children's externalizing problems, children with higher levels of emotion understanding had lower levels of internalizing problems. However, this relationship only held true for European American children. For immigrant Chinese children, EA was not predictive of adjustment. This finding has important implications for both policy and research. Norms regarding displays and regulation of emotions, self-expression, and the role of the self in relation to others differs across cultures (Markus & Kitayama, 1991; Han, Leichtman, & Wang, 1998). These variations interact with individual characteristics to influence the relations between EK and adjustment .

Our results are consistent with past research which demonstrate that in European American children higher levels of emotion knowledge leads to better adjustment, while low levels of regulatory abilities manifested as externalizing behaviors also was predictive of increased reports of children's internalizing problems (Fine et al., 2003; Schultz et al., 2001). In EA cultures, emotions are often considered as more relevant to the self, and well being (Suh et al., 1998), and one's own personal feelings or opinions are indicative of both social relations (Potter, 1998) and the "true self" (Andersen, 1984). In EA culture, the individual self is valued, thus parents may accept, nurture, and validate children's emotional expressions, preferences and wishes. Children who have higher levels of EK may be better at negotiating interactions with others as well, as having their emotional needs met. Thus, consistent with good-of-fit models, emotion knowledge was found to be beneficial for EA children but not immigrant Chinese children.

In interdependent cultures children with high levels of EK may feel a lack of synchrony between their understanding of the self and the larger cultural norm. Additionally, high levels of emotion knowledge make them too focus on the

psychological self -- internal states and feelings -- rather than paying attention to cultural norms and values. This focus on the self, may cause difficulties with social interactions among interdependent others, as well as cause more psychological dissonance in terms of what is valued (e.g. one's own preferences, emotions and desires) and what should be valued (e.g. the culture's norms and values).

Furthermore, because negative emotions such as guilt and shame are valued in Asian cultures (Eid & Diener, 2001; Sommers, 1984), understanding emotions in this case may not be conducive for children from interdependent cultures since living in an independent society that values self-esteem and self-promotion. Asian parents often use an "emotion-criticizing" style that focuses on using negative experiences to instruct proper behavior and moral attitudes (Wang, 2001). Additionally, since the valuing of internal aspects of the self, lead to the belief that internal feelings should become the basis for self-judgments (Suh, et al., 1998), children with higher EK may be more sensitive to the emotional meaning of criticism and shame, which are prevalent in Asian cultures, leading to greater levels of anxiety and depression. This would be consistent with work demonstrating that high levels of social cognition (including both theory of mind and emotion understanding) was correlated with more sensitivity to teacher criticism (Cutting & Dunn, 2002).

Several limitations to the current research must be acknowledge, first we did not measure children's behavioral problems at Time 1, thus was unable to assess *changes* in children's behavioral problems as a function of emotion knowledge. Future studies examining longitudinal trajectories of children's behavioral problems, would provide better support for causation. Additionally, based on theoretical and empirical perspectives, we argued that European American and immigrant Chinese differ on specific dimensions such as the valuing of emotions, and the role of the self, however we did not measure these variables per se. These dimensions vary between

and within cultures. Thus an important line of future research would be to assess whether EK would be predictive of outcomes, between families, within the same culture. Finally, we think it would be important to measure immigrant children's adjustment as they develop and the context for their development expands to include peers and schools. For example, would the immigrant Chinese children begin to demonstrate the benefits of EK, as their developmental context began to incorporate more elements of an independent culture? Would their European American friends, and teachers, report them as more popular and sociable?

Despite these limitations, findings in the current study have important implications for both theory and practice. Our data suggests the importance of considering individual development within the larger cultural society, rather than in isolation. The academic success of Asian immigrants and the perpetuation of the "model minority" myth has rendered the psychological problems of Asian immigrants mostly invisible (Qin, Way & Mukherjee, 2008). Behavioral competence, is not necessarily paralleled by superior adjustment in all spheres of functioning, including freedom from anxiety, distress and other internalizing states (Luthar and Zigler, 1991). While most studies on internalizing problems have focused exclusively on European Americans (Zahn-Waxler, Dougan & Slattery, 2000), there is substantial evidence to show that Asian immigrants children and adolescents, report lower self-esteem (Rhee, Chang, & Rhee, 2003), increased problematic peer relations (Greene, Way, & Pahl, 2006; Qin, Way, & Mukherjee, 2008; Qin, Way, & Rana, 2008), as well as more pessimism, depression and social withdrawal (Chang, 1996). Furthermore, in a nationally representative sample, as compared to other ethnic groups, immigrant Asian students report significantly decreased levels of social support across the adolescent years (Doan & Fuller-Rowell, in prep). Asian American women have higher rates of contemplated suicide as compared to national estimates (Duldulao, Takeuchi, & Hong,

2009) and while Asian American students show less delinquent behavior and perform well academically, they are more likely to exhibit anxiety, internalized social problems, report more isolation and less social support than their Caucasian peers (Lorenzo, Pakiz, Reinharz, & Forst, 1995).

As intervention research designed to improve EK in children are implemented, our data suggests that it is critical for both researchers and clinicians alike to be sensitive to issues of cultural diversity and consider the importance of person-culture fit. Emotional intelligence in Asian cultures may manifest differently, such that individual feelings should be considered with less weight, while awareness and sensitivity to social norms and cultural values may play more important roles in influencing the quality of social interactions and hence adjustment. Furthermore, we believe it is important to acknowledge that immigrant children are striding two cultures, thus perhaps the best intervention approach may be one that encourages children to foster multiple-emotional intelligences in the context of bi-cultural competencies, which would allow them to be successful in multiple settings and context.

REFERENCES

- Achenbach, T.M. (1991). *Manual for Teacher's Report Form and 1991 Profile*. Burlington, VT: Department of Psychiatry. University of Vermont.
- Aiken, L. & West, S. (1991). *Multiple regression: Testing and interpreting interactions*. Los Angeles: Sage.
- Andersen, S. M. (1984). Self-knowledge and social inference: II. The diagnosticity of cognitive/affective and behavioral data. *Journal of Personality and Social Psychology, 46*, 294-307.
- Andersen, S. M., & Ross, L. (1984). Self-knowledge and social inference: I. The impact of cognitive/affective and behavioral data. *Journal of Personality and Social Psychology, 46*, 280-293.
- Batson, C. D., Turk, C. L., Shaw, L. L., & Klein, T. R. (1995). Information function of empathic emotion: Learning that we value the other's welfare. *Journal of Personality and Social Psychology, 68*, 300—313.
- Borke, H. (1973). The development of empathy in Chinese and American children between three and six years of age: A cross culture study. *Developmental Psychology, 9*, 102-108.
- Caldwell-Harris, C. & Ayçiçeği, A. (2006). When personality and culture clash: The psychological distress of allocentrics in an individualistic culture and idiocentrics in a collectivist culture. *Transpersonal Psychiatry, 43*, 331-361.
- Chang, E.C. (1996). Cultural differences in optimism, pessimism, and coping: Predictors of subsequent adjustment in Asian American and Caucasian American college students. *Journal of Counseling Psychology, 43*, 113-123.
- Cicchetti, D., Ackerman, B.P., & Izard, C.E. (1995). Emotions and emotion regulation in developmental psychology. *Development and Psychopathology, 7*, 1-10.

- Clore, G. L., & Parrott, W. G. (1994). Cognitive feelings and metacognitive judgments. *European Journal of Social Psychology, 24*, 101 — 115.
- Clore, G. L., Schwarz, N., & Conway, M. (1994). Affective causes and consequences of social information processing. In R. S. Wyer & T. K. Srull (Eds.), *Handbook of social cognition* (Vol. 1, pp. 323-417). Hillsdale, NJ: Erlbaum.
- Cross, S.E. (1995). Self-construals, coping and stress in cross-cultural adaptation. *Journal of Cross-Cultural Psychology, 26*, 673-697.
- Cutting, A.L. & Dunn, J. (2002). The cost of understanding other people: social cognition predicts young children's sensitivity to criticism. *Journal of Child Psychology and Psychiatry, 43*, 7, 849-860.
- Dadds, M.R., Sanders, M.R., Morrison, M., & Rebetz, M. (1992). Childhood depression and conduct disorder: II. An analysis of family interaction patterns in the home. *Journal of Abnormal Psychology, 101*, 505-513.
- Denham, S.A. (1986). Social cognition, pro-social behavior, and emotion in preschoolers: Contextual validation. *Child Development, 57*, 194-201.
- Denham, S.A. (2007). Dealing with feelings: How children negotiate the worlds of emotions and social relationships. *Cognition, Brain, Behavior, 9*, 1-48.
- Denham, S.A. & Couchoud, E.A. (1991). Socioemotional predictors of preschoolers' responses to adult negative emotion. *Journal of Child Psychology & Psychiatry, 32*, 595-608.
- Denham, S.A. McKinley, M., Couchoud, E.A. & Holt, R. (1990). Emotional and behavioral predictors of preschool peer ratings. *Child Development, 61*, 1145-1152.
- Denham, S.A. Blair, K.A. Schmidt, M.S. & Demulder, E. (2002). Compromised emotional competence: Seeds of violence sown early? *American Journal of Orthopsychiatry, 72*, 70-82.

- Denham, S.A. Workman, E., Cole, P.M., Weissbrod, C., Kensora, K.T. & Zahn-Waxler, C. (2000). Prediction of externalizing behavior problems from early to middle childhood: The role of parental socialization and emotion expression. *Development and Psychopathology*, 12, 23-45.
- Doan, S.N. & Fuller-Rowell, T.E. (in prep). Changes in social support: A longitudinal investigation of Whites and Asians from immigrant and non-immigrant families.
- Doan, S. N., & Wang, Q. (in press). Maternal discussions of mental states and behaviors: Relations to emotion situation knowledge in European American and immigrant Chinese children. *Child Development*.
- Dunn, J. & Brown, J. R. (1994). Affect expression in the family, children's understanding of emotions, and their interaction with others. *Merrill-Palmer Quarterly*, 40, 120-137.
- Dunn, J. Brown, J. R. & Mcguire, M. (1995). The development of children's moral sensibility: Individual differences and emotion understanding. *Developmental Psychology*, 27, 448-455.
- Duldulao, A.A., Takeuchi, D.T., & Hong, S. (2009). Correlates of suicidal behaviors among Asian Americans. *Archives of Suicide Research*, 13, 277-290.
- Eid, M., & Diener, E. (2001). Norms for experiencing emotions in different cultures: Inter- and intra-national differences. *Journal of Personality and Social Psychology*, 81, 869-885.
- Fine, S. Izard, C. Mostow, A. Trentacosta, C. & Ackerman, B. (2003). First grade emotion knowledge as a predictor of fifth grade self-reported internalizing behaviors from economically disadvantaged families. *Development and Psychopathology*, 15, 331-342.

- Fiske, A. R., Kitayama, S., Markus, H. R., & Nisbett, R. E. (1998). The social matrix of social psychology. In D. Gilbert et al. (Eds.), *Handbook of Social Psychology*. NY: McGraw Hill. (pp. 915-981)
- Fivush, R. & Wang, Q. (2005). Emotion talk in mother-child conversations of the shared past: The effects of culture, gender, and event valence. *Journal of Cognition and Development*, 6, 4, 489-506.
- Geertz, C. (1984). "From the native's point of view": On the nature of anthropological understanding. In R. A. Shweder & R. A. LeVine (Eds.), *Culture theory: Essays on mind, self, and emotion* (pp. 123— 136). Cambridge, England: Cambridge University Press.
- Greene, M. L., Way, N., & Pahl, K. (2006). Trajectories of perceived adult and peer discrimination among Black, Latino, and Asian American Adolescents: Patterns and psychological correlates. *Developmental Psychology*, 42(2), 218-238.
- Han, J. J., Leichtman, M. D. & Wang, Q. (1998). Autobiographical memory in Korean, Chinese, and American children. *Developmental Psychology*, 34, 4, 701-713.
- Izard, C.E. (2001). Emotional intelligence or adaptive emotions. *Emotion*, 1, 249-257.
- Izard, C.E., King, K.A., Trentacosta, C.J. Laurenceau, J.P., Morgan, J.K., Krauthamer-Ewing, E.S., et al. (2008). Accelerating the development of emotion competence in Head Start children: Effects on adaptive and maladaptive behavior. *Development and Psychopathology*, 20, 369-397.
- Kashima, Y, Siegal, M., Tanaka, K., & Kashima, E. S. (1992). Do people believe behaviours are consistent with attitudes? Towards a cultural psychology of attribution processes. *British Journal of Social Psychology*, 31, 111-124.

- Kendall, P.C. Aschenbrand, S.G. & Hudson, J.L. (2003). Child-focused treatment of anxiety. In A.E. Kazdin, & J.R. Weisz (Eds.), *Evidence-based psychotherapies for children and adolescents* (pp. 81-100). New York: The Guildford Press.
- Kristof, A.L. (1996). Person-organization fit: An integrative review of its conceptualizations, measurement and implications. *Personnel Psychology*, 1996, 49, 1-49.
- Kristof-Brown, A.L., Zimmerman, R.D. and Johnson, E.C. (2005) Consequences of individuals' fit at work: A meta-analysis of person–job, person–organization, person– group, and person–supervisor fit. *Personnel Psychology*, **58**, 281-342.
- Leaner, R. (2002). Concepts and theories of human development, 3rd ed. Lawrence Earlbaum: New Jersey.
- Lee, A. Y., Aaker, J. L., & Gardner, W. L. (2000). The pleasures and pains of distinct self-construals: The role of interdependence in regulatory focus. *Journal of Personality and Social Psychology*, 78, 1122–1134.
- Lewis, M. (1989). Cultural differences in children's knowledge of emotional scripts. In C. Saarni & P. L. Harris (Eds.), *Children's understanding of emotion* (pp. 350–374). New York: Cambridge University Press.
- Lorenzo, M.K., Pakiz, B., Reinherx, H. & Frost, A. (1995). Emotional and behavioral problems of Asian American adolescents: A comparative study. *Child and Adolescent Social Work Journal*, 12, 197-212.
- Luthar, S. S. & Zigler E. (1991). Vulnerability and competence: a review of research on resilience in childhood. *The American journal of Orthopsychiatry*, 61, 6-22.
- Mayer, J.D. & Salovey, P. (1997). What is emotional intelligence? In P. Salovey, & D. Sluyter (Eds.), *Emotional development and emotional intelligence: Implications for educators* (pp. 3-31). New York: Basic.

- Markus, H., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review*, 98, 224-253.
- Oguri, M., & Gudykunst, W. B. (2002). The influence of self construals and communication styles on sojourners' psychological and sociocultural adjustment. *International Journal of Intercultural Relations*, 26, 577-593.
- O'Reilly, C., Chatman, J. & Caldwell, D. (1991). People and organizational culture: A Q-sort approach to assessing fit. *Academy of Management Journal*, 34: 487-516.
- Potter, S. H. (1988). The cultural construction of emotion in rural Chinese social life. *Ethos*, 16, 181-208.
- Qin, D.B., Way, N., & Mukherjee, P. (2008). The other side of the model minority story: The familial and peer challenges faced by Chinese American adolescents. *Youth & Society*, 39, 480-506.
- Qin, D.B., Way, N., & Rana, M. (2008). Understanding psychological and social adjustment of Chinese American adolescents at school. *New Directions for Child and Adolescent Development*, 121, 27-42.
- Rhee, S., Chang, J., & Rhee, J. (2003). Acculturation, communication patterns, and self-esteem among Asian and Caucasian American adolescents. *Adolescence*, 3, 749-768.
- Schwarz, N., & Clore, G. L. (1983). Mood, misattributions, and judgments of well-being: Informative and directive functions of affective states. *Journal of Personality and Social Psychology*, 45, 513-523.
- Schwarz, N. (1990). Feelings as information: Informational and motivational functions of affective states. In E. T. Higgins & R. Sorrentino (Eds.), *Handbook of motivation and cognition: Foundations of social behavior* (Vol. 2, pp. 527-561). New York: Guilford Press.

- Schwarz, N., & Clore, G. L. (1988). How do I feel about it? Informative functions of affective states. In K. Fiedler & J. Forgas (Eds.), *Affect, cognitions, and social behavior* (pp. 44-62). Toronto, Ontario, Canada: Hogrefe.
- Saarni, C. (1999). *The development of emotional competence*. New York: The Guilford Press.
- Sommers, S. (1984). Adults evaluating their emotions: A cross-cultural perspective. In C. Z. Malatesta & C. Izard (Eds.), *Emotions in adult development* (pp. 319–338). Beverly Hills, CA: Sage.
- Stein, N. L., & Liwag, M. D. (1997). Children's understanding, evaluation, and memory for emotional events. In P. W. van den Broek, P. J. Bauer, & T. Bourg (Eds.), *Developmental spans in event comprehension and representation* (pp. 199–235). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.
- Suh, E. M., Diener, E., Oishi, S., & Triandis, H. (1998). The shifting basis of life satisfaction judgments across cultures: Emotions versus norms. *Journal of Personality and Social Psychology*, *74*, 482–493.
- Triandis, H. C. (1989). Self and social behavior in differing cultural contexts. *Psychological Review*, *96*, 269-289.
- Wang, Q. (2001). "Did you have fun?": American and Chinese mother-child conversations about shared emotional experiences. *Cognitive Development*, *16*, 693-715.
- Wang, Q. (2003). Emotion situation knowledge in American and Chinese preschool children and adults. *Cognition & Emotion*, *17*, 725–746.
- Wang, Q. & Fivush, R. (2005). Mother-child conversations of emotionally salient events: Exploring the functions of emotional reminiscing in European American and Chinese Families. *Social Development*, *14*, 3, 473-495.

- Wang, Q., Leichtman, M. D., & Davies, K. I. (2000). Sharing memories and telling stories:
American and Chinese mothers and their 3-year-olds. *Memory*, 8, 3, 159-177.
- Wang, Q., Hutt, R., Kulkofsky, S., McDermott, M., & Wei, R. (2006). Emotion situation knowledge and autobiographical memory in Chinese, immigrant Chinese, and European American 3-year-olds. *Journal of Cognition and Development*, 7, 1, 95-118.
- Ward, S. Bochner, A. Furnham (2001), "The psychology of culture shock", Routledge: Hove, UK.
- Ward, C. & Chang, W. (1997). "'Cultural fit': A new perspective on personality and sojourner adjustment." *International Journal of Intercultural Relations*, 21, 525 - 533.
- Zahn-Waxler, C. Klimes-Dougan, B. & Slattery, M. (2000). Internalizing problems of childhood and adolescence: Prospects, pitfalls, and progress in understanding the development of anxiety and depression. *Development and Psychopathology*, 12, 443-466.